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AIR FORCE PARTICIPATION IN JOINT ARMY-AIR FORCE TRAINING EXERCISES, 1951-1954

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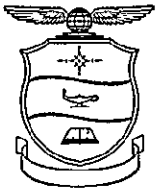
By
Dr. Ralph D. Bald



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FOREWORD

During the years 1951-1954 a considerable part of the training carried on jointly by Tactical Air Command and Army Field Forces was concentrated in five field exercises--SOUTHERN PINE, SNOW FALL, LONG HORN, COLD SPOT, and TACAIR 54-7. Of these, the first three were joint exercises, and the last two--COLD SPOT and TACAIR 54-7--were unilateral Air Force exercises held in conjunction with Army exercises SNOW STORM and FLASH BURN, respectively.

For each of the five exercises this study provides a narrative of the planning and operational phases and an analysis of results or findings. Special emphasis is placed on findings relative to planning, command relationships, reconnaissance, close support, troop-carrier operations, communications, and atomic weapons play. In the concluding chapter attention is focused on deficiencies that have particular significance because of their appearance in several or all of the exercises.

The present study is a sequel to two earlier USAF Historical Division studies on joint training exercises: USAF Historical Studies: No. 80, Air Force Participation in Joint Army-Air Force Training Exercises, 1947-1950 and USAF Historical Studies: No. 94, Air Force Participation in Joint Amphibious Training Exercises, 1946-1950.

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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 1

EXERCISE SOUTHERN PINE–PLANS AND OPERATIONS

Background

Extensive commitments by the Air Force and the Army in Korea interrupted the joint training programs that had been carried on since the close of World War II and forced the cancellation of a number of joint exercises scheduled for the latter part of 1950 and the first half of 1951. By late 1950, however, it was possible for the two services to begin planning for Exercise SOUTHERN PINE, which was to be conducted in the Fort Bragg-Camp Mackall area of North Carolina in the summer of 1951.

Exercise SOUTHERN PINE was officially ordered in a joint directive published on 24 January 1951 by Chief of Army Field Forces and Commanding General, Tactical Air Command. Original plans called for the exercise to be conducted in May and June 1951; but because of delays—changes in troop lists, withdrawal of contemplated Navy participants, and a shortage of Army umpires and signal personnel and equipment—the dates of the exercise were moved forward to 6-27 August.[1]

As stated in the joint directive the purposes of the exercise were to provide training for Army and Air Force units in large-scale offensive and defensive operations with emphasis on night operations and training in close tactical air support; airborne operations; rail, motor, and air movements; and logistical support, to include aerial supply. It was expected also that the exercise would afford Army and Air Force headquarters practical planning and operational experience in joint staff planning and operations. An additional objective was the development and testing of Army, Air Force, and joint doctrine, tactics, and techniques, including those set forth in the Joint Training Directive for Air-Ground Operations.[2]

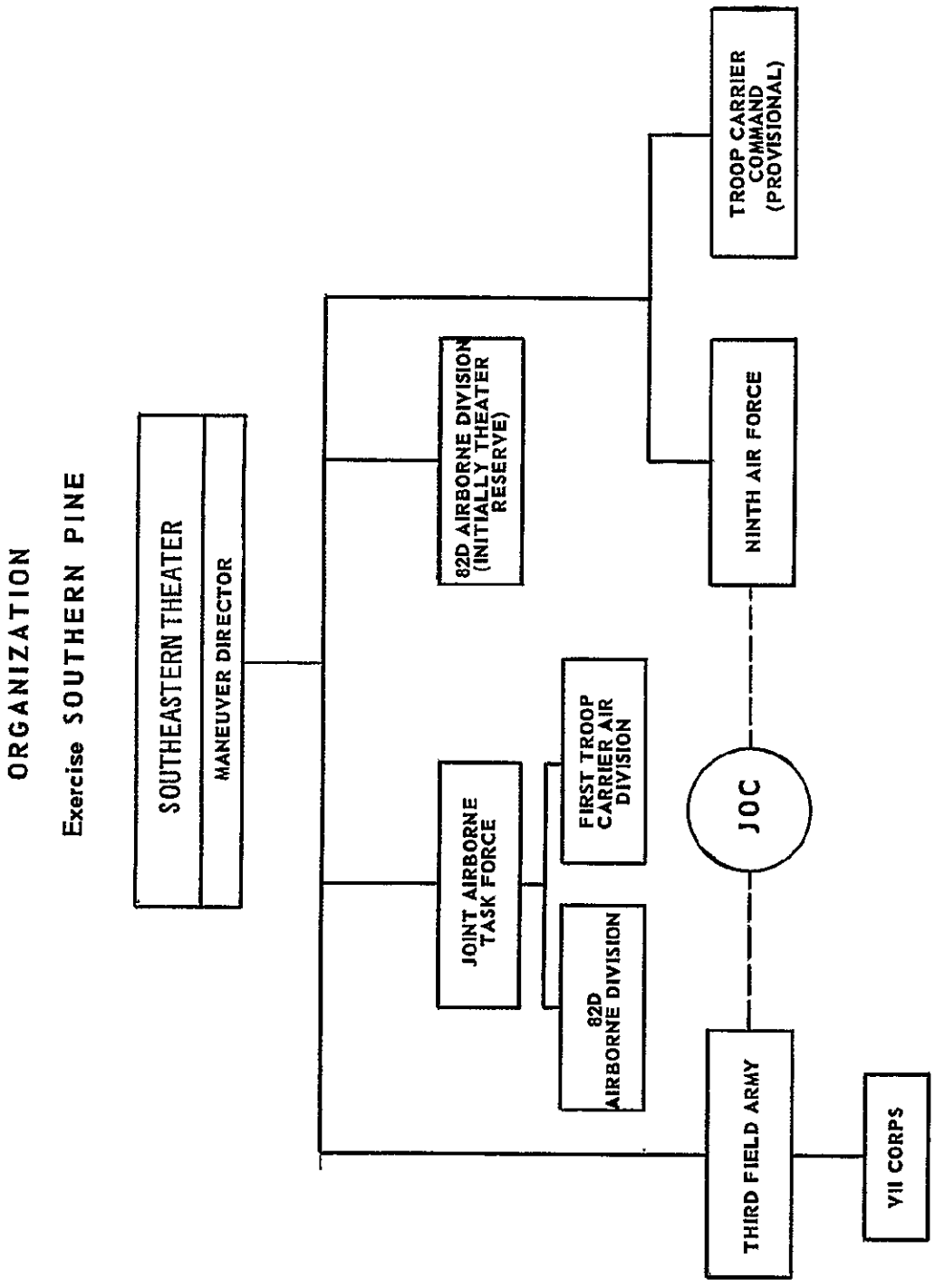
Planning

Preliminary joint planning for Exercise SOUTHERN PINE was accomplished at an Air Force-Army conference held at Fort McPherson, Georgia, in November 1950. At this meeting tentative Air Force and Army troop lists were made up, and a scenario of the exercise was prepared.[3] After the issuance of the joint directive of 24 January, joint planning was carried out at Fort Bragg, North Carolina, by a joint maneuver staff, manned by approximately equal numbers of Army and Air Force personnel. The joint staff sections were filled during the period 25 January-15 March, with Ninth Air Force providing the Air Force members.[4]

On 25 January joint planning by the maneuver staff got underway when the assistant chief of staff J-3 called a conference with the assistant chiefs of staff J-1, J-2, and J-4 to determine the basic documents that should be published by the maneuver director. Their recommendation, which was approved on the following day by the maneuver director, was that a general plan, a Southeastern Theater operation plan and a Third Field Army operation plan, supplemented by numbered maneuver memoranda and letters of instruction, would be the media through which the exercise would be initiated and controlled. The directives that coordinated the planning were published as staff memoranda.[5]

The general plan was published on 1 March and the remaining annexes and appendixes plus changes were issued as planning was completed or as needed. On 7 August formal changes to the plan were discontinued, and all subsequent directives, which normally would have been included in the plan, were issued by teletype.[6]

CHART 1



Southeastern Theater Operation Plan 1-51 was developed concurrently with the general plan and was published on 25 May. The Third Field Army operation plan, begun on 20 April, was issued on 25 June.[7]

Tactical Air Command handled overall Air Force planning for the exercise, and the plans division of Ninth Air Force drew up the detailed plans. Ninth Air Force planning began on 29 January upon receipt of the joint directive, and on 1 July the Ninth published its Operations Plan 6-51. Ninth Air Force also assumed responsibility for the administrative and logistical support of all USAF units taking part in the exercise and issued Administrative Plan 2-51 on 10 May.[8]

Organization and Command Structure

Exercise SOUTHERN PINE was organized as a theater operation with Ninth Air Force and Third Field Army as the major components of Southeastern Theater.* Troop Carrier Command (Provisional) was established at the same level of command as Ninth Air Force and Third Field Army. For the conduct of airborne operations the 1st Troop Carrier Air Division, a unit of Troop Carrier Command (Prov), was joined with the 82d Airborne Division to form a joint airborne task force (JATF), directly under the theater commander.[9]

The command structure was somewhat artificial; maneuver director headquarters served also as Southeastern Theater headquarters, and Army personnel of the maneuver director's staff served not only on the theater headquarters staff but also as the staff for Third Field Army headquarters. Third Field Army headquarters was largely a paper organization, and it did not actually operate in the field. Ninth Air Force headquarters, on the other hand, was fully staffed and was actually operational in the field. Headquarters, JATF, was manned from the JATF's major components, the 82d Airborne Division and 1st Troop Carrier Air Division. Headquarters, XV Corps Artillery played the part of headquarters, Aggressor army forces; Aggressor air force headquarters was composed of personnel obtained from various Ninth Air Force units.[10]

Lt. Gen. J R. Hodge, Commanding General, Third Army, served as maneuver director and Southeastern Theater commander. The deputy maneuver director was Maj. Gen. W. R. Wolfinbarger, Commanding General, Ninth Air Force. The deputy commanding general of Ninth Air Force, Brig. Gen. E. K. Warburton, acted as the Ninth's commander in the field. Col. H. L. Prindle, commander of the 314th Troop Carrier Wing, headed Troop Carrier Command (Prov), and Maj. Gen. T. F. Hickey, Commanding General, 82d Airborne Division, led the JATF, with Colonel Prindle acting as deputy and also as commander of 1st Troop Carrier Air Division.[11]

Participating Units

Friendly air units included the 123d Fighter-Bomber Wing (two squadrons), the 117th Tactical Reconnaissance Wing (three squadrons), the 85th Bombardment Squadron, the 507th Tactical Control Group, the 933d Signal Battalion, and numerous small communication, medical, and supply units. Troop-carrier operations were conducted by the 314th, 434th, 435th, 443d, and 516th Troop Carrier Wings.† Each wing, except for the 314th, furnished a group headquarters and elements of three squadrons; the 314th Wing was composed of elements of two squadrons plus a detachment from the 375th Troop Carrier Wing.[12]

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*See Chart 1.

†The 434th, 435th, 443d, and 516th Troop Carrier Wings were each equipped with 24 C-46 aircraft. The 314th Wing was equipped with 17 C-119's, 5 C-82's, and 5 C-122's.

Aggressor air consisted of the 20th Fighter-Bomber Wing (one squadron), the 137th Fighter-Bomber Wing (two squadrons), the 140th Fighter-Bomber Wing (one squadron),* a detachment from the 363d Tactical Reconnaissance Wing, and several small communication detachments.†[13]

The major friendly ground units were the 82d Airborne Division (minus one regiment) and the recently federalized 28th and 43d Infantry Divisions. The role of Aggressor was played by the 1st and 2d Battalions of the 82d Airborne Division's 325th Airborne Infantry Regiment (AIR) and the 511th AIR of the 11th Airborne Division.[14]

Exercise Bases

During the exercise all troop-carrier units and the 123d Fighter-Bomber Wing operated from Laurinburg-Maxton Airfield,†† North Carolina, and the 117th Tactical Reconnaissance Wing was based at Pope AFB, North Carolina. The 85th Bombardment Squadron flew exercise missions from its home base, Langley AFB, Virginia. Aggressor air's 137th and 140th Fighter-Bomber Wings were located at New Hanover County Airport, North Carolina. Based at their home station, Shaw AFB, South Carolina, were the Aggressor's 20th Fighter-Bomber Wing and 363d Tactical Reconnaissance Wing.[15]

Air Force units moved to their maneuver bases during the latter part of July and the first part of August, with the troop-carrier wings arriving on 21 July and the fighter-bomber, bombardment, and reconnaissance units arriving during the first week of August.[16]

From 1-12 August, the major friendly ground units moved into the exercise area. The Aggressor's 511th AIR and one battalion of the 325th AIR arrived during the period 3-18 July; the other battalion of the 325th, which was added to the troop list at a late date, reached its maneuver station on 12 August.[17]

Pre-Exercise Training

From 6 through 12 August a pre-exercise training program was conducted to orient tactical air units on the general maneuver area and to train tactical air control center (TACC) and tactical air direction post (TADP) personnel and tactical air units in ground-controlled interception (GCI) operations, air defense procedure, and procedures for furnishing close air support to ground units. During the period 6-8 August GCI was stressed, and from 9 through 11 August emphasis was shifted to close-support training. A command post exercise was held for the purpose of orienting joint operations center (JOC) personnel.[18]

In the latter part of July troop-carrier units at Maxton Air Base engaged in intensive training, which included preparation for mass formation paradrops, development of individual aircrew proficiency, and operation of helicopters and C-122 assault-type aircraft. On 30-31 July Troop Carrier Command (Prov) and the 82d Airborne Division conducted a rehearsal for the airborne phase of the exercise. Infantry drops and heavy drops, made by C-46 and C-119 aircraft, used as nearly as possible the routes, checkpoints, and drop zones to be employed in the airborne assault phase of the maneuver. C-122 assault aircraft airlanded personnel and heavy equipment and evacuated casualties.[19]

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*On 22 August, when air superiority passed from the Aggressor to U.S. forces, the squadrons from the 137th and 140th Wings became a part of friendly air.

†Ninth Air Force units were equipped with the following numbers and types of aircraft:

123d Fighter-Bomber Wing	57 F-51's
137th Fighter-Bomber Wing	24 F-84's
140th Fighter-Bomber Wing	20 F-51's
20th Fighter-Bomber Wing	17 F-84's
85th Bombardment Squadron	10 B-45's
117th Tactical Reconnaissance Wing	18 RF-80's; 12 B-26's; 6 RB-26's
363d Tactical Reconnaissance Wing	6 RF-80's

††Designated Maxton Air Base for the exercise.

Meanwhile, Aggressor forces were also engaged in pre-exercise training. Early in August these forces held a nine-day rehearsal of the entire exercise on the same terrain that was to be used during the maneuver. During this rehearsal the Aggressor joint operations center and tactical air units conducted preplanned and immediate close-support and reconnaissance operations.[20]

Play of the Problem

The hypothetical situation established as a basis for the play of the exercise was a continuation of the background used for several maneuvers held since 1946. It was assumed that the United States was at war with an aggressor nation that was in control of Europe and the Caribbean area. Beginning in 1946 the Aggressor made several attempts to gain a foothold on continental United States. He succeeded in taking Florida and the St. Lawrence Valley and in 1950 established a beachhead on the Atlantic seacoast. This beachhead was later reduced, but in July 1951 the Aggressor made a successful amphibious assault on the South Carolina coast, seizing a beachhead extending from Myrtle Beach to Charleston.[21]

By 3 August the Aggressor had captured and consolidated an area in South Carolina extending through Myrtle Beach, Aynor, Marion, Florence, and Sumter. On 3 August Aggressor paratroops were dropped in North Carolina in the vicinity of Camp Mackall, Hoffman, Hamlet, Laurinburg, and Maxton. These troops linked up with Aggressor ground forces on 5 August, and shortly thereafter Aggressor armored thrusts reached the western boundary of Fort Bragg. Here the Aggressor concentrated most of his armored forces and prepared for an attack on the next objectives, the industrial centers of Raleigh and Durham.[22]

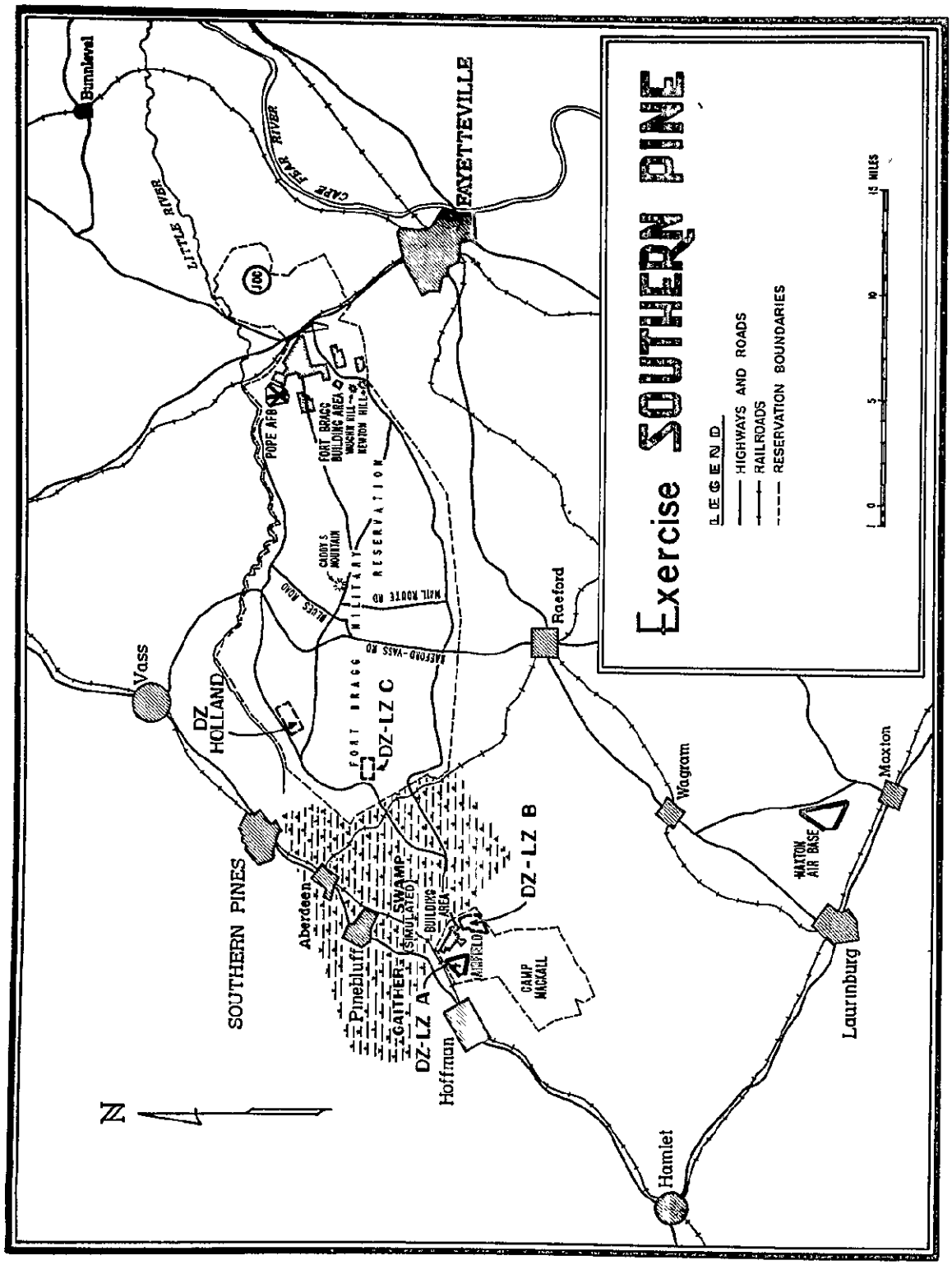
This was the situation when the tactical phase of Exercise SOUTHERN PINE began on 13 August. As a counter to Aggressor plans the Southeastern Theater Commander on 8 August ordered the U.S. Third Field Army to concentrate in the Sanford-Fayetteville-Goldsboro-Raleigh area of North Carolina with the mission of assisting in the containment and reduction of the Aggressor penetration into the Carolinas. The 82d Airborne Division was directed to assemble west of Fort Bragg and prepare to establish contact with Aggressor forces and cover the concentration of the Third Field Army. Ninth Air Force was ordered to conduct tactical air operations within its area of responsibility and to provide close air support to Third Field Army. Troop Carrier Command (Prov) was also available to the theater commander for use in conjunction with airborne operations.[23]

The maneuver area* lay generally between Hamlet and Fayetteville. Ground operations were conducted on an east-west axis, about 18 air miles in length, between Fort Bragg and Camp Mackall. The northern boundary of the zone of action was the Little River, and the southern boundary ran roughly parallel to the river and 10 to 12 air miles south of it. Because of the high cost a large tract of land in this area could not be leased and was not available for use in the ground maneuver. For the purposes of the exercise this tract was assumed to be swampland and was called Gaither Swamp. Although the swamp itself was declared off limits, certain roads passing through it could be used. These were considered to be causeways for passage over Gaither Swamp.[24]

The tactical phase of Exercise SOUTHERN PINE began at one minute after midnight on 13 August. A day earlier the 82d Airborne Division, located in the immediate vicinity of the Fort Bragg cantonment area, received orders to screen the concentration of the 28th and 43d Infantry Divisions of VII Corps, which were assembling several miles to the north and east of the post. In pursuance of its mission the 82d moved forward to the southwest at 0530 on 13 August, made contact with Aggressor forces, and penetrated the Aggressor outpost line. On 14 August the division forced the Aggressor to withdraw eight miles farther west to a new line along Blues and Mail Route Roads and anchored on Gaddy's Mountain. The next day's action centered on Gaddy's Mountain, which the 82d captured late in the afternoon. The Aggressor then pulled back to a new front along the Raeford-Vass Road. By dawn on 16 August the 28th and 43d Divisions relieved the 82d, with the 28th Division occupying the southern and the 43d Division the northern zone of action.[25]

*See Map 2.

MAP 1



For nine days sporadic fighting continued in the Raeford-Vass Road area with neither side being able to gain an advantage. To break the deadlock, a coordinated ground and airborne attack was launched by U.S. forces on 25 August. The 28th and 43d Divisions attacked along the ground and the 82d Airborne Division delivered the airborne assault. The ground attack moved off at 0530 followed at 0900 by two battalions of the 504th Regimental Combat Team (RCT), which were dropped across the roads leading into the eastern end of Gaither Swamp. The third battalion of the 504th was dropped at the western exits of the swamp to establish roadblocks there. At 1300 the single battalion on the western side of the swamp was reinforced by the airdrop of the entire 505th RCT. The following day at 0900 the remaining elements of the 82d Airborne Division were committed in the same area. At 1417 elements of the 82d established contact with the units of the advancing infantry divisions, and a few hours later the link-up was completed. At 0720 the following morning, 27 August, the tactical phase of the exercise was terminated.[26]

Air Force Operations

During the tactical phase of Exercise SOUTHERN PINE (13-27 August) friendly air engaged in fighter-bomber, bombardment, reconnaissance, and troop-carrier operations. In this phase the 123d Fighter-Bomber Wing's F-51's flew 612 close-support, 190 interdiction, 201 fighter-sweep, and 43 escort sorties.[27] Operations by the B-45 equipped 85th Bombardment Squadron consisted of 173 sorties flown against enemy airfields, railroad bridges, and marshaling yards.[28] Reconnaissance activities by the 117th Tactical Reconnaissance Wing began in July, when the wing flew photo coverage of the maneuver area for Ninth Air Force planning purposes. In the exercise itself operations were continuous from 6 through 26 August. The unit flew a total of 880 sorties, 709 of which were undertaken to fulfill Army requirements. Day visual and photo reconnaissance missions were flown by the 160th Tactical Reconnaissance Squadron; night photo and visual missions were flown by the 112th Tactical Reconnaissance Squadron (Night Photo).[29]

Aggressor air units flew a total of 848 sorties. Aggressor F-84's and F-51's flew 53 air superiority, 285 interdiction, and 316 close-support sorties; and Aggressor RF-80's performed 87 visual and 46 photo reconnaissance sorties. Sixty-one sorties were flown by courier aircraft.[30]

Airborne Operations—Joint Airborne Task Force

Airborne assault operations in Exercise SOUTHERN PINE were carried out by the joint airborne task force (JATF), composed of the 82d Airborne Division, the 1st Troop Carrier Air Division, the 557th Quartermaster Aerial Supply Company, and the Air Cargo Supply Squadron (Prov). Organized on 23 June the task force was given the mission of seizing by airborne assault the eastern and western exits of the causeways through Gaither Swamp, destroying Aggressor forces in the area, and covering the movement of Third Field Army through the swamp. Ninth Air Force support of the JATF was to consist of air defense of the JATF marshaling area (Camp Mackall), escort of troop-carrier serials, air defense of the JATF target area, close support of ground elements of JATF and Third Field Army, and interdiction of Aggressor supplies into the airborne objective area.[31]

The 1st Troop Carrier Air Division had the mission of delivering personnel and heavy equipment of the 82d Airborne Division into the assault area by parachute and assault landing. It also was charged with air evacuation of actual and simulated casualties from the assault area to evacuation and station hospitals.[32]

The Airborne Assault

The aerial delivery of 82d Airborne Division troops and equipment was carried out in five lifts by the 1st Troop Carrier Air Division, operating from the departure airfield at Maxton Air Base.*

*Actually, Maxton Air Base was in Aggressor territory. It was assumed, however, that troop-carrier aircraft were based at Roanoke, Virginia, and they were required to fly a route covering the same distance as that from Roanoke to the drop area.

Three of the five lifts were performed on D-day for the airborne assault (25 August) and two on D plus 1. On the first lift, beginning at 0900, the 1st and 2d Battalions of the 504th RCT (1,600 troops) were dropped and airlanded on the east side of Gaither Swamp on drop zone-landing zone (DZ-LZ)C,* and the 3d Battalion (500 men) was dropped and airlanded on the west side of the swamp on DZ-LZ A.† Trucks, trailers, and howitzers were also delivered to the DZ's.[33]

In the second lift, which began at 1300, two battalions of the 505th RCT and the 82d Airborne Division command group landed by parachute and assault aircraft on DZ-LZ A, and the other battalion of the 505th landed on DZ-LZ B.†† Troop-carrier aircraft delivered a total of 2,200 troops on this lift, along with trucks, trailers and howitzers. The third lift, which began at 1715, involved the assault landing of vehicles, weapons, and equipment on DZ-LZ A.[34]

At 0900 on 26 August the 1st Troop Carrier Air Division began the fourth lift of the airborne assault, consisting of the delivery of the remainder of the 82d Airborne Division by parachute and assault aircraft on DZ-LZ B. Transported during this lift were approximately 500 replacements for the 505th RCT, approximately 500 troops of division artillery and the 80th Antiaircraft Artillery Battalion, and approximately 700 men from division headquarters and special troops units, plus weapons and equipment. The fifth and final lift of the airborne assault phase began later in the day at 1325. Dropped or assault landed on DZ-LZ A were 40-mm. antiaircraft guns, quadruple mount .50-cal. machine guns, trucks, trailers, rations, and gasoline.†††[35]

During the two-day assault the 1st Troop Carrier Air Division used 96 C-46's, 17 C-119's, 8 C-122's, 5 C-82's, and 1 YH-12 helicopter. The C-46's were employed for personnel drops and evacuation of casualties, the C-119's and C-82's for heavy drops, and the C-122 assault aircraft for airlanding heavy equipment and the evacuation of casualties. Also used for the latter task was the YH-12. In the third lift the C-119's and C-82's, functioning as simulated assault aircraft, airlanded heavy equipment.[36]

Forward Airfield Control Party

To insure proper and safe control of aircraft operating in the assault area, a forward airfield control party (FACP) was established by the 16th Troop Carrier Squadron (Light) (Assault). This party, located administratively at the assault landing zones, was responsible for 1) establishing airfield control facilities, 2) marking the assault landing strips with panels and flags, 3) coordinating with the senior airborne DZ commanders to insure proper police of the airstrips and control of personnel and vehicular movement in the vicinity of the landing areas, 4) providing crash and fire protection for aircraft operating on the landing strips, and 5) furnishing a liaison officer to coordinate with the airborne commanders and aeromedical personnel respectively the unloading of aircraft and the evacuation of casualties.[37]

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*DZ-LZ C was located in a heavily wooded area on the west side of the Fort Bragg Military Reservation.

†DZ-LZ A was located adjacent to the northwest-southeast runway of the Camp Mackall airfield.

††DZ-LZ B was situated adjacent to the old cantonment area on the south side of Camp Mackall.

†††During the two-day airborne assault the 1st Troop Carrier Air Division delivered the following personnel and equipment:

Troops and Equipment	*Assault Landed*	*Dropped*	*Total*
troops	69	5,861	5,930
¼-ton trucks	55	78	133
¼-ton trailers	32	29	61
¾-ton trucks	22	8	30
2½-ton trucks	4	0	4
105-mm. howitzers	10	14	24
.50-cal. quadruple mount machine guns	0	6	6
40-mm. antiaircraft guns	1	7	8
6,000-lb. platforms	0	24	24
2,200-lb. containers (A-22)	0	50	50
motorcycles	4	0	4

Departure Airfield Control Group

During the airborne rehearsal of 30-31 July, there arose at the departure airfield a number of problems that required last-minute coordination and action by personnel preparing to enter the airhead. To correct this situation a departure airfield control group (DACG) was organized to coordinate the details of aircraft parking, loading, and troop and vehicle movement on the departure airfield—Maxton Air Base. The group functioned under the direct supervision of the JATF commander and was manned by personnel from the 82d Airborne Division and Troop Carrier Command (Prov). It included a departure airfield control officer, a G-3 plans officer, an air movement officer, a G-4 parachute and heavy-drop officer, and the air liaison officer of the 82d Airborne Division G-3 section.[38]

The group's operating location was in the immediate vicinity of the JATF command post at Maxton. From this position troop-carrier and airborne officers, using a communication net and a group of liaison officers, controlled the progress of aircraft loading. Each troop-carrier group parking area and the heavy-drop and assault aircraft loading areas were connected to the control group by field telephone. Additional telephone lines connected the control group and the airfield control tower, the JATF command post, and the troop bivouac areas. The troop-carrier groups and the 1st Troop Carrier Air Division furnished liaison officers to operate the troop-carrier part of the control system.[39]

Miscellaneous Personnel and Supply Drops

Troop-carrier operations in Exercise SOUTHERN PINE included, in addition to the airborne assault of 25-26 August, two small personnel drops and two emergency supply drops. On 18 August nine Troop Carrier Command C-46's dropped 225 men from ranger companies of the 28th and 43d Divisions on DZ Holland,* and on 20 and 21 August the command took part in the drop of 100 Aggressor troops by six C-46's on several unprepared DZ's behind the U.S. forces' frontlines. Emergency supply of ground units was carried out at 1800 on 20 August, when six C-119's dropped supplies to a unit of the 28th Division that had been cut off by Aggressor forces, and again at 1900 on the same day, when three C-119's dropped supplies to a unit of the 43d Division in the vicinity of DZ Holland. Simulated emergency supply drops were carried out on 13, 14, 17, and 18 August. On the missions of 17 and 18 August, one 175-pound door bundle was actually dropped from the lead aircraft for each mission.[40]

Aerial Port Operations

Aerial port operations in SOUTHERN PINE were carried out jointly by the Air Cargo Supply Squadron (Prov) and the 557th Quartermaster Aerial Supply Company. Activated on 20 July 1951 by Eighteenth Air Force the Air Cargo Supply Squadron (Prov) was assigned the mission of receiving, temporarily storing, and later preparing for delivery by parachute, free fall, or air landing all classes of supplies and equipment. The squadron was also responsible for loading and lashing supplies and equipment on troop-carrier aircraft under the technical supervision of aircrew members and for the ejection of cargo during flight.[41]

Lacking both equipment and experienced personnel, the Air Cargo Supply Squadron (Prov) received help from the Army's 557th Quartermaster Aerial Supply Company. Working together during the exercise, these units carried out their joint mission of operating aerial supply points, packaging and loading aerial supplies, furnishing personnel to eject supplies during flight, giving technical assistance to airborne units, and supervising the recovery of quartermaster aerial supply equipment.[42]

Aeromedical Evacuation

During the airborne assault phase actual, serious casualties were evacuated from the DZ's by YH-12 helicopter and flown directly to the Fort Bragg Hospital. Other actual casualties were

*See Map 2.

flown by C-122 aircraft from the LZ's to Maxton Air Base, where they were transferred to C-46 aircraft for further air evacuation to Pope AFB. On the morning of 25 August—the first day of the airborne assault—the YH-12* evacuated casualties from DZ C, and during the afternoon it evacuated them from DZ A. On 25 and 26 August the C-122's at regular intervals evacuated casualties from the LZ's. Patients were backlogged at holding points in the vicinity of the assault strips and loaded as space became available following the unloading of vehicles and artillery pieces from the C-122's. In the course of the airborne assault the YH-12 evacuated 14 casualties from the DZ's to the Fort Bragg Hospital; the C-122's moved 83 casualties from the LZ's to Maxton Air Base; and the C-46's carried 97 casualties from Maxton to Pope AFB. These were all actual casualties; a few simulated casualties were also evacuated.[43]

Troop Carrier Command helicopters also evacuated some 43d Division casualties during the period 17-24 August. In a plan devised by the division surgeon and the troop carrier aeromedical evacuation unit, a YH-12 helicopter, manned by a pilot, a co-pilot, and a medical attendant, would land at the division landing strip and contact the aeromedical representative at the division command post. The anticipated requirements for the day were given to the helicopter pilot, and as forward collecting points received casualties needing evacuation, information as to their number and location was relayed through division to the helicopter. In picking up casualties the helicopter landed on signal from the ground in the vicinity of the forward collecting point, which was usually near a regimental command post. Aeromedical personnel at the forward collecting points selected a suitable landing site for the helicopter and marked the center of it with a predetermined panel signal. After landing, the helicopter was loaded with as many as four patients, who were then transported to the rear.[44]

The basic planning for aeromedical evacuation was carried out by the Ninth AF air surgeon, and the responsibility for providing the three necessary aeromedical evacuation units was assigned to Eighteenth Air Force. The 2d Forward Medical Air Evacuation Flight provided personnel to care for and evacuate casualties at DZ's, LZ's, and clearing points in the forward combat areas. The Aeromedical Holding Station (Prov) received casualties as they arrived by helicopter and assault aircraft from the forward areas, processed them, and transported them to a fixed installation. Holding stations were located at Maxton Air Base, Pope AFB, and the 403d Evacuation Hospital at Fort Bragg. The Tactical Medical Air Evacuation Flight at Maxton received casualties for processing and further flight to Pope, and thence by ambulance to Fort Bragg Hospital.[45]

The Army's 6th Transportation Helicopter Company also participated in aeromedical evacuation. Responsibility for aeromedical evacuation, which has been a frequent subject of interservice controversy, was resolved for this exercise by a compromise that gave to each service the responsibility for providing aeromedical evacuation for an approximately equal number of U.S. forces combat units. In all, the Army helicopter company transported 307 actual casualties, most of them directly from the frontlines.[46]

Communications

Air Force communications for Exercise SOUTHERN PINE were furnished principally by the 507th Tactical Control Group and the 933d Signal Battalion. The 507th installed, maintained, and operated the facilities of the tactical air control system. For friendly forces the group established a tactical air control center (TACC) adjacent to the joint operations center (JOC) at Ninth Air Force headquarters, Outer Fort Bragg; a tactical air direction center (TADC) at Pope AFB, supported by lightweight (L/W) radars at Raleigh-Durham, Fort Fisher, and Goldsboro; two tactical air direction posts (TADP), one at Pope and the other at Newton Hill, Fort Bragg; and a direction-finding (D/F) net of five stations—Vaughn Hill (Fort Bragg), Bladenboro, Parker, Raleigh-Durham, and Goldsboro. The group also supplied 12 tactical air control parties (TACP), 8 for the 28th and 43d Infantry Di-

*Two YH-12's were assigned to the exercise. On 22 August one of the two crashed and was damaged beyond repair. During the two-day airborne assault, the other was in commission only on the first day.

visions and 4 for the 82d Airborne Division, the latter being controllers who jumped with the 82d in the airborne assault.[47]

The TACC exercised general control of all U.S. aircraft, turning over specific assignments to the TADC, where controllers at planned position indicator radar scopes directly controlled the aircraft. Close-in control in the target area was performed by TADP radar and by TACP's. To provide warning of enemy aircraft, the L/W radar operators reported to the TADC, which in turn reported to the TACC. The D/F net, which terminated in the TACC, was used to assist aircraft in distress.[48]

The mission of the 933d Signal Battalion was to provide an integrated communication system for command, administrative, and operational functions of Ninth Air Force. The elements of this system included FM radio circuits between Headquarters Ninth Air Force and Maxton Air Base; teletype and telephone circuits between the Pope AFB switchboard and Fort Bragg, Camp Mackall, Shaw and Langley Air Force Bases, Maxton Air Base, and New Hanover County Airport; and an HF-CW radio net terminating at Ninth Air Force headquarters with stations at Langley, Shaw, Maxton, and New Hanover.[49]

For the Aggressor air force the 727th Aircraft Control and Warning Squadron of the 507th Tactical Control Group established a TACC, adjacent to the Aggressor JOC at Camp Mackall; a TADC at Maxton Air Base; and L/W radars at Maxton, Camp Mackall, and Shaw AFB. TACP's were also furnished to the Aggressor forces.[50]

Sharing the task of supplying Air Force communications for SOUTHERN PINE, the 3d Shoran Beacon Unit provided short-range navigational aid for aircraft of the 112th Tactical Reconnaissance Squadron (Night Photo). Its headquarters section and a computation section were set up at Outer Fort Bragg near Ninth Air Force headquarters and it installed and operated Shoran beacons at Mt. Mitchel, North Carolina, Allendale, South Carolina, and Chapel Hill, North Carolina.[51]

Atomic Weapons Operations

The conduct of special weapons operations was a significant aspect of Exercise SOUTHERN PINE. Since atomic weapons play was introduced so late in the planning phase, it was decided not to allow it to interfere with the play of the maneuver as scheduled. Atomic weapons operations were conducted in the form of a joint Army-Air Force command post exercise (CPX) superimposed on the actual maneuver. Participating in the CPX were a special weapons group, composed of two Army and two Air Force officers, who formed a special staff section of maneuver director headquarters, and selected personnel from Southeastern Theater headquarters, Ninth Air Force, Third Army, and VII Corps. The purposes of the atomic weapons play were 1) to promote general understanding of the tactical employment of atomic weapons; 2) to test the integration of such weapons into existing joint doctrine, procedures, agencies, and facilities for air-ground operations; 3) to determine whether the accepted procedures for coordination of fires were adequate to provide for the safety of friendly air and ground forces; and 4) to develop recommendations for conduct of special weapons play in future maneuvers.[52]

During the play of Exercise SOUTHERN PINE, the special weapons group had access to all information on enemy and friendly troop dispositions. It maintained a 1:25,000 scale situation map and a 1:12,500 scale activity pattern map. The purpose of the latter was to enable the group to keep a record of all enemy activity, a record, it was hoped, that would reveal areas of maximum activity and would aid in determining troop density in possible target areas. Most of the information came from the Air Force, particularly from reports of aircrew debriefings. The situation during the exercise was so fluid that it was impossible to determine accurately troop density in possible target areas. Activity patterns were revealed, however, and this information helped to determine aiming points and to predict results. Several situations were developed in which the use of atomic weapons would have been decisive. One air-superiority mission was artificially set up to test joint procedures in planning such missions.[53]

CHAPTER II

EXERCISE SOUTHERN PINE—FINDINGS

General

By and large, SOUTHERN PINE was a successful exercise. Commanders and staff officers gained experience in planning and conducting joint operations, particularly close-support and airborne operations; and individual officers and airmen received valuable training and benefited from working in the field under simulated combat conditions. Especially important was the field training afforded units that had been called to active duty following the outbreak of war in Korea.* These units performed well, a performance Ninth Air Force attributed to "a combination of hard work, high morale, good discipline, and intelligent supervision."[1]

Although the exercise was viewed with general satisfaction, a number of problems and difficulties arose in the fields of planning; organization; close-support, bombardment, reconnaissance, and troop-carrier operations; and communications. For a balanced view of the exercise the accomplishments in these fields must also be considered, and the good as well as the bad reviewed.

Planning

Joint planning by the maneuver director's staff was hampered by the inexperience of the joint staff sections, particularly the J-3 and J-4 sections. Most of the officers in the J-3 section were new in both staff and maneuver work. Moreover, although the section was established on 22 January 1951, some positions were not filled until the latter part of March. Since the detailed and complex planning conducted by a theater J-3 section demands officers with extensive experience in high-level planning and since a maneuver headquarters consists of relatively short-term staff members, it was the opinion of the J-3 section that key officers should be graduates of the Armed Forces Staff College or have equivalent practical experience and that other staff officers should be graduates of the Command and General Staff School or Air Command and Staff School or have equivalent experience.[2]

It is unlikely, however, that for any maneuver these requirements could be fully met; there will almost always be a shortage of fully trained or experienced staff officers. Indeed, one of the purposes of joint training exercises, and certainly an objective of Exercise SOUTHERN PINE,† is to provide experience in joint staff planning. It is desirable, of course, that key joint staff positions be filled by experienced officers, particularly when the planning period is short. No less important, however, is the need for filling all joint staff positions promptly in order that the objective of furnishing experience in joint staff planning may be fully realized.

Late arrival of personnel also adversely affected the work of the J-4 section. Air Force personnel reported 22 days after the opening of maneuver director headquarters on 22 January, a time-lag that caused considerable confusion and resulted in hurried planning. That Air Force J-4 personnel were drawn from commands other than Ninth Air Force was also a complicating factor. Since the Ninth was to provide logistical support for all Air Force units taking part in the exercise, it would have been better if personnel from the Ninth, familiar with tactical air force logistics, had been assigned to the J-4 section.[3]

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*The 117th Tactical Reconnaissance Wing and the 123d Fighter-Bomber Wing were composed of Air National Guard units called to active duty on 10 October 1950, and four of the five troop-carrier wings were reserve units called up after March 1951.

†See above, pp. 1-2.

Another stumbling block to smooth joint planning was the failure to resolve interservice controversies before the beginning of the planning phase. In this exercise the major points at issue were aeromedical evacuation and the loading of personnel and equipment aboard troop-carrier aircraft for airborne operations and emergency supply drops. Joint planning was disrupted and delayed by the lack of interservice agreement on these matters. As a solution to this problem General Hodge, the maneuver director, recommended that early in the planning stage of future maneuvers an agreement be reached between the headquarters involved and that any controversy regarding joint planning, doctrine, or tactics be settled for the period of the maneuver by the maneuver director.[4] Ninth Air Force took the somewhat different view that problems of this nature and scope cannot be resolved at numbered air force-field army level, and it recommended that controversial matters concerning interservice doctrine be resolved at higher headquarters before the beginning of detailed planning or that the activity in dispute be eliminated from the maneuver.[5]

Air Force planning was marked by one notable success and also by troublesome problems caused mainly by constant changes in the troop list for the exercise. On the credit side the J-4 section report states that the monitoring of the operation orders and administrative plans of Ninth Air Force, Troop Carrier Command, and Aggressor air headquarters revealed no conflicts with the general plan for the exercise and that the completeness of the plans was proved by the fact that there were no supply breakdowns during the actual play of the maneuver.[6] A major handicap to sound Air Force planning was the constantly changing troop list for the exercise. Because of the Korean war and the increase of U.S. forces in Europe, it was difficult to stabilize the list, and changes continued to be made through the first week in August. There were also numerous additions to the list. Although there were only 14 Air Force units on the original troop list, 48 units were engaged in the exercise when the operational phase began on 13 August.[7] These circumstances were bound to result in haphazard and hurried planning.

Nor was the Air Force planning situation improved by the withdrawal of the Navy from the exercise. Early in February Tactical Air Command had asked the Navy to take part, and until early May it was anticipated that the Navy would assign a number of units, including a carrier air group, to the exercise. Unfortunately, disagreement over the manner in which Navy air was to be controlled and employed led to the withdrawal of Navy units from the exercise. The dispute involved fundamental differences between the two services relative to the problem of command and employment of air units, differences that had appeared in Army-Navy-Air Force amphibious exercises held during the period 1946-1950 and that are still unresolved.[8] Not until 18 May did Ninth Air Force learn of the Navy's withdrawal, requiring the entire air plan to be revised. Three months' planning had to be redone, and additional Air Force units had to be requested from Tactical Air Command to replace Navy air units.[9]

Planning was also hampered because it had to be done as an additional duty by members of the regular staff of Ninth Air Force headquarters. Under this arrangement effective planning was difficult; the plans division had to accomplish most of the necessary coordination by means of R&R slips, telephone calls, and personal visits--a situation that made for delay, confusion, and misunderstanding. Better results could have been achieved, the Ninth believed, if a special planning staff had been formed for the maneuver. The Ninth recommended that 1) a complete planning staff be established at Ninth Air Force headquarters and at comparable headquarters to prepare operations plans for future major maneuvers, 2) an officer from Ninth Air Force plans division be appointed project officer for each exercise and charged with the overall responsibility for drawing up the plan, 3) a small group of officers selected from appropriate staff sections be assigned to this planning group, 4) the preparation of the plan be their primary duty until the plan was completed, and 5) the operation plan be published at least 60 days before the movement of advance echelons into the field.[10]

Organization and Command Structure

On paper the organizational structure for Exercise SOUTHERN PINE was sound, and none of the important difficulties of the exercise are traced directly to faulty organization. Doctrinally, however, the organization as it actually functioned was open to criticism. One of the purposes of the

exercise was to test joint doctrine as set forth in the Joint Training Directive for Air-Ground Operations. In an orthodox organization for tactical air operations conducted in support of ground forces, a tactical air force works directly with a field army. These two organizations are at the same level of command, and both are directly under the theater commander. This was the organization established for SOUTHERN PINE; under the Southeastern Theater commander, Ninth Air Force and Third Field Army were at the same command level.*

In actual practice there was considerable deviation from this structure. Ninth Air Force actually moved into the field, where it functioned in its true role as a tactical air force. But Third Field Army did not take the field; it was in reality only a paper organization, and the senior Army organization in the field was VII Corps. At the evening planning conferences at the JOC, the VII Corps commander acted as the commanding general of Third Field Army. Third Field Army G-2 and G-3 air officers were provided for the JOC, but since Third Field Army was not in the field, the air-ground operations system personnel were attached to VII Corps for the operational phase of the exercise. Noteworthy was the comment in the VII Corps report that it was necessary to have "considerable coordination between the Corps and the JOC which would normally have been accomplished at Army level."[11]

As a result of this situation Ninth Air Force was actually working with a corps rather than with a field army as called for in established doctrine. Because of the absence of an operational field army headquarters, that part of the directive could not be tested in this exercise.

It is possible to infer that the Army, influenced by those of its members who feel that there should be decentralization of control of tactical air below field army-tactical air force level and that lower-echelon ground commanders should have a greater share in determining how air is to be employed, was not overly concerned about this violation of doctrine. Indeed, it has been suggested that the Army deliberately tried to force Ninth Air Force to operate in the field with an Army Corps.[12] Final reports of the exercise offer little evidence to support this contention. In fact, VII Corps, complaining that the absence of an operational field army headquarters diverted corps personnel from their normal functions, recommended that a field army headquarters be included in future large-scale maneuvers.[13]

It was significant, however, that the maneuver director, General Hodge, an Army officer, expressed dissatisfaction with command relationships as set forth in the joint training directive. Hodge believed that these relationships should give "complete control of forces to the commander responsible for the accomplishment of the mission."[14] The practical effect of such a suggestion could very well be that a tactical air force would find itself not only working directly with an Army corps but also working under the operational control of a corps commander. It was hardly surprising that Hodge's recommendation in the maneuver director's report was accompanied by a statement of nonconcurrence inserted by the deputy maneuver director, General Wolfinbarger of Ninth Air Force.[15]

Fighter-Bomber Operations

During Exercise SOUTHERN PINE the Air Force engaged in virtually the entire range of tactical air activity, including fighter-bomber, bombardment, reconnaissance, and troop-carrier operations. In fighter-bomber operations the chief emphasis was on close-support training for the air and ground forces, although the considerable simulated action resulted in loss of realism. For Ninth Air Force the first priority for training was close support of the 28th and 43d Infantry Divisions. Originally, it had been planned that there would be sufficient fighter-bomber aircraft to provide the needed close-support training and at the same time carry out a realistic counterair and interdiction program. Later in the planning when there was a reduction in fighter-bomber strength, there was no comparable reduction in the air effort devoted to close support, which was kept at its original level. Simulated aircraft were used for the air-superiority and interdiction tasks. Aggressor air, for example, flew 53 actual air-superiority sorties and 1,693 simulated sorties. This situation reduced realism and presented for the air umpires a particularly difficult problem from the standpoint of loss-damage assessment and

*See Chart 1.

control. Use of simulated aircraft, the air umpire believed, should be kept to a minimum; however, if they were authorized, a detailed plan should be developed to cover the umpire problem, and token aircraft should be employed for the simulated missions.[16]

Also unrealistic was the concept for air operations as it was actually applied to close support. It was assumed that the Aggressor had a three-to-one ratio of air superiority during the first ten days of the exercise. Nevertheless, during this period friendly air flew a large number of close-support sorties. Faced with these odds, friendly air would have had in combat a very limited close-support capability. In order to provide necessary close-support training, sound principles of air employment had to be violated.[17] A loss of realism resulted, and the impression may have been created that close support in combat would be available in some quantity despite a very unfavorable air situation.

Close Support

The carrying out of close-support operations during the exercise gave some cause for satisfaction but presented also some troublesome problems. The 82d Airborne Division found air support to be "generally excellent" during all phases of the exercise.[18] Air strikes were delivered with reasonable promptness. The average time for processing an immediate request, from the time the request was submitted until the actual attack, was 32 minutes.[19] The Air Force record here was especially good. The average time lapse from receipt of a request in the combat operations section of the JOC to the time of the strike was 11 minutes, and only 7 minutes if the aircraft were on air alert.[20]

On the debit side it was found that although Army participants as a result of the exercise, learned how to obtain close-air support and were made aware of its many possibilities, there was still a need for further indoctrination of all ground troops in this type of operation, particularly of unit commanders from corps down. It was difficult to get the divisions to submit preplanned requests, and there were a number of shortcomings in the Army's air-request machinery. Part of the trouble was due to a lack of experience, and part of it was traceable to poor communications. At division, regimental, and battalion levels the Army's use of inexperienced personnel limited the effectiveness of the air-ground operations system. For example, one division G-3 air officer had no training in air-ground work, and in another division this same key position was filled by one of the division liaison officers who had not attended the USAF Air-Ground Operations School. Graduates of the school were present in the division but were assigned to other duties. Some officers performing air-ground operations system duties were reservists on 90-day tours of active duty, and the experience they gained was to some extent lost to the Army.[21] According to Ninth Air Force, Army officers who manned the air-ground operations section in the JOC were almost totally unfamiliar with operating techniques and functions and did not understand the basic concepts of air-ground operations.[22]

Communication difficulties within the air-ground operations system centered around the absence of workable battalion-to-division air-request nets. Requests had to be forwarded by either infantry or artillery nets to the G-3 air officer at the fire support coordination center. Because of a shortage of radio frequencies, these lines of communication were jammed with traffic, and it was virtually impossible to get an immediate strike request back through them. This situation led to the use of the control communications of mosquito aircraft and TACP's for forwarding requests, which was a violation of prescribed requesting procedures.[23]

The Army was remiss in its marking of targets to be attacked by the fighter-bombers. Early in the exercise no provision was made for designating targets with smoke. Later, the umpires marked the targets with violet-colored smoke, an arrangement that was moderately successful. More serious was the failure to use panels to mark U.S. frontline positions for friendly air, an omission that made it exceedingly difficult for the Air Force to render close support, especially during fluid situations.[24]

Close-support deficiencies were by no means limited to the Army. The Air Force also had personnel problems. With the exception of four officers, none of the JOC combat operations section personnel had ever had contact with or experience in a JOC. This fact, combined with the low-experience level of JOC Army personnel, prompted Ninth Air Force to recommend that command post exercises of three-to-five day's duration be held monthly to train JOC personnel. Included in the

exercises would be actual aircraft, communication facilities, operations personnel, and air control and warning facilities.[25]

Other deficiencies affecting close support were noted by the 123d Fighter-Bomber Wing. Heading the list were two shortcomings that made operations "extremely hazardous." Firstly, weather forecasting was poor, and the JOC had no accurate knowledge of weather and visibility over the target area. Secondly, the airspace over the maneuver area was too small for the number of aircraft operating there, and the danger of air collision was considerable. In addition the 123d Wing complained that periodic intelligence summaries were received too late each day, often as late as 0800, to be of use in early morning briefing.[25]

Close-support operations were hampered also by the indifferent performance of the TACP's. The TACP's tended to ignore pilot spot reports on targets of opportunity. Flights were often held for an excessive time at orbit points before being called in by the TACP's. This was a particular handicap with jet aircraft because of their high rate of fuel consumption. Part of the trouble lay in the lack of experienced personnel in the TACP's. A clue to the state of their training was that some of the radio operators did not know the phonetic alphabet. About half the TACP's had serious communication difficulties,* which were attributed to the inadequacies of the AN/VRC-1 radio equipment and to the shortage of skilled radio mechanics.[27]

A major operational difficulty affecting close support was the lack of adequate maps and charts. The maps of scale 1:25,000 and 1:50,000 that were employed were too bulky for use in a fighter-bomber cockpit and contained extraneous information that only confused the pilots engaged in close-support work. Maps of scale 1:250,000 were also used, but these contained insufficient detail for adequate coverage. As a solution Ninth Air Force recommended that a board of officers and aeronautical chart service technical representatives be convened at the Ninth's headquarters to explore the possibility of securing maps ranging in scale from 1:100,000 to 1:150,000 and containing pertinent information and proper coloring.[28]

A related difficulty was the failure on some occasions of ground and air units to use the same grid system. Most of the maps used by the ground forces were overprinted with the Universal Transverse Mercator (UTM) grid, but some of the Air Force maps were overprinted with the Geographical Reference (Georef) grid. On some missions the fighter-bombers used the Georef maps, whereas the TACC and TACP's had only the UTM maps. In a high-speed aircraft there is no time for transposition, and as a consequence pilots could not complete their missions. Obviously, those in the air and those on the ground should use the same map grid system.[29]

Exercise SOUTHERN PINE produced some findings relative to the use of mosquito aircraft, such as T-6, F-51, and RF-80 aircraft, for airborne control of fighter-bomber attacks. All these aircraft had the capability of securing information on ground targets, coordinating fighter-bomber attacks, and marking targets by lead-in tactics. However, the T-6 and F-51 were relatively vulnerable to enemy air attack; and for this reason Ninth Air Force recommended the use of jet aircraft for this work, preferably tactical reconnaissance aircraft.[30] But the 117th Tactical Reconnaissance Wing, whose RF-80's performed this task during the exercise, had serious misgivings about the use of the RF-80 in this role. This unit found that RF-80's were forced to slow down when conducting this type of mission and were unable to accelerate rapidly enough to avoid aerial attack. If they were used in this manner in combat the 117th believed there would be heavy losses.[31]

Bombardment Operations

Bombardment operations in Exercise SOUTHERN PINE were significant because of the use of the B-45 jet bomber. The B-45's had taken part in Exercise SWARMER in the spring of 1950,[32] but they were still a relatively new aircraft at the time of SOUTHERN PINE.

Throughout the maneuver the 85th Bombardment Squadron (L) Jet encountered difficulties in complying with daily frag orders. For most of the missions the bomb run from the initial point (IP) was

*For further discussion of communication problems, see pp. 22-23.

too short for the B-45, which for this aircraft should be approximately 30 nautical miles in length. When a short run from the IP was given in the frag order it was necessary to plan a turning point 15 to 20 miles behind the IP so that the flight was lined up on the axis of attack before passing the IP. Some of the IP's were too hard to identify. On some missions the angle of turn at the IP exceeded 45 degrees, and it was necessary to include a dog leg along the route to the IP in order to make the turn more gentle. Since several targets were out of radio compass range, the observer was handicapped on the bomb run. However, it was still possible to locate IP's and targets, because of good crew coordination and the use of an extremely accurate flight plan log by the observer.[33]

Like the 123d Fighter-Bomber Wing, the 85th Bombardment Squadron had trouble getting accurate weather information during the exercise. According to the 85th Squadron, weather forecasting was unreliable throughout the maneuver, and careful planning was necessary to insure that aircraft had sufficient fuel remaining to reach alternate fields.* It was less disturbing that flight leaders, when requesting information about the weather at the 85th's base at Langley, invariably received old weather sequences from Pope and Raleigh radio.[34]

Reconnaissance

In the joint training exercises held during the past several years there has been a consistent record of deficiencies in the field of tactical reconnaissance. Exercise SOUTHERN PINE was no exception. One of the most common complaints concerned the excessive delays in the processing and delivery of aerial photos. Estimates varied on the time required for taking photos, processing them, and delivering them. One estimate was that the time ranged from 6 to 48 hours, with the average time amounting to 19 hours and 44 minutes.[35] Ten hours was the average given in another estimate.[36] It was generally agreed that there had been unnecessary delays.

The difficulty stemmed from the failure to establish a complete joint air photo center (JAPC) for the exercise. According to the joint training directive, the JAPC is located at the reconnaissance airfield and is composed of an Army engineer photo reproduction and distribution company and photo interpreter teams and an Air Force reconnaissance technical squadron. Although all of these components of the JAPC took part in the exercise, they were not located together at the reconnaissance airfield. Since the engineer photo reproduction company had no field equipment, it had to operate in a permanent building three miles away from the airfield. The 117th Reconnaissance Technical Squadron had only about 30 percent of its T/O&E equipment. Consequently, there was a delay in the interpretation, reproduction, and delivery of photo coverage requested by the Army.[37]

A number of shortcomings seem to have arisen from the Army's lack of understanding of the capabilities and limitations of tactical reconnaissance. Every effort was made to provide the Army with all the photo and visual reconnaissance it needed. Even during the battle for air superiority, when a large portion of the reconnaissance effort would normally be directed at Air Force targets, 70 percent of the reconnaissance missions were flown to satisfy Army needs.[38] However, the effectiveness of missions performed for the Army was reduced, because the Army did not fully carry out its responsibilities.

Most Army reconnaissance requests, which were not presented to the Air Force until 1615 hours each day when the target planning conference was convened, did not allow the Air Force sufficient time for careful planning of reconnaissance missions, planning that would have insured maximum use of aircraft without duplication of effort.[39] Army requests often did not include all the information that was needed to fly the missions effectively. The Air Force needed to know what the ground forces wanted, why they wanted it, when they wanted it, and what use they were going to make of it. In this connection, the Army tended to ignore an obvious source for information--the Army photo interpreters. If they had been consulted, the Army could have furnished the Air Force with much of needed data.[40]

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*The 85th Squadron also reported a number of important findings in the field of communications. These are discussed below on pages 24-25.

Ninth Air Force felt that responsibility for the Army's lack of knowledge of reconnaissance procedures could not be laid to the Air Force, which had provided Army personnel with instruction in this field at the Air-Ground Operations School, at the Command and General Staff School, and at Joint Air-Ground Instruction Team presentations. It recommended that the Army establish schools and training programs to teach Army officers the capabilities and limitations of tactical air reconnaissance; to instruct them in the uses of vertical and oblique photography, black and white photos, color, and camouflage detection; and to impress them with the importance of scale.[41]

The 117th Tactical Reconnaissance Wing criticized Pope AFB as a maneuver base. The longest runway at Pope was 5,200 feet with a newly constructed overrun of approximately 1,000 feet at each end. Short runways made takeoffs and landings in RF-80's extremely difficult during conditions of high temperature* and limited the RF-80's to 40 gallons of fuel in the tiptanks, reducing the time the aircraft could remain airborne. The 117th Wing recommended that in future exercises an airfield with longer runways be provided in order to train pilots in maximum-range missions and to allow aircraft to remain over targets as long as possible.[42]

Reconnaissance operations were also hampered by the failure to coordinate flights of Air Force tactical reconnaissance aircraft in the maneuver area with flights of Army light aircraft. The Army planes, being camouflaged, were difficult to see, and on several occasions they were almost hit by the RF-80's.[43] Because of the increase in Army aviation the closest coordination between the Army and the Air Force was required to reduce the danger of air collisions.

Troop-Carrier Operations

Troop-carrier operations in Exercise SOUTHERN PINE were generally well conducted; all airlifts were performed on schedule and without a serious aircraft accident. The performance of the four troop-carrier wings, called to active duty not long before the exercise, was particularly gratifying. Without exception these units did an outstanding job. According to the 82d Airborne Division the airborne assault, from the standpoint of planning, preparation, and execution, left little to be desired. The 82d reported that "the very close timing and scheduling required of the 1st Troop Carrier Air Division was accomplished in a very excellent manner."[44]

Despite the favorable overall picture there were occasions during the airborne assault when the troop-carrier performance was less than satisfactory. During the first lift on D-day there was overshooting of DZ C, and an unusually large number of paratroops landed in the trees at the far (west) end of the zone.† Two factors contributed to this situation. At the time of the drop a tailwind of eight-to-ten knots caused the paratroops to drift in the direction of flight. To compensate for the wind, the pathfinder team should have located the T off the DZ to the east; however, because of the trees that bordered the DZ at that end, this was not possible. The short length of the DZ (1,250 yards) did not allow for any error by troop-carrier personnel or for any delay by the paratroops in leaving the aircraft.[45]

The difficulty in hitting DZ C indicated the need to develop some better method than the use of the T to determine the release point, the need to select training DZ's of sufficient length to insure adequate over and undershoot areas (recommended minimum length—1,800 yards), and the need to study methods of speeding up the exit of paratroops over the DZ. To improve the latter, Troop Carrier Command suggested that door bundles be reduced in number or eliminated, that green-light discipline be improved, and that additional training be given to troop-carrier aircrews. It was recommended that aircrews be trained constantly at home bases and that methods be established to evaluate training and to select lead crews for flight commander positions. By providing each troop-carrier base with parachute dummies, identification panels, and signal smoke each troop-carrier unit could carry out a continuous training program. Methods of evaluation could be established to select lead crews or flight leaders from the best qualified men.[46]

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*Aircraft require more runway in hot weather than in cold, for as the temperature rises the atmosphere becomes thinner and provides less lift.

†Injuries among these troops were not excessive, and there was little loss of effectiveness.

In addition to airlifting the 82d Airborne Division, Troop Carrier Command dropped the ranger companies of the 28th and 43d Infantry Divisions, made two emergency supply drops to these two divisions, and dropped a small number of Aggressor troops behind U.S. lines. The ranger mission was carried out satisfactorily except for delays by the rangers in making station time on the morning of the drop. Despite these delays all personnel landed on the DZ within 25 seconds of the scheduled time.[47]

The delivery of emergency supplies to the 28th and 43d Divisions was very successful; air umpires accompanying the drop aircraft rated both drops as 92 percent effective. It was demonstrated, however, that procedures for requesting emergency supplies needed to be studied, joint standing operating procedures (SOP) developed, and units trained in the methods of obtaining resupply or emergency supplies by air. It was further shown as a result of these missions that the SOP governing signals between the pilot and dropmaster needed to be reexamined and that the ground units required training in supply discipline in order to prevent damage or loss to parachutes and other equipment used in dropping supplies.[48]

Troop-carrier operations for the Aggressor forces were conducted without difficulties or incidents. Small, unprepared DZ's were used and paratroop "sticks" were kept as small as possible.[49]

Heavy Drops

Heavy-drop operations by the 1st Troop Carrier Air Division and the 82d Airborne Division were a part of each of the five lifts carried out during the airborne assault. These operations were successful, though there were difficulties. Three aircraft had drop-equipment malfunctions that prevented the delivery of equipment into the DZ's, and several pieces of heavy equipment became disengaged from the cargo-parachutes and fell unchecked. Nevertheless, 94 percent of the heavy equipment dropped was serviceable, a percentage that was believed to be the highest ever recorded in a drop of this magnitude.[50]

According to the 82d Airborne Division, this record was due largely to the efforts of the division's Heavy Drop Platoon (Prov), which was specially organized to handle the rigging, loading, and ejection in flight of heavy-drop cargo. Despite this achievement a further study of procedures and techniques for heavy drop was advocated. The 82d urged that a joint Army-Air Force study determine flight formations and procedures for aircraft making heavy drops. The division also observed that the lack of heavy-drop equipment presented a serious problem as far as training of personnel and the development of sound procedures were concerned and that there was a particular need for special materials-handling equipment when the heavy-drop method was used.[51]

Troop Carrier Command noted that the reclaiming and preservation of drop-equipment on the DZ was unsatisfactory and that much of the equipment was mutilated or destroyed in handling. This circumstance prompted the recommendation that all units to whom supplies might be dropped be trained in supply discipline and in the care of parachutes and containers.[52]

Assault-Landing Operations

A highly successful accomplishment during Exercise SOUTHERN PINE was the airlanding of personnel, equipment, and supplies by assault aircraft. The use of powered aircraft for assault-landing operations, a procedure that had never been tested either in maneuvers or in combat, was undertaken by the 16th Troop Carrier Squadron (Light) (Assault). Worked with precision and clocklike regularity, the five C-122's of the 16th Squadron airlanded 78 loads of heavy equipment in the airhead and carried out 83 medical air evacuation patients during the two-day operation. Although five C-122's were actually only a token force, the groundwork was laid for the development of tactics, techniques, and procedures for future operations.[53]

Because assault-landing operations were still in the testing stage, it is not surprising that there should be certain aspects of this type of mission needing study and improvement. Standard type loads and loading procedures needed to be developed, as well as standard procedures and equipment

for the forward airfield control party (FACP). In particular, the FACP's lacked suitable airfield marking kits, signaling devices (pyrotechnics and signal lamps), and VHF radio sets. The organization of the FACP needed to be examined and a quota for parachute training established for its personnel.* The integration of air evacuation operations with assault-landing operations needed to be examined as well. The experience of the exercise indicated that SOP's needed to be established outlining the responsibilities of troop-carrier and airborne personnel on DZ discipline, traffic control, and air evacuation management.[54]

Departure Airfield Control Group

The need to improve operations by troop-carrier and airborne units at departure airfields was also demonstrated in Exercise SOUTHERN PINE. It was evident that in order to avoid confusion and delay there must be a central control agency to supervise such activities as marshaling, manifesting, and loading. In SOUTHERN PINE a departure airfield control group (DACG) was formed to carry out this function. It was believed that a similar group should be employed in all future large-scale troop carrier-airborne operations and that a study should be made to determine the size, specific duties, equipment, and facilities necessary for the efficient operation of the unit.[55]

Aeromedical Evacuation

An important aspect of troop-carrier operations in Exercise SOUTHERN PINE, and one that has been the subject of considerable interservice controversy, was aeromedical evacuation. Most of the problems in this field during the exercise concerned operations by the 2d Forward Medical Air Evacuation Flight in the forward area. It was difficult for the flight to maintain liaison with the FACP, and because of lack of radio equipment and assigned frequencies, communication between the flight and the troop-carrier units was inadequate. The very short turnaround time of the C-122 aircraft posed a difficulty, but as medical crews became more proficient in loading and in setting up a casualty disposition system, the time required for loading was reduced to five minutes. Poor liaison between the flight and the division surgeon of the 82d Airborne Division resulted in a situation in which patients frequently arrived at the assault landing strips too late to be loaded in the C-122's for the return trip to Maxton Air Base. These aircraft worked on a time schedule that could not be easily altered since it was coordinated with fighter aircraft flying cover. Vulnerability of the C-122's while on the ground also made a short turnaround schedule necessary.[56]

Besides revealing certain difficulties, aeromedical evacuation operations produced some useful statistics. Operations in this exercise indicated that under ordinary circumstances a forward medical air evacuation flight can perform 200 to 500 evacuations per day in support of an infantry division, that the aeromedical holding station is capable of handling 500 evacuees per day, and that the tactical medical air evacuation flight, using standard troop-carrier aircraft, can handle the same number per day over distances of from 200 to 400 miles.[57]

Troop-carrier operations in Exercise SOUTHERN PINE involved a number of areas of interservice disagreement. Of these aeromedical evacuation was perhaps the most serious. At the time of this exercise the Air Force claimed for itself primary responsibility for all aeromedical evacuation, both within the combat zone and from the combat zone to points outside. The Army took the position that aeromedical evacuation between points within a field army area was an Army responsibility. During the planning for SOUTHERN PINE Tactical Air Command and Army Field Forces were unable to reach a final settlement of the problem, but it was agreed that during the exercise both the Army and the Air Force methods of air evacuation would be used, with each service providing evacuation facilities for an approximately equal number of units.[58]

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*Because of the lack of trained parachutists, the FACP employed by the 16th Squadron had to be moved to the landing strips administratively. The FACP should have parachuted into the objective area as soon as possible after the beginning of the airborne attack.

This was hardly a satisfactory solution, for it involved wasteful duplication of facilities and effort. However, the exercise did serve to illustrate the effectiveness of the Air Force system of evacuation from the frontlines. Indeed, the system worked so well that on one day of the exercise the division surgeon of the 43d Infantry Division was able to suspend operations by all but the most forward echelon of the ground evacuation chain—the litter bearers. Some 600 officers and men and 100 vehicles of the Army Medical Service were rendered idle by approximately 50 Air Force personnel plus two YH-12 helicopters and one simulated assault transport aircraft.[59] This incident is significant not only because it represented a notable Air Force accomplishment but also because it bore out a statement made during the planning phase by Maj. Gen. W.R. Wolfinbarger, Ninth Air Force Commander, that the Army "will be quick to realize . . . the far reaching effects on their medical establishment if they should agree to Air Force assumption of all medical air evacuation."[60] Assumption by the Air Force of only a part of this task during the exercise certainly had its implications as far as the size and functions of the Army medical establishment were concerned and may to some extent explain the Army's insistance on handling its own evacuation within the combat zone.

There were also implications here regarding the Army's organic light aviation, fixed and rotary wing. Obviously, the need for Army aircraft would be reduced if aeromedical evacuation became an Air Force function. Army plans for increasing its aviation strength would be jeopardized if the Air Force position on this matter prevailed. From the Army point of view, the assumption by the Air Force of the aeromedical evacuation task was doubly dangerous because it posed a threat to both the Army medical establishment and the Army aviation program.

Aerial Port Operations

A second area of interservice controversy was the packaging, loading, and ejection from aircraft of supplies and equipment for airborne operations and emergency supply drops. Assigned to the exercise to carry out this function were an Army quartermaster aerial supply company and an Air Force air cargo supply squadron. These units had similar missions, and no decision could be reached on their respective responsibilities.*An agreement was worked out, applicable solely to this exercise, whereby both units were placed under the control of the joint airborne task force commander and directed to work virtually as an integrated team and to carry out jointly the functions outlined above.[61]

For this exercise the arrangement was a satisfactory one since both units lacked equipment and experienced personnel.† By pooling their resources and with some assistance from the 82d Airborne Division Parachute Maintenance Company they accomplished their joint mission without serious difficulty. Still, there was a need for a precise delineation of responsibility for each of these units, especially if both were manned with experienced personnel and fully equipped and then assigned to the same exercise or operation.

Command Structure for Airborne Operations

Also a matter of interservice disagreement was the establishment of a joint task-force command structure for troop carrier-airborne operations. During the planning for the exercise there was some opposition by Tactical Air Command to Army Field Forces' desire that a joint task force be formed to conduct the airborne assault.[62] The Army Field Forces view prevailed and the assault was carried out by a joint airborne task force.

As to the soundness of the joint task force structure, the exercise offered little proof one way or the other. Generally, the different points of view that cropped up during the planning were reflected

*Basically, this was a controversy between Tactical Air Command and Army Field Forces over responsibility for aerial port operations. The Air Force view was that responsibility for providing aerial port facilities for intratheater airlift rested with the Air Force. The Army insisted that aerial port operations were a function of the Army's Quartermaster Corps and Transportation Corps.

†This was particularly true of the Air Force unit, the Air Cargo Supply Squadron (Prov) which was activated by Eighteenth Air Force just before the exercise. The Army's 557th Quartermaster Aerial Supply Company was better situated since it was a reserve unit called to active duty in March 1951.

in the final reports. The 82d Airborne Division found that the formation of a joint task force improved cooperation and coordination between ground and air units and held that such an organization is necessary to the successful completion of a large-scale airborne operation.[63] The JATF report* stressed the importance of having one overall commander in an airborne operation. The formation of a joint task force, the report said, was "a sound method" of carrying out the missions assigned by the theater commander.[64]

The 1st Troop Carrier Air Division, a component of JATF, was somewhat more cautious in its appraisal of the command structure. It emphasized that during the rehearsal, when there was no joint task force, planning was carried out effectively through staff conferences and close liaison between the 82d Airborne Division and Troop Carrier Command and that for the actual assault, when the joint task force was operative, planning was carried out effectively by the joint staff. The 1st Troop Carrier Air Division took this experience to indicate that either a joint staff or separate staffs working in harmony can satisfactorily plan for airborne operations.[65] Troop Carrier Command (Prov) also found that one method worked as well as the other, but it pointed out that at its level a joint task force was not necessarily required. The whole problem, it believed, was in need of additional study and final decision by the Joint Chiefs of Staff or other high-level authority.[66]

Communications

Exercise SOUTHERN PINE was beset with a wide variety of communication problems. The telephone circuits tying together Ninth Air Force units and the JOC were particularly unsatisfactory. Operational telephone lines were commonly used by both operations and intelligence personnel, and direct scramble lines were not available. Circuits were overcrowded, and excessive time was consumed in placing calls. Voice volume was so low as to be almost inaudible. To correct these deficiencies it was recommended that an operational telephone circuit, with an HF or FM back-up and a direct scramble line be provided from the JOC to each operational unit, that a separate intelligence radio and telephone net be furnished, and that telephone circuits be equipped with boosters to increase voice volume.[67]

The communication difficulties that prevented the effective operation of the tactical air control system were especially annoying. These were largely caused by the use by the TACP's of the antiquated AN/VRC-1 radio. The VHF component of the set, used for ground-to-air communication, worked well; but the HF component, used for point-to-point communication on the ground, was underpowered and lacked sufficient range. Poor maintenance by inexperienced personnel aggravated the situation, and Aggressor jamming rendered the HF channels almost completely useless. Unsatisfactory also were the ¼-ton trucks (jeeps) on which the AN/VRC-1's were mounted. The jeeps used by the 507th Tactical Control Group for this purpose were 1942 models that had traveled on the average nearly 70,000 miles.[68]

A few months after the conclusion of the exercise steps were taken to replace the AN/VRC-1 with the AM/MRC-20, which consists of the same VHF set as is in the VRC-1, a higher-powered HF set, and a UHF set to provide ground-to-air communications with aircraft equipped with UHF, rather than VHF, radios. It was expected that the MRC-20 would be mounted on the new M-38 jeep being built to replace the jeeps used to mount the VRC-1's.[69]

The forward air controllers (FAC) who worked with the 82d Airborne Division during the airborne assault used the AN/TRC-7 to communicate with strike aircraft. Although this set worked better than the AN/VRC-1, its limited range was a distinct handicap, and in many instances aircraft could be contacted only when they were directly overhead.[70] The Aggressor FAC's also used the AN/TRC-7 but found it unreliable and cumbersome for convenient use. However, this set, which unlike the AN/VRC-1 could be hand-carried, allowed the FAC's to get closer to the target and increased the possibility of maintaining visual contact.[71]

The major communication difficulty experienced by the Aggressor air force was the saturation of radio channels. Only one VHF channel was available to control fighter-bomber and reconnaissance aircraft and to report Aggressor strikes to the TADC, the TACC, and the umpire operators. A very

*The joint airborne task force was headed by the 82d Airborne Division commander, which probably explains the similar viewpoints expressed in the two reports.

heavy load was placed on the single frequency, greatly increasing the problems of pilots and controllers.[72]

The difficulty that reconnaissance pilots experienced in forwarding spot reports via VHF radio to the JOC was found by the 117th Tactical Reconnaissance Wing Communications section to be either in the communications system of the JOC or in the inability of ground radio operators to read VHF transmissions.[73]

A great deal of criticism was directed at the radio operators, who, it was found, needed to improve both the operation and the care of their radio equipment. Since reports by TACP's and air liaison officers stressed that the operators had little or no maintenance background or experience, it was recommended that tactical control group radio operators be additionally qualified as radio mechanics.[74]

A major problem in air-to-air and air-to-ground communications was the lack of a central crystal bank where crystals could be readily obtained when recrystalization of aircraft radios became necessary. Reports of changes in crystal stocks at various air bases lagged behind actual changes in the supply. Numerous telephone calls had to be made to these bases to determine whether or not the crystals were available, and aircraft had to be dispatched to several bases to obtain the needed crystals. This could have been avoided if a central crystal bank had been established at Ninth Air Force headquarters. As a result of this experience Ninth Air Force was given authority in January 1952 to establish this facility.[75]

Communication problems affecting air-ground operations were not confined to the Air Force. The Army was not satisfied with its air-ground operations system communications, particularly the operation of the air-request nets. The net connecting the JOC, VII Corps, and the divisions worked fairly well. The backbone of the net was the newly developed AN/GRC-26 radio, and although the set worked well during daylight hours, nighttime static sometimes rendered the radio practically unusable. The effectiveness of the net was also reduced by the lack of sufficient voice channels.[76]

Much more serious was the failure of the Army to organize a reliable air-request net within the divisions. Air requests were forwarded over either the division command nets or the division artillery nets. Because of a shortage of radio frequencies these nets were jammed with traffic, making it extremely difficult to get immediate strike requests back through these channels. The 82d Airborne Division, for example, experiencing much delay in getting requests through from battalion to division, concluded that the authorized allowances for personnel and radio equipment were too small to provide an efficient air-request net within the division.[77]

Radar

Air operations in Exercise SOUTHERN PINE were also hampered by deficiencies in the field of radar. Search radar coverage was inadequate. Because of a lack of moving-target-indicator modifications, search radars lost many targets in the ground clutter. Some radar sites were unsatisfactory, and the heavy search radar used by the TADC was unsuitable for mobile tactical warfare. The radar height finder used in the exercise did not have the range and height capabilities necessary to control a maximum number of interceptions when high-speed, high-altitude aircraft were involved.[78]

Many aircraft were not equipped with identification, friend or foe (IFF) equipment, and many pilots flying aircraft so equipped failed to turn on the set. There was a delay in the transmission of radar information from the L/W radars to the TADC and from there to the TACC, a shortcoming that was attributed to insufficient training in radio procedures and in the use of brevity codes.[79]

Shoran* operations conducted during the exercise were also unsatisfactory. A number of factors contributed to the poor performance. Aircrews, especially navigators, were unfamiliar with the airborne shoran equipment, which was not received until just before the exercise began. Many missions were flown at assigned altitudes of 7,500 feet, when 10,000 feet was the lowest altitude at which signals could be received from both ground stations; on other missions the assigned altitude, although correct,

*Short range navigation.

was not maintained. The inexperience of shoran operators was evident, and in a number of cases targets were selected that were outside the area that could be covered by the ground stations. What was needed, it seemed, was an intensive training program for aircrews and ground controllers in the use of shoran equipment and in the execution of shoran missions and training in shoran missions for planning personnel. It was considered probable that shoran operations could be improved if a liaison officer, familiar with both airborne and ground equipment and with the overall shoran system, were attached to the JOC.[80]

Not all of the radar deficiencies in this exercise could be attributed to the equipment itself or to the personnel operating it. Operational difficulties were traced frequently to the failure of the units that supplied power to the radar sets, but poor maintenance, improper use of the units, and lack of spare parts contributed also. Special criticism was directed at the gasoline-powered units, which required special maintenance after periods of prolonged use. Some power units required 100-octane fuel, which was difficult to obtain in the field. To simplify maintenance and solve the fuel problem, Ninth Air Force suggested that the gasoline units be replaced by diesel engines, but if the gasoline type were retained, it was believed that comprehensive maintenance training would have to be initiated.[81]

Of special interest was an investigation of the capabilities of the AN/APW-11 beacon in conjunction with the AN/MSQ-1 ground radar for use in light bombardment operations. To conduct this test an APW-11 was installed on a B-45 aircraft of the 85th Bombardment Squadron (L) Jet. During the exercise a total of 19 APW-11 simulated bombing missions were flown. Bombing altitudes varied from 20,000 to 25,000 feet, and indicated airspeeds varied from 300 to 350 miles per hour. Principal targets were airfields, bridges, and marshaling yards. The distance of targets from the ground radar station ranged from 40 to 170 miles, and formations of three to eight B-45's were used, with the APW-11 equipped aircraft leading.[82]

The main difficulty encountered was the lack of experience on the part of ground controllers, who failed to take into account relative speeds and radii of turn when vectoring formations of jet aircraft. In very few cases were formations brought over the target on time. The ground radar station would invariably vector the formations beyond the IP or in such a manner that time was lost and target times could not be made good. In some cases, the IP set by the JOC was too close to the target, the angle of turn at the IP was too sharp, or the ground station had trouble correcting drift and heading errors before the aircraft reached the simulated bomb-release point.[83]

In general, however, the 85th Squadron was well satisfied with the operation of the APW-11 equipment. No maintenance had to be performed after the initial equipment inspection; the set operated day after day without preliminary bench checking, and there were no equipment failures. The MSQ-1-APW-11 bombing system, it was felt, would provide Tactical Air Command with a practical offensive tool, making possible the performance of missions hitherto considered impossible. However, the squadron recommended that further tests of bombing accuracy be conducted using actual bombs, that the system be fitted into existing SOP's or that new ones be written, and that the squadron not be committed to another maneuver until at least half of the assigned aircraft had operational radar bombing systems.[84]

The APW-11 beacon was also installed in one F-84 aircraft, and during the exercise test photoreconnaissance missions were flown by placing an RF-80 on the wing of the F-84 being controlled by the MSQ-1 and APW-11 radars. Pinpoint photos were secured on two of five tries with satisfactory coverage of the target, and the 117th Tactical Reconnaissance Wing reported that with dependable equipment this type of control would be possible.[85]

Three night photo missions were flown by RB-26's using the MSQ-1 radar alone for orientation and direction. Two of the three missions were successful, and the third was successful on the second try. The 117th Wing concluded, however, that the MSQ-1 could not be relied on to place photo aircraft over a target at a distance greater than 18 miles, a limitation that apparently would preclude the use of this procedure in combat.[86]

In summing up the communication and electronic problems of the exercise, Ninth Air Force pointed to two major reasons for the numerous deficiencies that occurred--the lack of proper communications equipment and the late arrival of much of it used during the exercise. The situation in

SOUTHERN PINE was so serious that the Ninth, in a letter to Tactical Air Command, used the phrase "degradation of communications" to describe it and urged as a solution that Air Materiel Command assemble the communication and electronic equipment needed for a complete maneuver installation and issue this "package equipment" to Ninth Air Force whenever it was scheduled to engage in a field exercise.[87]

Air Umpiring

An effective umpire system is vital to the success of any training exercise. Such a system did not exist in Exercise SOUTHERN PINE, chiefly because of the lack of a published Air Force manual on air umpiring. Air umpires in SOUTHERN PINE and in earlier exercises were forced to rely on Army FM 105-5, Maneuver Control, which contained only a few paragraphs pertaining to air umpiring. To set up a system for the exercise, the umpires had to examine reports of previous maneuvers, a time-consuming and inefficient process. In the opinion of Brig. Gen. Franklin Rose, chief air umpire for SOUTHERN PINE, "the hopeless floundering about during the first two months was due mainly to the fact that planning and systematic development of the maneuver from the umpire point of view was impossible because of the absence of any published Air Force requirements and Air Force standards of procedure in a maneuver."[88]

Not all air umpiring problems could be attributed to the lack of a manual. According to the air umpire report too many were unqualified for air umpire duty, a situation that could have been avoided if specific qualifications had been listed in umpire personnel requisitions. Aggressor aircraft were indistinctly marked, a shortcoming that prompted the suggestion that the entire tail group of such aircraft be painted with red water colors. Ground umpires also contributed to the faulty umpiring of air operations. Frequently, ground umpires failed to give sufficient weight to the damage caused by close-support strikes, a deficiency which the air umpire believed could be corrected by furnishing them with more definite information concerning the ordnance carried by attacking aircraft. In the opinion of the air umpire, ground umpires needed a thorough indoctrination in the capabilities of airpower.[89]

Air umpiring troubles extended to the loss-damage assessment system. The chief air umpire believed that loss-damage assessment tables should be revised downward and that on-the-spot decisions by air umpires should be made known immediately to the participants in an air engagement. The excessive use of simulated aircraft in SOUTHERN PINE also made umpire control and loss-damage assessment difficult. As a solution to this problem the chief air umpire recommended that simulations be kept to a minimum and that when simulated aircraft were used a detailed plan governing the umpires' responsibilities be prepared and token aircraft be employed.[90]

Atomic Weapons Play

Included to a limited degree in Exercise SOUTHERN PINE was the use of atomic weapons. The exercise revealed no major deficiencies in joint doctrine, procedures, and facilities for the use of atomic weapons in air-ground operations. However, because special weapons operations were added to the exercise at a late date and because they were entirely simulated, only a limited amount of practical training was afforded. The atomic weapons play was not reflected in the overall plan for the maneuver or in the fire plans of the various units. All intelligence agencies were not brought into the play, and key personnel in the several headquarters lacked training in the capabilities of atomic weapons.[91]

From the experience of SOUTHERN PINE, General Hodge, the maneuver director, concluded that planning for atomic weapons play in future maneuvers should be carried out concurrently with other maneuver planning. There was a need for training at all levels in the use of atomic weapons, and intelligence procedures required further testing to determine whether or not sufficiently detailed information could be secured at field army-numbered air force level in time to be of use in selecting targets for atomic weapons. Although the atomic weapons operations had been planned and directed by a special staff section of maneuver director headquarters, General Hodge believed that this work could just as well have been performed by atomic weapons specialists integrated into existing intelligence and operations sections of Army and Air Force staffs.[92]

CHAPTER III

EXERCISE SNOW FALL–PLANS AND OPERATIONS

Exercise Objectives

Even before the conclusion of Exercise SOUTHERN PINE, Army Field Forces and Tactical Air Command began laying plans for Exercise SNOW FALL, a major cold-weather maneuver to be held early in 1952 at Camp Drum, New York. It was contemplated that the exercise would include a four-week period of winter training for Army and Air Force units, followed by a tactical phase during which they would engage in offensive and defensive operations under conditions of snow and extreme cold.

The purpose of Exercise SNOW FALL was to train Army and Air Force units under winter conditions in 1) individual survival, over-snow movement, and the use and care of weapons, equipment, and supplies; 2) planning and executing offensive and defensive operations, to include defense on a wide front, tactical employment of and defense against atomic weapons, and night operations; 3) airborne operations; 4) tactical air operations; 5) air, motor, and rail movement; and 6) logistical support, to include aerial supply by parachute, helicopter, and conventional cargo aircraft and evacuation of casualties by air. The exercise was to provide Army and Air Force headquarters with practical planning and operational experience and experience in joint staff planning for cold-weather operations and was to develop and test Army and Air Force joint tactics, techniques, and equipment for such operations.[1]

Planning

Planning for Exercise SNOW FALL began early in August 1951, following the issuance of warning letters sent by Office, Chief of Army Field Forces (OCAFF), to First Army and by Tactical Air Command (TAC) to Eighteenth Air Force. On 10 September, after a series of conferences, First Army and Eighteenth Air Force submitted to OCAFF and TAC a proposed plan for the exercise, along with the scenario, troop lists, personnel requirements, and estimated costs. Based on these recommendations OCAFF and TAC published on 18 October a joint directive for the exercise.[2]

On 25 October a joint maneuver staff, drawn principally from Headquarters, First Army, and Headquarters, Eighteenth Air Force, was formally established at First Army headquarters, Governors Island, New York. This staff served as a planning staff for the maneuver director and performed operational functions during the exercise. The task of preparing the detailed plan for the play and control of the exercise was assigned to the chief umpire.[3]

The joint directive of 18 October was republished in revised form on 18 December. On that date the deputy maneuver directors (Army and Air Force) conducted a briefing for the joint maneuver staff and for the commanders and staffs of the major maneuver organizations–Tactical Air Division (Prov), Troop Carrier Air Division (Prov), and 11th Airborne Division. At this meeting the Army and Air Force components of the joint task force established for the exercise were instructed to submit operations plans to the maneuver director by 1 January 1952. The J-3 of the joint maneuver staff was given the assignment of joining the two plans together in an abbreviated joint task-force operation plan, with the two subsidiary plans as annexes. The concept for the tactical phase of the exercise and plans for airborne operations were made final on 21 January during a conference between representatives of the joint staff sections and the major maneuver commands.[4]

Although the general plan for the exercise was drawn up by the joint maneuver staff and published on 5 November 1951, changes in the plan and the addition of annexes and appendixes continued through the first part of February 1952.[5]

Since the chief emphasis in this exercise was upon airborne operations, Eighteenth Air Force, TAC's troop-carrier air force, performed most of the Air Force advance planning, including planning for the administrative and logistical support that the Eighteenth was to furnish all participating Air Force units. Ninth Air Force planning was limited to those matters that directly contributed to the ability of participating Ninth Air Force units to perform their maneuver missions.[6]

Organization and Command Structure

During the planning phase it was agreed that Exercise SNOW FALL operations would be carried out by a joint task force composed of so-called Army Forces and Air Force Forces. This task force was to function directly under the Northeastern Theater, with OCAFF and TAC standing in the position of theater commander. The main element of the Army Forces was the 11th Airborne Division, and the Air Force Forces were composed of the Troop Carrier Air Division (Prov) and the Tactical Air Division (Prov).* The Aggressor force was placed directly under maneuver director headquarters.[7]

The maneuver director for Exercise SNOW FALL was Lt. Gen. Willis D. Crittenberger, Commanding General, First Army. The deputy maneuver director (army) was Maj. Gen. Leland S. Hobbs, Deputy Commanding General, First Army; and the deputy maneuver director (air) was Maj. Gen. Robert W. Douglass, Commanding General, Eighteenth Air Force. General Crittenberger also acted as joint task force commander. The major components of the JTF-Army Forces and Air Force Forces—were commanded respectively by Brig. Gen. Ridgely Gaither, commander of the 11th Airborne Division, and Brig. Gen. Homer L. Sanders, Ninth Air Force deputy chief of staff, operations. General Sanders also served as commander of Tactical Air Division (Prov). Brig. Gen. Arthur L. McCulloch, commander of the 514th Troop Carrier Wing, headed Troop Carrier Air Division (Prov). The Aggressor force was led by Brig. Gen. William P. Ennis, Commanding General, XVIII Airborne Corps.[8]

Participating Units

Tactical Air Division (Prov) was composed of the 132d Fighter-Bomber Wing, 363d Tactical Reconnaissance Wing, 151st Aircraft Control and Warning Group, 101st Radar Calibration Flight, and Detachment No. 1, 5th Air Rescue Squadron.† Assigned to Troop Carrier Air Division (Prov) were the 435th Troop Carrier Wing, reinforced by the 55th Troop Carrier Squadron; the 541st Troop Carrier Wing, reinforced by the 346th Troop Carrier Squadron; the 16th Troop Carrier Squadron, Assault (L); and one flight from the 62d Troop Carrier Wing.†† Included also were the 1st Aeromedical Group, the 2d Forward Medical Air Evacuation Flight, the Aerial Port Operation Squadron (Prov), the 443d Air Base Group, and Company A of the 838th Engineer Aviation Battalion. The role of Aggressor air was played by 12 F-51's from the 132d Fighter-Bomber Wing.[9]

Army Forces consisted of the 11th Airborne Division, the 3d Armored Cavalry Regiment, Light (less H Company), and the 601st Quartermaster Aerial Supply Company. Organized as a logistical command, directly responsible to the maneuver director, were approximately 40 Army supporting engineer, chemical, medical, ordnance, quartermaster, signal, and transportation units and detachments. Acting as the Aggressor ground force were the 278th Infantry Regiment, the 191st Field

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*See Chart 2.

†Tactical Air Division (Prov) had available 38 F-51, 5 RB-26, 1 B-26 and 6 RF-80 aircraft.

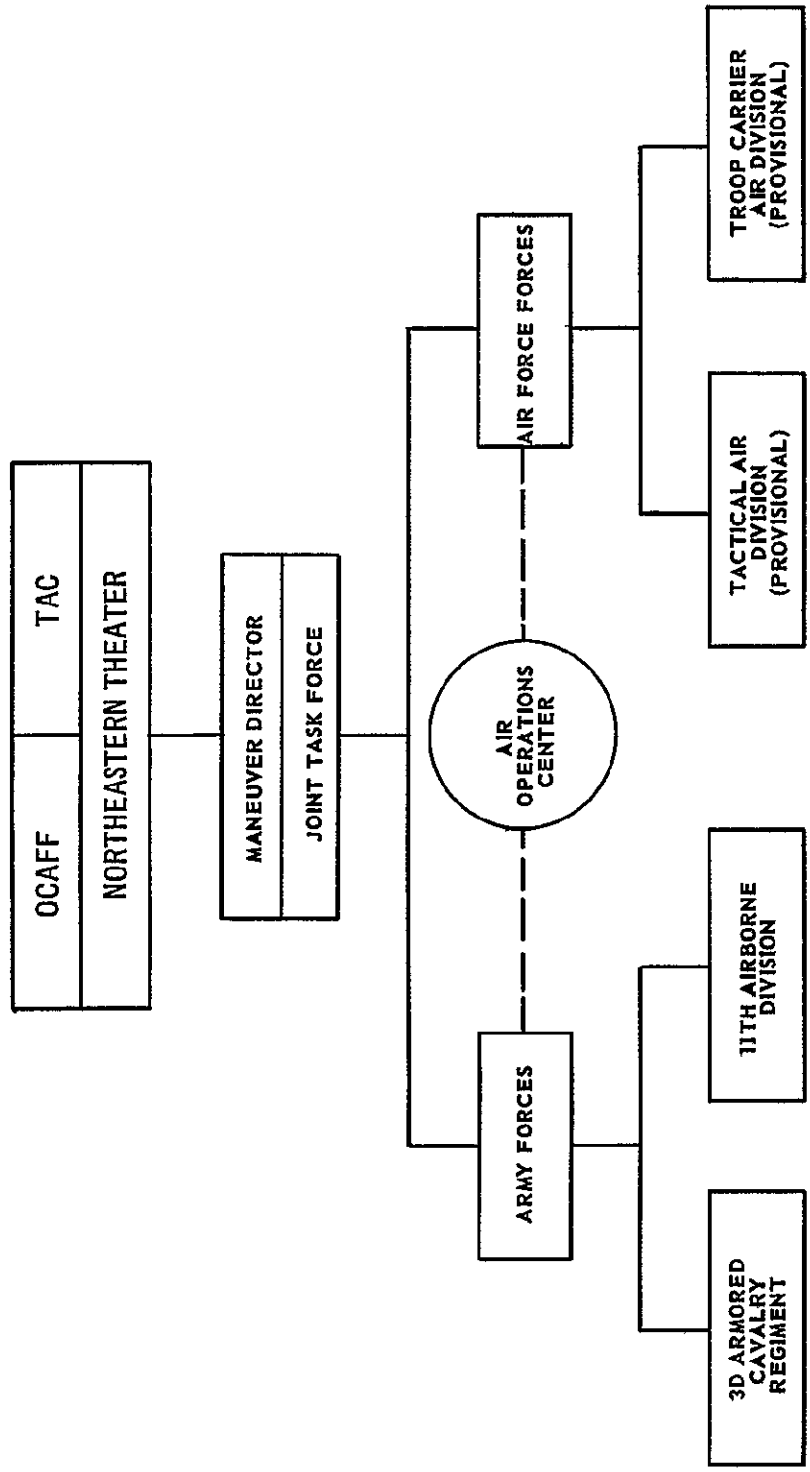
††These units were equipped with the following numbers and types of aircraft:

435th Troop Carrier Wing	27 C-119's; 12 C-82's
514th Troop Carrier Wing	38 C-46's
16th Troop Carrier Squadron, Assault (L)	4 C-122's, 5 H-19's
62d Troop Carrier Wing Flight	2 C-124's

CHART 2

ORGANIZATION

Exercise SNOW FALL



Artillery Battalion, and the 190th Engineer Combat Company, plus attached signal, ordnance, and transportation units. Headquarters, VI Corps Artillery served as Aggressor headquarters.[10]

Exercise Bases

The headquarters of Air Force Forces and Tactical Air Division (Prov) were located at Wheeler-Sack Army Air Field, Camp Drum. Adjacent to Air Force Forces headquarters was the air operations center, which was a small-scale JOC staffed by personnel from Ninth Air Force and First Army. Fighter-bomber and reconnaissance aircraft, along with Aggressor fighter-bombers, were based at Griffiss AFB, Rome, New York. The 514th Troop Carrier Wing operated from Burlington AFB, Vermont, and the 435th Troop Carrier Wing from Grenier AFB, New Hampshire. Based at Wheeler-Sack were the 16th Troop Carrier Squadron, Assault, Light, and Detachment No. 2, 5th Air Rescue Squadron. Headquarters Troop Carrier Air Division (Prov) was situated at Camp Drum.[11]

The movement of participating units to their maneuver locations began early in January 1952. Air Force units, traveling by motor convoy and by airlift provided by Troop Carrier Air Division (Prov), were all in place by 23 January. Army units moved by rail, motor, and air, with Troop Carrier Air Division (Prov) lifting 9,529 personnel of the 11th Airborne Division from Fort Campbell, Kentucky to Wheeler-Sack during the period 8-13 January.[12]

Pre-Exercise Training

Throughout the month of January and during the first week of February, SNOW FALL units engaged in pre-exercise training. For Tactical Air Division (Prov), training, aimed at preparing units for operations in areas of extreme cold, included indoctrination for survival in winter operations, the care and use of equipment under winter conditions, cold-weather and over-snow operations, employment of and defense against atomic weapons, and joint Army-Air Force tactics. Flying activity during this period consisted of orientation flights in the maneuver area, ground-controlled interception missions, cover and escort of troop-carrier serials, photo and visual reconnaissance missions, and individual proficiency flying.[13]

Pre-exercise training by Troop Carrier Air Division (Prov) began with the airlift of the 11th Airborne Division and participating Air Force units to their exercise bases. After these lifts troop-carrier units practiced formation flying and route, initial point, and DZ familiarization flying. A joint airborne and troop-carrier training program that was planned for the period 25 January-2 February was to include an airborne assault by each of the airborne regimental combat teams and a three-day division dress rehearsal for the SNOW FALL airborne attack. However, because of high winds, heavy snow, and low ceilings and visibilities, only three small-scale drops could be carried out, and all of the rehearsal drops had to be canceled.[14]

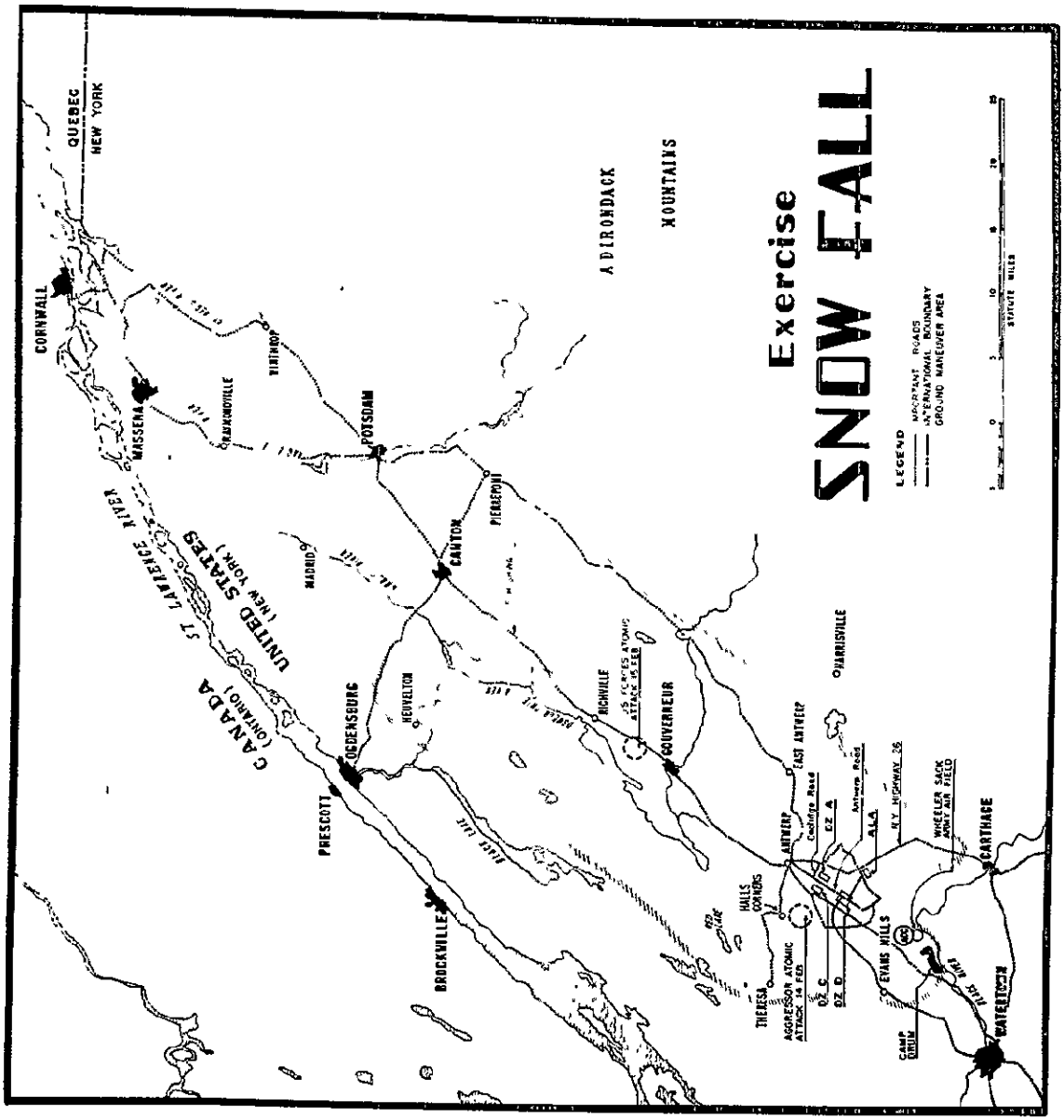
For the Army, Exercise SNOW FALL was preceded by a training and acclimatization phase, lasting from 7 January through 5 February. The period 7-20 January was devoted to small unit training and squad and platoon problems. Company and battalion problems were conducted from 21 through 27 January with emphasis on tactical air support, airborne operations, and night operations in cold weather. The period 28 January-5 February was taken up with regimental combat team problems and joint training, which included parachute jumps, aerial supply and evacuation, and close air support. There was also simulated play of atomic weapons.[15]

Preparations for the field exercise proper were accomplished during the period 5-8 February. Army units reconditioned equipment, moved to assembly areas, and made the transition to full field combat conditions; and Air Force units concentrated on maintenance work.[16]

Exercise Play

According to the hypothetical situation that served as a basis for the play of Exercise SNOW FALL, an Aggressor nation had invaded northeastern United States. This attack had begun in the autumn of 1947, and by winter of that year the Aggressor held all of New England and the St. Lawrence

MAP 2



River area and had driven a wedge southwest through Buffalo, New York; Scranton, Pennsylvania; and New Haven, Connecticut. In 1950 the Aggressor had been forced to withdraw to New Brunswick, Canada, but during the summer of 1951, in a renewal of offensive operations, he advanced up the St. Lawrence River valley and recaptured Quebec and Montreal. In January 1952 an Aggressor task force crossed the St. Lawrence at Cornwall, Canada, and early in February captured Massena, New York, and pushed south to the vicinity of Potsdam.[17]

To counter this Aggressor action the United States Northeastern Theater commander formed a joint task force and directed it, first, to protect vital installations in the Carthage, New York area and, then, to destroy Aggressor forces south of the St. Lawrence River. Initially, there was to be a delaying action south of Potsdam by the 3d Armored Cavalry Regiment. After Ninth Air Force had gained sufficient control of the air, the 3d Regiment was to be reinforced by the 11th Airborne Division, which was to be airdropped and airlanded just north of Camp Drum. These Army Forces units, in conjunction with the Air Force Forces, were expected to contain the Aggressor and then undertake offensive operations to destroy him.[18]

This delaying action and the ensuing offensive constituted Exercise SNOW FALL. The general plan for the exercise called for a three-phase tactical operation. Phase I, "the build-up," lasted from 8 through 11 February, with X-day set at 9 February. On 8 February the 3d Armored Cavalry Regiment in the vicinity of Potsdam delayed the advance of the Aggressor forces. During the day the advance command groups of the Army Forces and the 11th Airborne Division parachuted into DZ's located between Camp Drum and Antwerp.* On X-day the 11th Airborne's 503d RCT made parachute and assault landings on the same DZ's. The division's 511th RCT dropped at these points on X plus 1, and its 188th RCT was airlanded (simulated) at Wheeler-Sack Army Air Field on X plus 2.[19]

Meanwhile, the delaying action by the 3d Armored Cavalry Regiment enabled the 11th Airborne Division to occupy and organize a hasty defensive position along the Oswegatchie River and anchored on the town of Gouverneur. Having delayed the enemy for three days, the 3d Regiment withdrew through this line, concluding "the build-up" phase.[20]

Phase II, "the defensive," 11-14 February, involved an additional holding action along the Oswegatchie River line while a main line of resistance (MLR) was prepared along the line Red Lake-Antwerp-East Antwerp. The Oswegatchie River line was held until early on 13 February, when it was breached by determined Aggressor attacks. However, Aggressor attacks on the MLR were steadily repulsed. On the following day, in a final effort to dislodge U.S. forces, the Aggressor employed an artillery-fired atomic projectile (simulated) against elements of the 511th RCT. Although losses were heavy, this weapon failed to smash the MLR.[21]

Phase III, "the offensive," began and ended on the same day—15 February. Offensive action by the U.S. forces was spearheaded by Task Force Mohican, composed of the 503d RCT, reinforced by one battalion of the 3d Armored Cavalry Regiment. This task force, supported by the 511th RCT on the U.S. left flank, jumped off along U.S. Highway 11, aiming its attack at the main Aggressor forces. To assist the attack, U.S. forces at 0900 dropped a simulated atomic bomb on Aggressor reserves located north of Gouverneur. At 1100 the 3d Battalion of the 188th RCT was dropped southwest of Canton† to seize this communications center and to cut the enemy's route of withdrawal. At 1215 the battalion linked up with the 3d Armored Cavalry Regiment, thus assuring the defeat of the Aggressor; and at 1305 the maneuver director terminated Exercise SNOW FALL.[22]

Air Force Operations

During the tactical phase of Exercise SNOW FALL, Air Force activity centered around fighter-bomber, reconnaissance, and troop-carrier operations. The 132d Fighter-Bomber Wing F-51's flew 65 air-superiority, 57 interdiction, and 114 close-support sorties. The fighter-bombers also flew cover for troop-carrier aircraft during the 11th Airborne Division drops.[23]

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*See Map 2.

†See Map 2.

Operations by 363d Tactical Reconnaissance Wing RF-80's and RB-26's consisted of 47 visual reconnaissance sorties and 30 photo reconnaissance sorties, with 15 of the latter being flown at night. Aerial reconnaissance was hampered by bad weather on X-day and X plus 1, but on X plus 2 full-scale, around-the-clock flying became possible. Day reconnaissance missions were flown by the RF-80's, and night reconnaissance was handled by the RB-26's. Two 363d Wing RB-26's dropped the simulated A-bomb on the final day of the exercise.* The processing and printing of aerial photos was carried out by the 363d Wing photo lab. All together, this facility processed 13,800 feet of film and produced 14,867 prints.[24]

Airborne Operations

Fighter-bomber and reconnaissance operations by Tactical Air Division (Prov) were, of course, important; much larger in size and scope, however, were the operations conducted by Troop Carrier Air Division (Prov). During the tactical phase of the exercise aircraft of the division dropped and airlanded paratroops, supplies, and equipment; engaged in assault-landing operations; and flew aero-medical evacuation missions.

On X minus 1, 6 C-119's dropped 136 Army Forces and 11th Airborne Division headquarters men and 15,120 pounds of supplies and equipment on DZ A, located approximately 10 miles north of Wheeler-Sack Army Air Field.† The drop of 1,315 paratroops of the 503d RCT was carried out on X-day by 19 C-119's and 20 C-46's. These aircraft also dropped 12,230 pounds of supplies and equipment, and the 20 C-46's airlanded 572 men. These drops and landings were made on DZ A, which was used for the X minus 1 drop, and on DZ C, located immediately to the left of DZ A. On X-day C-82's in 10 heavy-drop sorties delivered 91,486 pounds of cargo on DZ D, just south of DZ's A and C. On X plus 1, 25 C-119's and 34 C-46's dropped 1,961 paratroops of the 511th RCT and 23,400 pounds of cargo on DZ's A and C, and 10 C-82's dropped 94,738 pounds of heavy equipment on DZ D.[25]

Plans for X plus 2 operations called for the airlanding of the 188th RCT at Wheeler-Sack Army Air Field. The paratroops boarded the aircraft at Wheeler-Sack,†† but low ceiling and poor visibility forced cancellation of the mission. The paratroops remained in the aircraft and then unloaded on schedule to simulate an actual airlanding.[26]

On X plus 3, X plus 4, and X plus 5, Troop Carrier Air Division (Prov) operations were limited to small-scale supply drops and airlanding of cargo and a few personnel.[27]

The final major troop-carrier operation of the exercise was the drop of the 188th RCT's 3d Battalion. On X plus 6, 24 C-119's dropped 639 personnel and 15,000 pounds of cargo on a DZ located about two miles southwest of Canton.[28]

Assault-Landing Operations

Also a part of operations by the Troop Carrier Air Division (Prov) were the assault landings carried out by four C-122 aircraft on an assault-landing area (ALA) directly east of DZ D. On X-day seven loads of equipment were assault-landed to support the 503d RCT. On the following day 20 sorties were scheduled. However, rising temperatures had softened the ALA taxi strip; the first C-122 to land bogged down, and the remaining missions had to be canceled. On X plus 3 the C-122's transported 5,800 pounds of cargo, using Wheeler-Sack as a simulated ALA. On X plus 4, after near-zero temperatures had hardened the ground, assault aircraft flew 13 sorties into the ALA. Two C-122 sorties were flown on X plus 5; on X plus 6, the final day of the exercise, no assault missions were scheduled.[29]

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*See below, p. 35.

†For precise DZ locations see Map 2.

††Troop-carrier aircraft were based at Grenier AFB, New Hampshire, and Burlington AFB, Vermont. Wheeler-Sack wasthe staging base for all troop-carrier operations, including the airlanding of the 188th RCT at that same field.

Aerial Port Operations

The packaging, loading, lashing, and ejection of supplies and equipment carried by troop-carrier and assault aircraft were performed by the 1st Aerial Port Operations Squadron. The unit was assisted in this task by the Army's 601st Quartermaster Aerial Supply Company and 349th Transportation Aerial Port Unit. For the airborne assault operations of the 503d and 511th RCT's, the squadron prepared ¼-ton trucks and trailers, load-bearing platforms, 40-mm. antiaircraft guns, and quadruple-mount .50-cal. machine guns for airdrop and also helped load vehicles and guns that were to be assault-landed by C-122's. For airlanding operations scheduled to be carried out by the 188th RCT, the unit assisted in the preplanning of loads and the weighing of vehicles, computed center of gravity for vehicles, supervised loading and lashing, and computed weight and balance.[30]

Personnel of the 1st Aerial Port Operations Squadron also flew in C-46, C-82, and C-119 aircraft engaged in dropping supplies and equipment. For the C-46 missions aerial port squadron personnel used manual ejection methods. For the C-82 and C-119 missions aerial port squadron dropmasters employed the gravity and extraction methods of ejecting palletized loads and large aerial delivery containers. Before the missions the squadron helped prepare these containers and the load-bearing platforms.[31]

Departure Airfield Control Group

To control the movement of 11th Airborne Division unit traffic at the departure airfield, Wheeler-Sack, the division established a departure airfield control group (DACG). Operating under division control, the DACG picked up unit vehicular columns at a designated regulating point, in accordance with a movement schedule published by the division, and guided the various columns along predesignated routes to the correct aircraft. After they were unloaded, vehicles were escorted off the field by DACG personnel to a release point, where they reverted to unit control. For the airlanding of the 188th RCT, the DACG acted as the arrival airfield control group and followed, in reverse, the procedure established for control of departure airfield vehicular traffic.[32]

Air Base Group Operations at Wheeler-Sack

The task of operating Wheeler-Sack Army Air Field was assigned to the 443d Air Base Group (Advance). During the exercise this unit was responsible for base operations, flightline transportation, refueling, transient aircraft maintenance, ramp control, communications, housing and messing for the base unit and attached personnel, and air police activity. Attached to the group were an Airways and Air Communications Service detachment, which operated the control tower and ground-controlled approach, a weather detachment, and Company A, 838th Engineer Aviation Battalion. The latter unit handled snow removal and engineer maintenance at Wheeler-Sack and built the assault landing strip used by the C-122's.[33]

Aeromedical Evacuation

An important part of the troop-carrier mission in Exercise SNOW FALL was the air evacuation of casualties. Aeromedical evacuation in this exercise was of special interest because it involved the initial field testing of the 1st Aeromedical Group, an Eighteenth Air Force organization designed to provide all echelons of intratheater air evacuation service from frontline units to the rearward boundaries of the theater.[34]

During the tactical phase of the exercise the 1st Aeromedical Group evacuated casualties from ground-force forward medical facilities to Wheeler-Sack Army Air Field and from Wheeler-Sack to the Army's 2d Field Hospital at Camp Drum or to hospitals at Fort Meade, Maryland, or Fort Campbell, Kentucky. All of these points were, for the purposes of the exercise, considered to be within the theater chain of evacuation. Air evacuation to points outside the theater was carried out by the Military Air Transport Service (MATS). All patients requiring hospitalization in specialized treatment

facilities within the zone of interior (ZI) were evacuated by the 1st Aeromedical Group to its casualty staging flight at Griffiss AFB, the MATS theater air terminal for the exercise. Here they were turned over to routine or special MATS air evacuation flights in accordance with established ZI evacuation policy.[35]

Evacuation from the forward areas to Wheeler-Sack was carried out by four H-19 helicopters of the 5th Air Rescue Squadron.* The so-called lateral evacuation from Wheeler-Sack to medical facilities within the theater was performed by the H-19's and by troop-carrier aircraft of Troop Carrier Air Division (Prov). The H-19's transported patients to the 2d Field Hospital at Camp Drum; C-46's and a C-124 made evacuation flights to Fort Meade and Fort Campbell; and C-46's and C-122's were used to carry patients from Wheeler-Sack to the MATS theater air terminal at Griffiss. Preparation of patients for flight, loading, offloading, and in-flight care was accomplished by flight nurses, medical technicians, and other personnel of the 1st Aeromedical Group. In all, 181 casualties were evacuated from forward areas to Wheeler-Sack; 361 patients were airlifted from Wheeler-Sack to the various intratheater facilities; and 159 were lifted from Wheeler-Sack to Griffiss.[36]

Communications

Air Force control and communications facilities for Exercise SNOW FALL were installed and operated by the 151st Aircraft Control and Warning (AC&W) Group and a detachment from the 104th Communications Construction Squadron. For the tactical air control system the 151st AC&W Group furnished a TACC at Camp Drum; one TADC at Dry Hill, in the vicinity of Watertown, New York, and another at Griffiss AFB; an L/W radar at Wheeler-Sack; a VHF D/F net at Griffiss, Oswego, and Camp Drum; and FM radio relay stations at Cold Point, Turin, and Boonville, all in New York. In addition, the 151st Group, with the help of the 507th Tactical Control Group, manned and equipped 14 TACP's. Point-to-point radio, telephone, and teletype communications between Air Force Forces, Troop Carrier Air Division (Prov), Tactical Air Division (Prov), and the operating units were provided by the 104th Communications Construction Squadron detachment.[37]

Atomic Weapons Operations

The tactical employment of atomic weapons was included as a part of Exercise SNOW FALL. The concept for atomic play was approved by the maneuver director on 21 December 1951. Shortly thereafter, Northeastern Theater headquarters prepared for the joint task force commander a directive governing the employment of atomic weapons and sent letters of instruction to the Army Forces and Air Force Forces commanders. On 26 December the Air Force Forces published the special weapons annex to its Operation Plan 1-51. The special weapons annex to the Army Forces Operation Plan 1-52 was published on 6 February 1952. Final plans for the selection of atomic targets and the times for the attacks were prepared on 13 February.[38]

The planning and direction of atomic play at maneuver director headquarters level was carried out by the special weapons branch of the J-3 section's special projects division. The mission of the special weapons branch was to 1) plan the concept and conduct of atomic play, 2) develop a means of simulating an atomic weapons attack, 3) provide the staff sections, the umpire group, and the participating units with technical advice and assistance on all matters pertaining to the employment of atomic weapons, and 4) develop methods of assessing casualties and means of umpiring atomic weapons effects.[39]

During the course of the exercise two simulated atomic weapons were employed. In the first instance, a simulated atomic shell was fired by Aggressor artillery (simulated) at 1205 on X plus 5 (14 February) and exploded in the 511th RCT sector at a point about 1,000 yards south of Hall's Corners.† When an intelligence report, forwarded through channels and carefully evaluated at each

*The Army was responsible for air evacuation of casualties from frontline areas to the ground-force forward medical facilities, where they were picked up by the Air Force H-19's. Army air evacuation was handled by H-13 helicopters of the 6th Transportation Helicopter Company.

†See Appendix 4.

level, indicated the presence of a particularly lucrative target and after a visual and photo air reconnaissance of the target area, the Aggressor army forces commander had approved the proposal to use the atomic weapon. In the second case, a simulated atomic bomb was dropped at 0930 on X plus 6 by friendly air on Aggressor reserves located north of Gouverneur.* The request to use an atomic bomb was processed by the air operations center (AOC) on X plus 5 and was tentatively approved by the joint task force commander, who was responsible for making the final decision as to whether or not to employ the bomb. On the following morning, after visual air reconnaissance had verified the target, he ordered the dropping of the atomic bomb.[40]

To simulate the explosion of each of these weapons, the following devices were used: 1) one M-47 special-fill photoflash bomb, dropped by an RB-26 aircraft and timed to burst at an elevation of 1,000 feet; 2) eight 55-gallon tanks of titanium tetrachloride (smoke), dropped by four F-51 aircraft to create a large smoke cloud at an elevation of 500 feet, 3) white phosphorus grenades and four 25-pound charges of TNT, detonated on the ground to drive the smoke upward in the characteristic mushroom conformation; and 4) two 8-inch pyrotechnics, fired to burst in the smoke cloud.[41]

Special instructions to all umpires called for the assessment of casualties inflicted by the atomic explosions. To supervise this task, four umpires were given a special briefing and each was assigned a quadrant of a circular terrain area with a radius of 5,000 yards from ground zero of the contemplated air bursts. All umpires within this area were issued scoring cards for the assessment of unit casualties. Assessment of losses was based on the distance of units from ground zero of the burst and the degree of protection of personnel and materiel at the instant of burst. Using this scoring system, the umpires estimated that the U.S. forces had suffered 44.3 percent casualties from the X plus 5 burst and that the Aggressor had sustained 41 percent losses from the X plus 6 explosion.[42]

*See Appendix 4.

CHAPTER IV

EXERCISE SNOW FALL—FINDINGS

Although Exercise SNOW FALL was conducted on a much smaller scale than its predecessor, Exercise SOUTHERN PINE, its activities covered a wide range of tactical air operations. The exercise produced a number of important findings in the fields of planning and organization; close-support, reconnaissance, and airborne operations; communications and electronics; and the tactical employment of atomic weapons. And, of course, lessons were learned from operating under conditions of snow and severe cold.[1]

Planning

Exercise SNOW FALL was characterized generally by smooth and efficient joint planning. After the exercise Lt. Gen. Willis D. Crittenberger, the maneuver director, stated that "on the command, planning, and control level, a high record of accomplishment resulted from the close accord and understanding that existed between the . . . Army and the Air Force. Never in my military service have I seen it better." A similar view was expressed by Brig. Gen. Homer L. Sanders, the Air Force Forces commander, who noted especially the absence of interservice controversy.[2]

Organization and Command Structure

Joint planning was not, however, completely harmonious. There is some evidence that planning was disrupted by a disagreement between the Army and the Air Force over the command structure for the exercise, a dispute that centered around the establishment of a joint task force. On 17 November 1951 the maneuver director published Annex 1 of the general plan for the exercise. This annex, titled Command Responsibilities and Organization, called for the formation of a joint task force, which was to be placed under the Northeastern Theater commander (maneuver director). The maneuver director in a letter of instructions to Commanding General, 11th Airborne Division, named him joint task force commander, and in a letter of instruction to the Northeastern Theater air commander (Commanding General, Eighteenth Air Force) directed him to make available to the joint task force one provisional troop-carrier division and one provisional tactical air division.[3]

The use of a joint task force was evidently unacceptable to Tactical Air Command (TAC). In the first place, it was inappropriate for a SNOW FALL type of operation, an operation that could be carried out under a normal theater organization.[4] In the second place, Air Force units were being placed in a joint task force that was under the 11th Airborne Division commander and was staffed by a joint staff, the Army portion of which was to be drawn also from the 11th Airborne Division.[5] It would seem that TAC was bound to oppose such an arrangement since it would, in effect, have placed Air Force units under the operational control of an Army division commander.

It was true that in Exercise SOUTHERN PINE, TAC had agreed, somewhat reluctantly, to assign troop-carrier aircraft to a joint task force for the airborne phase of the exercise, a task force that, like the one the Army proposed for SNOW FALL, was commanded by the airborne division commander.* But there was an important difference. The command structure originally proposed for SNOW FALL would have placed not only troop-carrier aircraft but also, in the form of a tactical air division, fighter-bomber and reconnaissance aircraft under a joint task force organized on the Army side at division level and commanded by a division commander. Evidently it was this ramification

*See above, pp. 3, 21-22.

of the Army-proposed command structure that prompted TAC's commander, General John K. Cannon, to assert that the Army's desire for a joint task force in SNOW FALL was a subterfuge to allow the Army to exercise control of tactical air.[6]

In a compromise reached between Tactical Air Command and Office, Chief of Army Field Forces (OCAFF), the joint task force organization favored by OCAFF was retained, and to remove some of TAC's objections it was formed at a higher level.* The maneuver director, rather than the 11th Airborne Division commander, was designated as joint task force commander; and the Army members of the maneuver director's staff,† rather than the 11th Airborne Division staff, formed the Army portion of the joint task force staff. From the Air Force point of view this represented an improvement; the joint task force was removed from any semblance of division control, and the joint task force commander exercised control of air units not directly but through the joint task force air commander.

The Tactical Air Command compromised, when it agreed to the formation of a joint task force to which air units would be assigned, despite its view that for a SNOW FALL type of operation such an arrangement was unnecessary and represented a needless parceling out of theater air forces.

The compromise by OCAFF lay in its agreement to establish the joint task force at a higher level and to remove any vestige of control of tactical air at the division level. Placing the joint task force at a higher level meant also that there would be no joint task force at the operating level for the airborne phase, such as the joint airborne task force employed in Exercise SOUTHERN PINE, an omission that was sharply criticized by the 11th Airborne Division commander.††

During the exercise itself the organization that was finally agreed on seems to have functioned reasonably well. However, day-by-day planning for tactical air operations was hampered because the air operations center (AOC), the equivalent of a joint operations center (JOC), did not have direct access to the Army Forces commander. The AOC was established at Air Force Forces-Army Forces level and located at Camp Drum, adjacent to the rear Army Forces headquarters. The Army Forces commander, in order to insure better control of his tactical units, set up an advance command post (CP) in the field, where he was separated from the Air Force Forces commander and from the AOC. To overcome this difficulty a deputy commander was appointed and stationed at the rear Army Forces headquarters to act for the Army Forces commander in joint matters. Thus the Air Force Forces commander worked directly not with his opposite number but with his deputy. A better arrangement would have been to establish the AOC in the field, near the forward Army CP, where there could have been closer coordination of air-ground operations and where AOC personnel could have received training in camouflage and security measures.[7]

Air Force Operations—Close Support

Air Force activity during Exercise SNOW FALL centered around close-support, reconnaissance, and troop-carrier operations. The most serious Air Force deficiency in the field of close support was the unsatisfactory performance of the tactical air control parties (TACP). The difficulty lay not with the controllers themselves but with the obsolete jeeps and radio sets. Equipment failure had plagued the work of the controllers in Exercise SOUTHERN PINE,††† and this problem cropping up again in SNOW FALL was made even more acute by adverse weather conditions. The TACP jeeps arrived at Camp Drum not winterized, and in poor mechanical condition. Their winterization and maintenance consumed valuable training time that should have been used to familiarize personnel with cold-weather operations.[8]

It was found, moreover, that the jeep was too small to carry the equipment necessary for the cold-weather operation of the control parties. Radio equipment and personnel with their individual

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*See Chart 2.

†The Army staff members were drawn largely from First Army.

††See below, p. 44.

†††See above, pp. 22-23.

cold-weather gear so overloaded the jeeps that frequently they were unable to get into position through the deep snow. The exercise offered ample evidence of the need for an improved TACP vehicle. Control party officers suggested that the ¾-ton truck equipped for cold-weather operations might be the answer to this problem.*[9]

Close-support operations were hampered by certain Army shortcomings. Effective close support depends in large measure on the smooth functioning of the Army's request system—the air-ground operations system. In Exercise SNOW FALL the Army machinery for requesting air support failed to measure up. Because of poor communications there were frequent breakdowns in the air-request net, and the efficient processing of requests at AOC level was difficult because of inexperienced Army personnel in the air-ground operations section.[10]

A more fundamental difficulty, according to Air Force reports on the exercise, was that ground commanders did not plan carefully the use of tactical air available for their support. During the first few days of the exercise there were no preplanned requests for close-support or reconnaissance missions received by the G-2 and G-3 air officers at the AOC. In order that the available air effort be used, requests had to be initiated by these officers in the AOC. Approximately 50 percent of the close-support missions flown for each major ground unit were laid on by AOC rather than at the request of the units. There is no indication that ground commanders deliberately avoided the use of close support, but there did seem to be a lack of staff planning and an ignorance of request procedures and the responsibilities of the requesting units.[11]

A similar point of view was reflected in the report of the maneuver director's assistant chief of staff J-3, an Army officer. The lack of preplanned requests during the early days of the exercise was attributed partly to the 3d Armored Cavalry Regiment, which for security reasons, had imposed radio silence, thus hampering the forwarding of requests. But that the Army units were not fully prepared to carry out their responsibilities in the requesting of air support is indicated in the report's recommendation that in all command post exercises and field training ground units should be given instruction in the workings of the air-ground operations system and in the proper methods of requesting air support.[12]

According to Ninth Air Force, the Army was open to criticism for providing only a meager flow of intelligence information from lower Army units. Generally, friendly air had no knowledge of the location of friendly army units; hence, it was necessary to place the bombline at excessive distances from the frontlines. As a result many targets for air attack were lost.[13]

As in Exercise SOUTHERN PINE,† close-support operations included the use of jet reconnaissance aircraft (RF-80's) for airborne control of fighter-bomber strikes. Ten Mosquito-type sorties were flown by the 363d Tactical Reconnaissance Wing's 17th Squadron with satisfactory results.

A Mosquito sortie flown on the morning of 7 February produced a number of important findings. The pilot when flying at an altitude of 1,000 to 1,500 feet, maintaining an airspeed of 370 mph, and using a rocking motion of the aircraft, secured the best possible visibility. The advantages of using the RF-80 in the Mosquito role were in its excellent visibility, the element of surprise it could insure, and its ability, because of speed and maneuverability, to avoid enemy aircraft and ground fire. On the debit side was the aircraft's high rate of fuel consumption that sharply limited the amount of time the aircraft could spend in the target area. Mosquito operations using the RF-80 required very careful flight planning, since the pilot, in order not to waste any of his limited time in the target area, had to be able to pinpoint his location at all times. A further disadvantage was that in the single-place RF-80 the pilot had to do both the observing and the flying. It was discovered also that the maps were too bulky for use in the small cockpit space of the RF-80, and the development of a compact, large-scale map, in notebook form was recommended.[14]

*For a discussion of TACP communications see below, pp. 45-46.

†See above, p. 16.

Aggressor Close-Support Operations

Aggressor close-support operations were carried out by 12 F-51's drawn from the 132d Fighter-Bomber Wing. These operations were characterized by a considerable lack of realism. In the first place, the Aggressor fighter-bombers were drawn from the U.S. forces fighter-bomber unit, the 132d Wing. In the second place, because Aggressor and U.S. aircraft operated from the same base--Griffiss AFB--each could observe all activities of the other. From the standpoint of Aggressor air, the use of Griffiss was unrealistic also in that it was located in enemy (U.S.) territory, many miles behind the U.S. forces' frontlines. A degree of realism was achieved by requiring Aggressor aircraft to make their penetrations of the U.S. zone from the east or northeast in order to create the illusion that the aircraft were coming from the Aggressor rear areas. There were occasions when the weather was bad at Griffiss but good in the rear of Aggressor frontlines, yet Aggressor aircraft could not fly because Griffiss was weathered in.[15]

Effects of Cold Weather on Fighter-Bomber Operations

From the experience of Exercise SNOW FALL it was possible to assess the effects of cold weather upon fighter-bomber operations. It was found, for instance, that ice and snow did not affect scramble times, since the taxiways and runways at Griffiss AFB were nearly always cleared when the fighter-bombers were operating. The main problem during scramble missions was starting aircraft engines and warming them up before takeoff. Units of the 132d Fighter-Bomber Wing also reported the following findings typical of cold-weather operations:

1) Winter clothing supplied to ground crewmen who had to work outside for long periods of time was regarded by all as inadequate.

2) The C-21 and C-22 auxiliary power units (APU) were difficult to move by hand on snow or ice-covered ramps, indicating a need for more tugs.

3) Ice and wet snow frozen on the sides of the fuselages, vertical stabilizers, and wing surfaces could be easily removed by using the heads from the F-4 engine heaters.

4) Aircraft propellors developed numerous oil leaks during the oil dilution periods.

5) Wooden chocks froze to the ramp during the night.

6) Metal antenna stakes crystallized because of the extreme cold, and it was difficult to drive the stakes without breaking or damaging them.

7) Shorter work periods and longer rest periods had to be established.[16]

Reconnaissance

Tactical reconnaissance operations in Exercise SNOW FALL produced worthwhile training and at the same time revealed certain weaknesses, some attributable to the Air Force and some to the Army. Daylight reconnaissance missions flown by the 17th Tactical Reconnaissance Squadron were performed with a minimum of difficulty, but night reconnaissance carried out by the 16th Tactical Reconnaissance Squadron, Night Photo was hampered by the failure of night photo equipment.

Exercise SNOW FALL was welcomed by the 16th Squadron, since it afforded an opportunity to perform actual night photo missions, hitherto not possible for the squadron because of the lack of a suitable bombing range. However, the effectiveness of these missions was seriously impaired by the malfunctioning of the A-3 cartridge ejection system and the A-14 film magazine. The A-3 cartridge ejection system failed to work properly on the first mission, and at no time was its performance satisfactory. Failure to fire and failure to eject were the most common malfunctions, and the trouble was diagnosed as crystallization of wiring in the electrical relays. The A-14 film magazine, because of the failure of the clutch mechanism controlling the movement of the film between exposures, was not reliable for more than one mission. A further complication was that maintenance personnel were unprepared to correct these various deficiencies. At the completion of the second night's flying, only one of the eight A-14 magazines and two of the three A-3 cartridge ejection systems were operating.[17]

Exercise SNOW FALL was characterized by a general lack of understanding of the limitations and capabilities of tactical reconnaissance, particularly on the part of the Army. Army units failed to make full use of Air Force reconnaissance. The large majority of Army requests originated in the G-2 air reconnaissance section of the AOC rather than at Army Forces headquarters or with Army units in the field. As a result the missions flown were not necessarily the ones required by those actually doing the planning or by the frontline units. Still, it was believed necessary to follow this practice so that reconnaissance units could receive sufficient training.* Despite the use of this expedient the full Air Force reconnaissance capability was not employed. During the entire exercise only one night target was assigned by the AOC to the 16th Tactical Reconnaissance Squadron, Night Photo; all other night photo missions were flown against targets of opportunity.[18]

There seemed to be among Army personnel a general lack of understanding of the correct method of completing the reconnaissance request form. Photo requests frequently specified the type of aircraft and the type of camera to be employed, matters that are properly the province of the reconnaissance unit. On the other hand, the requests often made no mention of the purpose for which photographs were needed. This information would have aided greatly the scanning of negatives to determine their adequacy.[19]

A more serious omission was the failure to man fully the Army portion of the joint air photo center (JAPC). Especially damaging to the effective operation of the JAPC was the Army's failure to provide a photo interpreter team. Since Army interpretation could not be performed at the JAPC at Griffiss AFB, photographs were flown to the Army G-2 air reconnaissance officer in the AOC at Camp Drum for interpretation, a procedure that prevented the rapid dissemination of vital intelligence information. The delay ranged from 1 to 24 hours, depending on the weather, and tended to create an unfavorable impression of the capabilities of Air Force reconnaissance. There seems to be little doubt that more active participation in the JAPC by Army interpreters could have improved the timeliness of intelligence received from Air Force reconnaissance sources.[20]

A further hindrance to smooth reconnaissance operations was the failure of maneuver director headquarters to submit a request for basic photo coverage of the maneuver area until after the reconnaissance unit was at its maneuver base and the training phase had begun. As a result of the tardiness of this request there was a complete saturation of the limited printing facilities at Griffiss AFB, a situation that could have been avoided, if the coverage had been flown before the start of the exercise by aircraft operating from their permanent base and the photos processed by a photo lab possessing complete facilities.[21] The responsibility here cannot necessarily be laid at the door of the Army. Maneuver director headquarters was a joint organization, with both Army and Air Force personnel manning the J-2 section, which, of course, had photo intelligence responsibilities. The person immediately concerned was the J-2 photo intelligence officer, who was from the Army; however, the individual ultimately responsible, aside, of course, from the maneuver director, was the assistant chief of staff J-2, an Air Force officer.

Aerial Reconnaissance over Snow-Covered Terrain

Exercise SNOW FALL, it is true, revealed certain weaknesses in the field of aerial reconnaissance. But the exercise was also of positive value, for it taught important lessons regarding the conduct of reconnaissance operations over snow-covered terrain. In daylight photo reconnaissance it was found that camera lens settings had to be changed to allow for the greater reflectivity of light-colored subjects. When photographing light-colored subjects at night, the distance from the subject had to be increased if the lens setting and exposure time remained constant. For example, in using the A-3 cartridge ejector system when there was no snow, the best results were secured by flying at an altitude of about 3,100 feet, but this figure had to be increased to from 3,500 to 4,000 feet when photographing a snow-covered target.[22]

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*The Army, it will be recalled, was similarly remiss in its use of close support. See above, pp. 37-38.

Daylight visual reconnaissance was greatly simplified by snow, which made tracks and movement easily discernible. Vehicles and other dark objects were difficult to hide because of the sharp contrast they presented to the white background. Identification of targets during the night visual reconnaissance missions was simplified but not to the same extent as during day missions since tracks and marks in the snow were not visible under the normal light of the moon and the reflection from the clouds. When there was snow, night area and route reconnaissance were simplified because of the increased reflectivity. Even dark objects offered a contrast by moonlight against the light background. However, if the reflectivity of the snow permitted vehicles to drive without lights, there was a sharp reduction in the effectiveness of aerial observation.[23]

Working with photos of an area covered with snow taught some lessons to photo interpreters and to those who developed the film. They learned that the task of photo-interpretation was simplified because of the contrast afforded by the snow and because movement was easily discernible, especially in freshly fallen snow. The development of snow prints presented special problems. There was a tendency on the part of personnel in the photo lab to overcorrect the exposures, a practice that resulted in overexposed negatives. The situation could likely have been avoided if the photographers had filled out their photo logs completely, giving full weather data indicating whether the photo had been taken under conditions of haze, fog, smoke, bright sun, or clouds. Such information was vital if film developers were to use the correct developing time and the proper paper. It was noted that in printing mosaics of varying degrees of snow coverage four contrasts of paper were required.[24]

Troop-Carrier Drops

Airborne operations in Exercise SNOW FALL, according to Brig. Gen. Homer L. Sanders, the Air Force Forces commander, were "entirely successful."[25] And Brig. Gen. Arthur L. McCullough, commander of Troop Carrier Air Division (Prov) reported that most personnel of the division had increased their troop-carrier knowledge, that much valuable staff experience had been gained, and that formation flying and drops by all units had improved as the exercise progressed.[26]

In only a few instances during the three major personnel drops was the troop-carrier performance less than satisfactory. During the X-day drop of the 503d RCT most of the serials flew on course, arrived at the DZ's on schedule, and made accurate drops. However, the first and second serials of this drop, carrying respectively in single aircraft the pathfinder teams for DZ C and DZ A, misjudged the wind and flew courses to the left of the DZ's. Consequently, both pathfinder teams landed off their DZ's. Wind in excess of 15 miles per hour, which was set by the 11th Airborne Division commander as the upper limit for safe jumping, prevented two other serials from dropping.[27]

During this X-day mission there appeared to be an excessive number of free-falling objects. Investigation revealed two principal causes. First, one monorail of 20 bundles fell free because of a broken cable, a circumstance that might not have occurred if the cable had been given a careful preflight check. Second, many bundles of individual equipment fell free because of the paratroops' failure to lash them properly and secure the lashings to their belts.[28]

The heavy drop executed on X-day was satisfactory except for the selection of the release point, which had been chosen without taking the tailwind into account. As a result, several loads landed dangerously close to persons on the DZ and at the spectator observation post (OP).[29]

The drop of the 511th RCT on X plus 1 was nearly perfect. With one exception all serials made their drops on schedule and on the designated DZ's. The last serial flew slightly to the left of the prescribed course and over the spectator OP. Apparently the pilots, to avoid dropping on the OP, hesitated momentarily in giving the green light and activating the monorails, and the releases were made over a mass of paratroops already on the ground. One bundle broke free and fell in the midst of this group. It was evidently this bundle that fatally injured one of the paratroops. The day's activity was also marred by the crash of a C-46 on takeoff. Four crew members were killed and one paratrooper was seriously injured.[30]

There were no outstanding deficiencies or unusual incidents in connection with the drop of the 3d Battalion of the 188th Airborne Infantry Regiment on X plus 6. The mission was accomplished on schedule and with excellent results.[31]

Two troop-carrier formations were used during these missions—Vee of Vees and Vees in trail, the former for heavy-equipment drops and the latter for personnel drops. The Vees in trail formation was used for safety reasons rather than because it was the soundest troop carrier-airborne formation. The Vee of Vees formation is usually preferred, particularly in large-scale troop-carrier operations, because it makes possible the concentration of force and facilitates fighter protection. If the tactical situation permits, aircraft flying in Vee of Vees formation can make simultaneous drops on more than one DZ.[32]

Assault-Landing Operations

Assault-landing operations were carried out by C-122 aircraft of the 16th Troop Carrier Squadron, Assault (L). The performance of this squadron was watched with particular interest because this was the first time its C-122 assault aircraft had been committed to a cold-weather operation. The mission of the C-122 was to airland personnel, equipment, and supplies on unprepared fields in forward combat zones and to evacuate personnel and equipment.

In Exercise SNOW FALL semiprepared fields were used for assault-landing operations, and the C-122 performed satisfactorily so long as the ground remained frozen. However, when a thaw set in, the softness of the ground would not permit landings. As a solution it was suggested that the C-122 be equipped with skis or that instead of clearing the landing strip, some method of packing the snow be developed.[33]

To the 314th Troop Carrier Wing, parent organization of the 16th Squadron, the experience of SNOW FALL, combined with the experience of other exercises, attested the limited ability of the C-122 to perform the assault mission. In SNOW FALL the C-122 mired down in the mud and slush because the landing gear could not sustain the weight of the aircraft on soft ground. There was a need, according to the 314th Wing, for a smaller, lighter aircraft with a lighter footprint pressure that might possibly be provided by the use of the swamp-buggy type of landing gear and large doughnut-type tires. The 314th Wing was disturbed by the Air Force's failure to develop a satisfactory assault-type aircraft, claiming that the Air Force had come up with no aircraft that was an improvement over the old C-47.[34]

Aeromedical Evacuation

In Exercise SNOW FALL, as in Exercise SOUTHERN PINE, troop-carrier operations involved a certain amount of interservice controversy over aeromedical evacuation, operation of aerial ports, and the use of the joint task force organization for troop carrier-airborne operations. The status of the dispute over aeromedical evacuation was essentially the same as it had been at the time of Exercise SOUTHERN PINE. The Air Force claimed primary responsibility for air evacuation of casualties both within the combat zone and from the combat zone to points outside, and the Army claimed that air evacuation within the combat zone was an Army responsibility.

Unable to find a permanent answer to this problem, OCAFF and TAC once again agreed to a local solution or compromise, applicable only to Exercise SNOW FALL. In Exercise SOUTHERN PINE the Air Force and the Army were responsible for the aeromedical evacuation of an approximately equal number of U.S. forces combat units.* A different arrangement was worked out for SNOW FALL. Air evacuation in the forward areas was performed by Army helicopters that carried patients from the frontlines to an Army forward medical facility. Air evacuation from this point was carried out by the Air Force.

This local solution proved to be satisfactory, and Air Force and Army units worked together in harmony. From the Air Force viewpoint, however, the system of evacuation was open to criticism, chiefly because of the Army requirement that patients go through every link in the chain of evacuation—battalion aid station, collecting station, clearing station, casualty staging facility at Wheeler-

*See above, pp. 33-34.

Sack, Camp Drum station hospital. Using this system, it took about three hours to evacuate a patient from time of injury to arrival at Camp Drum station hospital—a distance that was usually not more than 12 miles. According to the chief medical umpire, an Air Force officer, this time could have been reduced by as much as two-thirds by eliminating some of the unnecessary links in the evacuation chain.[35]

The use of the entire evacuation chain, the chief medical umpire pointed out, was inherently wasteful of time and personnel. He felt that in light of developments in the technique of air evacuation, such links as collecting and clearing stations and mobile army surgical hospitals (MASH) "are obstructions in the humanitarian goal of getting the patient to definitive treatment centers in the best possible physical condition in the shortest time span."[36] As a solution it was recommended that casualties be picked up at the battalion aid station by helicopters or assault aircraft and flown to a casualty staging facility, which could be located anywhere from 10 to 100 miles from the aid station. Emergency treatment of injuries and shock initiated at the battalion level could be continued there, and patients needing further treatment could be flown from the casualty staging facility to fixed hospital installations in the rear.[37]

A different view was presented by the Army surgeon who was the chief medical officer working under the J-4 section of maneuver director headquarters. It was his opinion that aside from the desire to furnish training for each echelon of the evacuation chain, there was no need for stopping at each point while moving casualties to the rear. There would be times, depending on such factors as distance, weather, air superiority, and the tactical situation, when patients could be transported by helicopter from the battalion aid station direct to a fixed installation in the rear. However, this officer believed it was inadvisable "to alter any concepts of medical support since, at present, the use of ambulances, collecting, clearing, and MASH will always be required in the average tactical situation."[38] Still, in the conclusion to his report the Army surgeon, commenting on the inefficient use of helicopters in SNOW FALL, mentioned the need for "the Army and Air Force working at policy level to develop a plan of evacuation that will from cost and time standpoint, develop a more efficient method of using this means of air evacuation with probable changes of the system of evacuation."[39]

Although Exercise SNOW FALL contributed little to the solution of interservice differences in the field of aeromedical evacuation, it did provide the first field test of the 1st Aeromedical Group. The operations of this group, according to the Troop Carrier Air Division (Prov) commander, proved to be essential to the effective performance of the intratheater air evacuation mission; they contributed to the saving of lives and cleared from the battlefield casualties that would otherwise have been an extra burden to frontline commanders.[40] The chief medical unpire rated the overall performance of the group as superior.[41]

Aerial Port Operations

Aerial port operations, which the Air Force claimed as its responsibility and which the Army claimed was the province of its Quartermaster Corps and Transportation Corps, were conducted on a cooperative basis by the 1st Aerial Port Operations Squadron, an Air Force unit, and by the Army's 601st Quartermaster Aerial Supply Company and 349th Transportation Aerial Port Unit. Although this arrangement proved satisfactory, it did little to clarify the problem of control of aerial port operations.[42]

In SNOW FALL the Air Force position relative to this question was weakened by the fact that the 1st Aerial Port Operations Squadron, a newly activated unit (20 November 1951), was short of equipment, especially heavy-loading equipment, and was forced to turn to the Army for assistance. It was this situation that led Headquarters, Air University, in a letter reviewing the results of the exercise, to ask of Headquarters USAF: "Why, then, in a controversial issue of this nature, do we go into another maneuver and strengthen the Army's position by our failure to provide the necessary equipment to the 1st Aerial Port Operations Squadron?" It was suggested that in future joint maneuvers the Air Force either supply the forces to carry out aerial port operations or, if it was necessary

to ask the Army for assistance, secure in the form of a directive from the maneuver commander clear recognition of the Air Force's primary responsibility in this field.[43]

Command Structure for Airborne Operations

The third area of interservice disagreement concerned the problem of command structure for airborne operations. It was pointed out earlier that although a joint task force structure was established for the exercise as a whole, there was no joint task force set up at airborne-troop carrier level.* Such a force was formed for Exercise SOUTHERN PINE, but in SNOW FALL airborne operations were carried out on a cooperative basis by airborne and troop-carrier headquarters, which were located in close proximity.

It was the opinion of Brig. Gen. Ridgely Gaither, commander of Army Forces and also of the 11th Airborne Division, that the failure to establish a joint headquarters at 11th Airborne Division–Troop Carrier Air Division (Prov) level delayed the solution of problems and the making of decisions on joint planning details. Planning had to be done by cooperation and coordination and with command and staff liaison, a method General Gaither considered to be "slow and undesirable."[44]

The Air Force view on this matter was reflected in the comment by Brig. Gen. Homer L. Sanders, Air Force Forces commander, that planning was greatly facilitated because of the short distances separating the headquarters of the Troop Carrier Air Division (Prov) and the 11th Airborne Division. General Sanders believed that the close coordination achieved by frequent two-way visits made it possible to eliminate differences quickly and helped mold the airborne-troop carrier team "into a striking force of maximum efficiency."[45] A similar position was taken by the maneuver director, Lt. Gen. Willis D. Crittenberger, an Army officer. Speaking at the critique, General Crittenberger stated that in the interest of close accord and efficiency the headquarters of the airborne division, the provisional troop-carrier division, and the provisional tactical air division were all located together. "This physical proximity," he said, "paid dividends, and could well be emulated in future maneuvers. This nearness of airborne and troop-carrier headquarters lent itself well to early decisions on drops, and other plans dependent upon last minute weather reports."[46]

Departure Airfield Control Group

Although the majority of the key commanders viewed the command structure for airborne operations as a sound one, there was evidence that joint control of operations at the departure airfield, Wheeler-Sack, was unsatisfactory. In Exercise SOUTHERN PINE a departure airfield control group (DACG), composed of airborne and troop-carrier personnel, coordinated the details of aircraft parking and loading and supervised troop and vehicular movement at the departure airfield. The work of this central control agency was highly praised by both services and its use was recommended for future exercises.†

Although a DACG was formed for Exercise SNOW FALL, it was entirely an 11th Airborne Division organization used primarily for control of division vehicular traffic during loading and unloading. The limited scope of its operations and the lack of Air Force representation hampered the work of the group and resulted in a certain amount of confusion at Wheeler-Sack, further complicated by the lack of a joint airborne-troop carrier CP to supervise operations. The 11th Airborne Division and Troop Carrier Air Division (Prov) headquarters were not convenient to the airfield, and there was no on-the-spot joint control of the out-loading. The DACG functioned at times in the capacity of the airborne portion of the joint CP, but there was no troop-carrier counterpart and, of course, no troop-carrier representation on the DACG that would have enabled it to function as a sort of joint CP.[47]

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*See above, pp. 36-37. See also Appendix 3.

†See above, pp. 15-16, 20.

Effects of Cold Weather and Snow on Troop-Carrier Operations

One of the purposes of Exercise SNOW FALL was to provide experience in cold-weather operations. Of special interest to the Air Force was the performance of its troop-carrier units under conditions of extreme cold. The training phase of the exercise was hampered by unseasonably warm weather and by rain and mud, but on X minus 1, X-day, and X plus 1, when most of the airborne activity took place, the temperatures were below zero, and the ground was heavily covered with snow. SNOW FALL thus provided an excellent cold-weather test for airborne operations.[48]

A significant finding relative to troop-carrier operations under these conditions was that aircraft marshaling problems are greatly increased in cold weather and in ice and snow. Dispersal required that clearings be cut through the snow for each aircraft, clearings large enough so that each aircraft could turn around safely by its own power in order to eliminate the need for a tow bar and crew. When the airfield was covered by ice or packed snow it was necessary to use a lower rpm setting, which slowed down marshaling activities. Efficient snow-removal and sanding operations were difficult to sustain.[49]

None of these difficulties proved insurmountable. Company A of the 838th Engineer Aviation Battalion cleared the runways of snow and did much to insure continuous airfield operation. No satisfactory means of removing thin ice from the runways were found, but sanding helped and permitted almost normal operations. Because of careful taxiing and handling of aircraft, takeoffs and landings on the slippery runways were less troublesome than had been anticipated.[50]

Communications

Training exercises ordinarily reveal numerous deficiencies in communications. Indeed, communication failures are almost a chronic condition. Exercise SNOW FALL, however, was something of an exception. The J-5 (communications) officer of maneuver director headquarters reported that in general communications were excellent, and Ninth Air Force found that with the exception of minor breakdowns communications functioned well throughout the operational phase of the exercise.[51]

The communication and electronic apparatus of the tactical air control system was used effectively. The speed with which the tactical air control system could be modified because of enemy action was demonstrated on 12 February, when the AOC and the TACC were put out of action by an Aggressor fighter attack. In accordance with a prearranged plan control was shifted to the TADC at Dry Hill, and within 12 minutes all necessary circuits were working.[52]

Deficiencies in the control system were confined largely to certain aspects of radar operation, to the failure of power units, and to tactical air control party communications. The most important radar problem was the lack of adequate low-level coverage, but there were also a number of minor breakdowns of radar equipment, most of which took place early in the day after the equipment had been shut down during the night. Equipment that operated around the clock was more reliable. On the whole, the equipment held up because of adequate backup, overlapping coverage, and good maintenance by enthusiastic technicians. As the exercise progressed, operator proficiency increased. But there remained a need for further training in operator and telling technique, quick identification, plotting, and reporting of targets to the TACC.[53]

Power unit failure was particularly troublesome. Gasoline generators frequently broke down when water froze in the feed lines or when inexperienced attendants failed to operate and maintain the units correctly. Only by keeping the units in heated tents could the first difficulty be corrected. For example, the PU-31 equipment for the radar held up satisfactorily because it was placed inside a warm shelter.[54]

The most serious communication deficiency was the breakdown of TACP equipment, chiefly the over-age jeeps* and the jeep-mounted AN/VRC-1 radio used for air-ground communication. AN/VRC-1 failure was attributed mainly to moisture in the radio sets caused by rain and snow. The

*See above, pp. 37-38.

TACP coordinator for the exercise reported that neither of the major components of the AN/VRC-1 was satisfactory. The SCR-522 VHF radio used for air-to-ground communication did not stand up under the rough treatment in the field, and its four channels were insufficient for aircraft control. The SCR-191 HF radio, used for point-to-point communication required too much space, and the average radio mechanic had difficulty repairing it in the field. The TACP coordinator recommended that both of these sets be replaced, the SCR-522 by the AN/ARC-3 and the SCR-191 by the AN/ARC-8, a ten-channel set.[55]

Airborne operations also brought out the need for improved communications. Speaking at the critque, General Sanders stressed the importance of using electronic devices, such as mobile homers, to guide troop-carrier aircraft to the DZ under all weather conditions and at night. And the Troop Carrier Air Division (Prov) commander, commenting on the use of pathfinder teams for marking DZ's, stated that they could not effectively carry out this task and that the use of mobile homers and airborne radars was essential if troop-carrier units were to have an all-weather and night capability. He recommended that all troop-carrier units be given the opportunity to work with the JOC and TACC in connection with aerial delivery in instrument weather, using AN/MSQ-1 radar and/or other methods of electronic navigation.[56]

The principal Army communication deficiency affecting air-ground operations was the lack of proper radio equipment for the air-request net. The 11th Airborne Division commander observed that in order to make air-ground operations fully effective, satisfactory air-request communication would have to be provided.[57]

Atomic Weapons Operations

An especially noteworthy aspect of Exercise SNOW FALL was the tactical employment of atomic weapons. In Exercise SOUTHERN PINE atomic play was not an integral part of the maneuver but was injected into the planning at a late date and was carried out in the form of a command post exercise superimposed on the actual exercise and conducted by a special staff section of maneuver director headquarters.* Atomic play was comparably more realistic in SNOW FALL, which was the first large two-sided troop maneuver actually to employ simulated atomic weapons. The use of these weapons was contemplated from the beginning, and plans were drawn accordingly. No special staff section was appointed; atomic weapons operations were planned by the special projects division of the manuever headquarters J-3 section, and were carried out as a normal function of existing Air Force, Army, and joint commanders and staffs.

From the experience of Exercise SNOW FALL a number of conclusions relative to the tactical use of atomic weapons were drawn. The exercise demonstrated the importance of accurate and timely intelligence for the selection of targets. The development of improved methods for rapid collection and processing of intelligence was deemed imperative. Staffs of units given the capability of employing atomic weapons needed a specialist to furnish technical advice on the selection of atomic targets.[58]

To improve atomic play in subsequent training exercises, the J-3 section recommended that a uniform system for umpire assessing and reporting of casualties be adopted. Damage criteria for troops and equipment needed to be revised to include criteria applicable to atomic weapon operations carried out under conditions of extreme cold and snow. There was a requirement also for the development of a suitable device for simulating atomic explosions, one that would be realistic, relatively safe, simple to employ, inexpensive, spectacular, and suitable for all-weather delivery.[59]

The main defensive tactic employed by the 11th Airborne Division against a tactical atomic weapon was dispersion, a measure that was considered adequate since it would restrict serious damage to a battalion area. The division had an excellent standing operating procedure for use in case of an atomic bomb attack, and it was promptly and effectively carried out when the Aggressor weapon was exploded.

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*See above, pp. 11 and 25.

The offensive use of an atomic weapon presented no new or unexpected problems for the division. However, it was learned that careful coordination was required in the use of a restraining line and that in exploiting the use of the weapon, the distance of troops from ground zero could be reduced by maintaining effective control and circulating timely warning to all units.[60]

CHAPTER V

EXERCISE LONG HORN—PLANS AND OPERATIONS

Exercise Objectives

Exercise SNOW FALL was followed almost immediately by Exercise LONG HORN, a joint Army-Air Force maneuver held from 25 March through 10 April 1952 in the Fort Hood, Texas, area. According to the directive for the exercise, the purpose of LONG HORN was:

1) To train Army and Air Force units in planning and conducting large-scale offensive and defensive operations, night operations, defense on a wide front, and tactical employment of and defense against chemical and atomic weapons.

2) To train Army and Air Force units in tactical air operations, airborne operations, armor breakthrough operations and exploitation, and logistical support, including aerial supply and rail, motor, and air movement.

3) To develop and test Army-Air Force joint tactics, techniques, and equipment.[1]

Planning

Joint planning for Exercise LONG HORN began on 13 September 1951 at a conference held at Fourth Army headquarters, Fort Sam Houston, Texas, attended by representatives of the major organizations concerned with the maneuver—Army Field Forces (AFF), Tactical Air Command (TAC), Fourth Army, and Ninth and Eighteenth Air Forces. At this meeting the Fourth Army representatives presented the Army concept of the exercise and a comprehensive plan for the ground phases of the maneuver. To the Air Force representatives it appeared that the Army had conceived LONG HORN as largely an Army exercise and had cast the Air Force in a secondary or supporting role. The Air Force representatives then stated the general training objectives which the Air Force hoped to accomplish. Requirements of the fighter-bomber units were outlined by spokesmen for TAC and Ninth Air Force, and troop-carrier requirements were set forth by officers from Eighteenth Air Force. After listening to the Air Force spokesmen, Fourth Army representative promised to revise the Army plan, taking into account the training needs of the Air Force.[2]

The 13 September conference was followed on 1 October by a meeting, also at Fourth Army headquarters, between representatives of AFF, TAC, Ninth and Eighteenth Air Forces, XV Corps, and the 82d Airborne Division. Ninth Air Force, which was chiefly responsible for Air Force planning, outlined the Air Force maneuver concept, and the conferees then worked it into the Army concept. Also considered at this conference were such matters as the airdrops scheduled for the pre-exercise training phase and for the exercise proper, the airlift of the 31st Infantry Division to the maneuver area, and budgetary matters.[3]

A third joint planning conference was held at Fourth Army headquarters on 6 December with representatives of AFF, TAC, Ninth and Eighteenth Air Forces, XV Corps, 31st Infantry Division, and the maneuver director in attendance. The purpose of the meeting was to discuss overall maneuver planning, with particular emphasis on the mission of the 31st Infantry Division. The Army was especially desirous that Eighteenth Air Force furnish sufficient aircraft to airlift the entire 31st Division to the maneuver area. To the Army this seemed more important than the conduct of troop-carrier operations during the exercise itself. Eighteenth Air Force, on the other hand, stressed the importance of providing troop-carrier units with training in aerial resupply and in troop and equipment drops. The matter was settled by compromise; the Air Force agreed to increase the airlift tonnage for

the 31st Division, and the Army agreed to a tentative schedule of airdrops for the exercise. Representatives from Ninth and Eighteenth Air Forces were to conduct a survey of airfields in the maneuver area and to recommend those which should be used.[4]

Joint planning was also carried out by maneuver director headquarters. Activated on 1 November and staffed by officers from both services, this headquarters on 15 December published the general plan for the exercise. Until the beginning of the exercise its staff handled the day-by-day joint planning at maneuver director level.[5]

Since Eighteenth Air Force units were to operate largely as a part of the Aggressor force, the Ninth Air Force became responsible for overall Air Force planning and for direct supervision of Air Force participation in the maneuver. It was also responsible for the allocation of maneuver funds to Air Force units and for the logistical support of these units.[6]

Ninth's planning activities began upon receipt of instructions from TAC in August 1951. Representatives of Ninth and Eighteenth Air Forces and Air Materiel Command met at Headquarters TAC on 24 September and selected the Air Force units required for the exercise. On 24 October Ninth Air Force submitted to TAC its comments and recommendations on the maneuver concept and scenario, Air Force troop list, personnel requirements, and logistical support.

Preparation of the Ninth Air Force plan for the maneuver began after the publication of the general plan on 15 December. The general plan, however, was incomplete, and the Ninth Air Force operation plan for LONG HORN, which was published on 12 February 1953, was minus certain portions because of this lack of information. The plan was gradually completed as full information became available.[7]

In the meantime Eighteenth Air Force prepared for its part in the exercise. Early in February the Eighteenth established a temporary headquarters at Lawson AFB, Fort Benning, Georgia, and selected staff members for Headquarters, Eighteenth Air Force (Advance), which was to be the troop-carrier headquarters for the exercise. Planning by this headquarters began after the return of Eighteenth Air Force representatives from a conference held on 15 February at Fort Sam Houston for the purpose of making a final selection of troop-carrier bases for the exercise. Eighteenth Air Force (Adv) Operations Order 1-52 was completed on 23 February.[8]

Organization and Command Structure

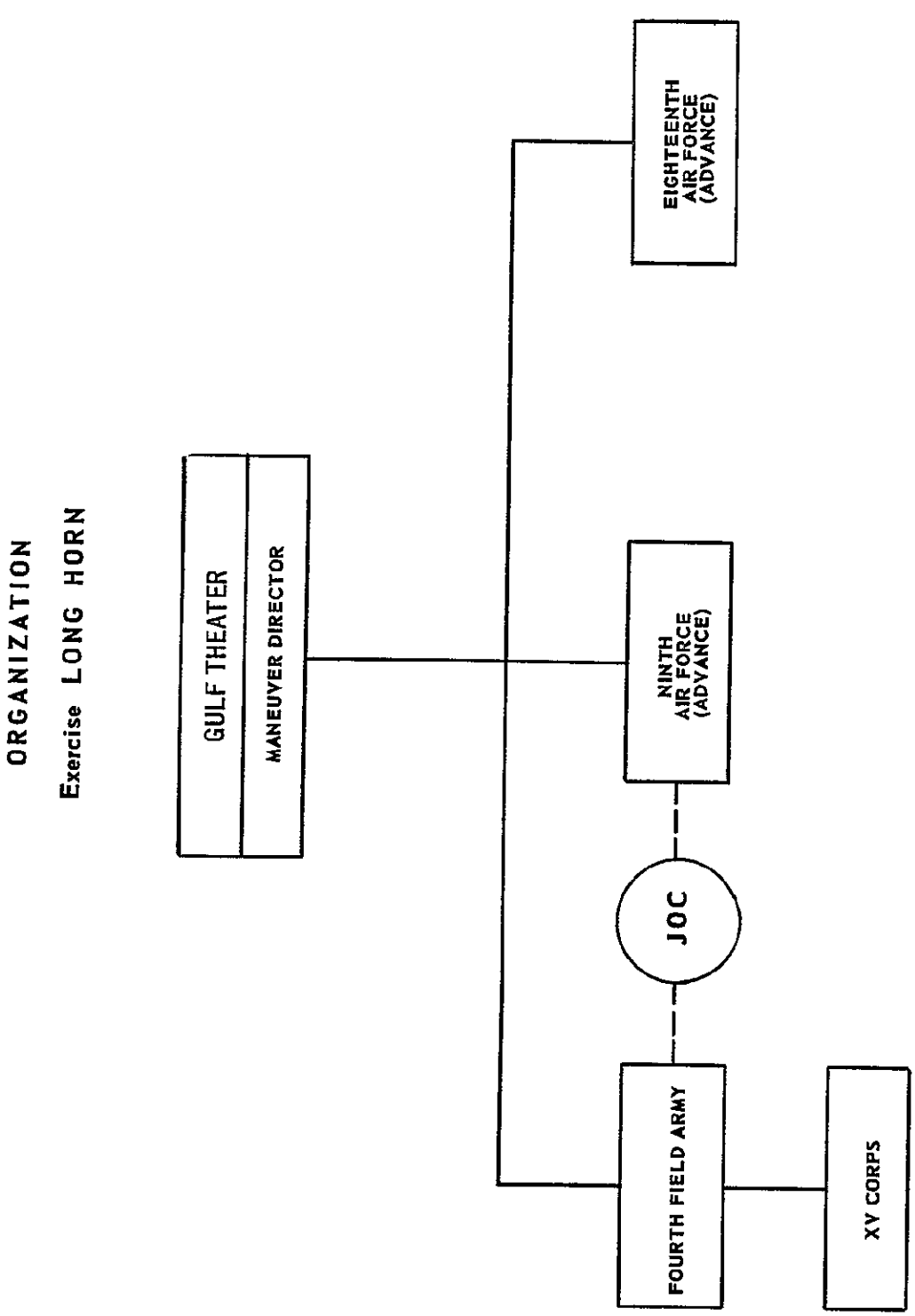
Organizationally, Exercise LONG HORN was set up as a theater operation (Gulf Theater), with Fourth Field Army, Ninth Air Force (Adv), and Eighteenth Air Force (Adv) as its major components.* Maneuver director for LONG HORN and also Gulf Theater commander was Lt. Gen. W.M. Hoge, Commanding General, Fourth Army. Serving respectively as deputy maneuver director (Air) and deputy maneuver director (Army) were Maj. Gen. E.J. Timberlake, Commanding General, Ninth Air Force and Maj. Gen. H.R. Gay, deputy commander of Fourth Army. General Gay also served as Fourth Field Army commander. Brig. Gen. James Ferguson, deputy commander of Ninth Air Force, headed Ninth Air Force (Adv) and Brig. Gen. L.V.M. Murrow, Commanding General, 434th Troop Carrier Wing, commanded Eighteenth Air Force (Adv). The Aggressor Air Force was led by Brig. Gen. Joe C. Moffitt, commander of the 140th Fighter-Bomber Wing.[9]

Participating Units

Air Force units assigned to Ninth Air Force (Adv) included the 131st, 137th, and 146th Fighter-Bomber Wings, the 118th Tactical Reconnaissance Wing, the 507th Tactical Control Group, the 933d Signal Battalion, the Forward Air Control Squadron (Prov), and the 3d Weather Squadron. The principal units operating under Eighteenth Air Force (Adv) were the 375th and 516th Troop Carrier Wings (M), the 16th Troop Carrier Squadron, Assault (L), the 1st Aeromedical Group, and the 1st Aerial Port Operations Squadron. Six additional troop-carrier wings—the 62d, 314th, 434th, 435th, 443d, and 514th—

*See Chart 3.

CHART 3



were attached to Eighteenth Air Force (Adv) for the airlift of the 31st Division to and from the maneuver area. During the exercise itself, Eighteenth Air Force (Adv) furnished troop-carrier support to both U.S. and Aggressor forces.[10]

U.S. forces ground units included the 31st and 47th Infantry Divisions, the 1st Armored Division, and the 508th Airborne Regimental Combat Team (RCT). The three divisions were assigned to Fourth Field Army's XV Corps; the airborne regiment was retained under theater control.[11]

Composing the Aggressor army force was the 82d Airborne Division, with the 17th Armored Cavalry Group attached. Logistical support for both Aggressor and U.S. ground forces was provided by the Army's 301st Logistical Command. The major Aggressor air units were the 108th Fighter-Bomber Wing, the 363d Tactical Reconnaissance Wing, and the 157th Aircraft Control and Warning Group. Their logistical support was provided by the 157th Group.[12]

Exercise Bases

Headquarters, Ninth Air Force (Adv), was located at North Fort Hood. The 131st and 146th Fighter-Bomber Wings were based at Waco Municipal Airport, Waco, Texas, and the 118th Tactical Reconnaissance Wing was stationed at Draughton-Miller Municipal Airport, Temple, Texas. The 137th Fighter-Bomber Wing operated from its home station, Alexandria AFB, Louisiana.[13] The maneuver location of Headquarters, Eighteenth Air Force (Adv), was San Angelo Municipal Airport (Mathis Field), San Angelo, Texas. Also based there was the 516th Troop Carrier Wing. Located at Brownwood Municipal Airport, Brownwood, Texas, were the 375th Troop Carrier Wing and the 16th Troop Carrier Squadron, Assault (L). The Aggressor air force headquarters site was approximately six miles west of Lometa, Texas. The Aggressor air force's 108th Fighter-Bomber Wing and the 363d Tactical Reconnaissance Wing were based at San Angelo.*[14]

The maneuver headquarters of Eighteenth Air Force (Adv), as well as that of the Aggressor air force, opened during the last week of February, and Headquarters, Ninth Air Force (Adv), opened on 15 March. Air units moved to their maneuver bases during the first two weeks of March. Unit aircraft were flown to their bases, and equipment and personnel were transported by Eighteenth Air Force troop-carrier aircraft, by unit aircraft, and by motor convoy.[15]

The outstanding feature of the Army's move to the exercise area was the airlift of the 31st Infantry Division. During the period 19-24 March eight troop-carrier wings, employing C-46, C-82, C-119, and C-124-type aircraft that were dispatched in formation, carried a total of 8,941 troops and 515.3 tons of equipment from Shaw AFB, South Carolina, to Draughton-Miller Municipal Airport, Temple, Texas.†[16] Other Army units moved into the maneuver area by motor convoy and rail during February and the early part of March. Headquarters, Fourth Field Army, opened on 3 March near North Fort Hood.[17]

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*Air Force units during LONG HORN were equipped with the following numbers and types of aircraft:

Ninth Air Force (Adv)	
131st Fighter-Bomber Wing	62 F-51's
137th Fighter-Bomber Wing	Two flights of four F-84's each day
146th Fighter-Bomber Wing	52 F-51's
118th Tactical Reconnaissance Wing	18 RF-80's, 18 RF-51's, 10 RB-26's and B-26's
Eighteenth Air Force (Adv)	
375th Troop Carrier Wing	27 C-82's, 15 C-119's (from attached 77th Troop Carrier Squadron)
516th Troop Carrier Wing	Approximately 100 C-46's
16th Troop Carrier Squadron, Assault (L)	5 C-122's, 3 H-5's, 3 H-19's
Aggressor Air Force	
108th Fighter-Bomber Wing	72 F-47's
363d Tactical Reconnaissance Wing	6 RF-80's, 3 RB-26's

†After the exercise, troop-carrier aircraft airlifted a total of 8,708 31st Division personnel and 515.02 tons of equipment from San Angelo Municipal Airport to Camp Atterbury, Indiana.

Pre-Exercise Training

After their arrival in the maneuver area and before the beginning of the exercise on 25 March, air units were occupied with pre-maneuver training. Ninth Air Force (Adv) fighter-bomber and reconnaissance units flew familiarization flights over the maneuver area and engaged in such ground activity as the use of photos and grid maps, the use of special maneuver maps, and the study of search and rescue methods. From 18 through 20 March, Ninth Air Force (Adv) held a command post exercise, called CPX SHORT HORN, which was designed to familiarize everyone with the positions that they were to occupy during the maneuver, to test communication facilities, and to provide training for Air Force and Army units and individuals. Air Force units flew canned missions in the maneuver area, missions that afforded the pilots target orientation, practice in the use of grid maps, and experience in working with the tactical air control system.[18]

Eighteenth Air Force (Adv) in the period 29 February-24 March completed final plans for the airborne operations to be conducted in conjunction with the 82d Airborne Division. Special attention was paid to final selection of DZ's and to joint planning with the 82d Airborne Division. Troop-carrier units concentrated on formation flying. Because the 516th Wing, which was to make most of the personnel drops, had been committed during the previous two months largely to single-plane airlifts, it had to practice formation flying after it arrived at its maneuver base.[19]

The main event of the troop-carrier training period was the practice drop of the 82d Airborne Division's 325th RCT. As a rehearsal for the 325th's M-day (25 March) drop, 78 C-46's of the 516th Troop Carrier Wing dropped 1,900 paratroops and 52 bundles on DZ A, located about eight miles west of Lometa.* On the same day 18 C-82's and 15 C-119's of the 375th Troop Carrier Wing dropped supplies and heavy equipment to the 325th RCT near Lometa. Other training drops were made by the 375th's C-82's on 12, 19, and 23 March.[20]

Pre-exercise training by Aggressor air force units consisted of orientation flights, instrument flying, and night flying. During the troop carrier-airborne rehearsal the 108th Fighter-Bomber Wing furnished escort for troop-carrier aircraft and flew DZ-neutralization missions. Aggressor air force also held a CPX on 10-11 March in order to establish the organization and procedures for the Aggressor JOC.[21]

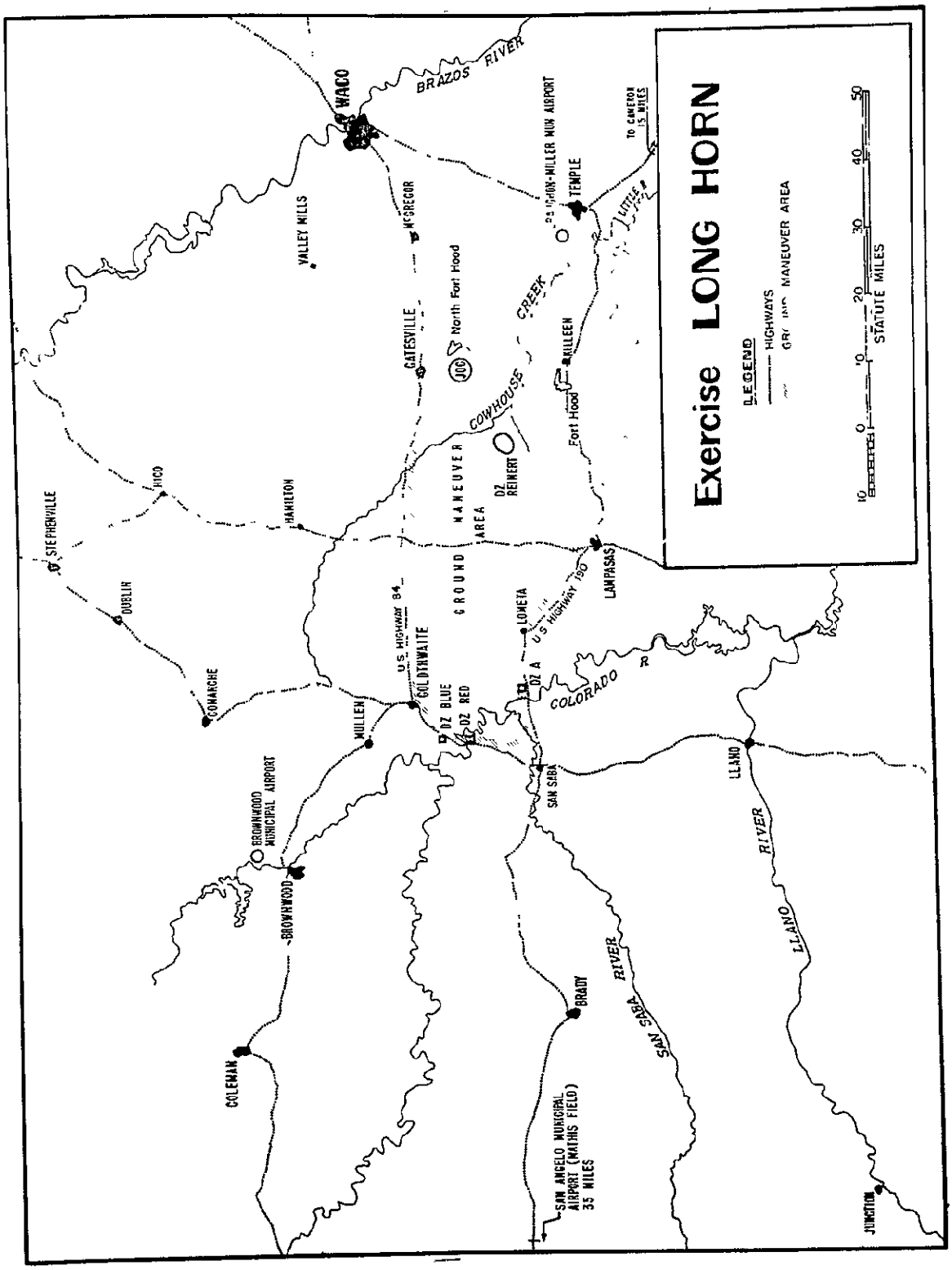
Play of the Exercise

The tactical play of Exercise LONG HORN began on 25 March. According to the scenario for the maneuver of ground and air units, an Aggressor nation in September 1951 had made amphibious and airborne landings along the coast of Texas. The Aggressor pushed inland and by 10 December had captured San Antonio. In March 1952 Aggressor forces secured the left flank of their bridgehead by taking Uvalde and advanced northward across the Llano and San Saba Rivers between Brady and Lampasas in the direction of Brownwood. To the northeast Aggressor mechanized spearheads had broken the U.S. lines along the Little and Brazos Rivers in an attempt to locate and destroy munitions dumps and capture the important communication center at Waco. On 25 March Aggressor and U.S. forces faced each other along the line Laredo-Uvalde-Brownwood-Temple-Bryan-and south along the Brazos River to the Gulf.[22]

To oppose the Aggressor advance the Gulf Theater of Operations used three field armies—the Twelfth on the right, the Fourth in the center, and the Fifth on the left. Actual operations in Exercise LONG HORN were scheduled to take place in the center of Fourth Field Army's zone of responsibility, in the sector held by XV Corps. The ground maneuver was conducted in a rectangular area encompassed by a line running generally east along U.S. Highway 84 from Goldthwaite to Gatesville, south to Killeen, west along U.S. Highway 190 to San Saba, and north to Goldthwaite.† On M-day (25 March) U.S. and Aggressor ground forces opposed each other along a line running generally northwest and southeast through the center of the maneuver area.[23]

*See Map 3.
†*Ibid.*

MAP 3



Exercise LONG HORN was conducted in three phases. During Phase I, 25-30 March, the Aggressor was on the offensive, attacking to the northeast; and the U.S. forces' XV Corps was engaged in a delaying action and withdrawal. At the beginning, XV Corps committed only its 47th Infantry Division; the 31st Infantry Division was arriving by airlift and was moving into the line; and the 1st Armored Division was being held in reserve. On M-day (25 March) the Aggressor attacked, making his main effort on the south. Aggressor airborne operations were carried out to assist the ground advance by dropping the 82d Airborne Division's 325th RCT behind the 47th Division positions.* A penetration of the southern flank of friendly XV Corps line resulted, and the 47th Division, assisted by some elements of the 1st Armored Division, was forced to fight a continuing delayed action.[24]

In the meantime, the 31st Division moved into the area and established defensive positions on the east bank of Cowhouse Creek in the northern part of the XV Corp sector. By the close of Phase I the 47th Division had withdrawn to the east bank of Cowhouse Creek and set up defensive positions to the left of the 31st Division. The 1st Armored Division covered the withdrawal of the 47th Division and then reverted to corps reserve.[25] Phase I was followed by a two-day rest period (31 March-1 April).

During the Phase II ground action, 2-5 April, U.S. forces, from their prepared positions, withstood Aggressor pressure east of Cowhouse Creek and then in limited attacks secured bridgeheads on the west bank of the creek from which positions they could mount an armored attack and breakout. By the end of the phase U.S. forces had gone over to the offensive.[26]

After a day of rest (6 April) U.S. forces opened Phase III (7-9 April) with a continuation of the offensive. The 1st Armored Division (less Combat Command B), with a motorized RCT of the 31st Division attached, broke out on the north; and Combat Command B, with a motorized RCT of the 47th Division attached, broke out on the south. The remaining elements of the 31st and 47th Divisions mopped up centers of Aggressor resistance bypassed by the armor. On 8 April troop-carrier aircraft of Eighteenth Air Force (Adv) dropped the U.S. forces' 508th RCT ahead of the advance, astride the Colorado River,† with the mission of securing crossings for the armor. Phase III and the exercise ended on the following day with the link-up of the 1st Armored Division and the 508th RCT and their subsequent drive west of the Colorado River toward the Fourth Field Army objective—San Saba.[27]

Air Force Operations—Fighter-Bomber and Reconnaissance

Throughout the maneuver Ninth Air Force (Adv) carried on an interdiction campaign and provided close support to the ground forces. During Phase I, when the Aggressor had air superiority, the Ninth conducted an extensive counterair program. During Phase II it wrested air superiority from the Aggressor and by M plus 4 began to shift its effort to a carefully planned interdiction program and to close support. In Phase III the Ninth was relieved of all offensive counterair responsibility; interdiction operations were continued, but the chief emphasis was on furnishing close support for U.S. forces.[28]

All together, Ninth Air Force (Adv) fighter-bomber units flew 1,642 sorties—662 counterair, 681 interdiction, and 299 close-support.[29] Reconnaissance sorties totaled 501. RB-26's were used singly for night visual reconnaissance of main supply routes, for actual night photo reconnaissance of small areas within the maneuver area, for simulated night photo reconnaissance of targets outside the maneuver area, and for day weather reconnaissance. In all, the RB-26's flew 102 night sorties, 72 of which were visual and 30 photo. Day weather reconnaissance required 13 sorties. RF-80's were employed singly during daylight hours mainly for deep penetration photo and visual reconnaissance and for large area photo coverage. The RF-51's were used in the daytime in pairs for low-altitude visual reconnaissance in the frontline area and for close-in, small area photo coverage. The RF-80's and RF-51's flew 261 day visual reconnaissance sorties and 125 day photo reconnaissance sorties. Aerial photos were processed by the joint air photo center (JAPC), manned by the 118th Reconnaissance Technical Squadron and the Army's 98th Engineer Photo Reproduction Company.††[30]

*For an account of airborne operations see below, p. 55.

†A Texas river.

††Midway through the exercise this Army unit was withdrawn from the JAPC and transferred overseas.

For the Aggressor the 108th Fighter-Bomber Wing flew 1,030 sorties. Visual, photo, and weather reconnaissance for the Aggressor forces were provided by the 363d Tactical Reconnaissance Wing detachment, which flew a total of 123 missions. Of these, 94 were day missions flown by RF-80's, and 29 were night missions flown by RB-26's. Visual reconnaissance received the chief emphasis, but 19 U.S. forces airfields were photographed daily.[31]

Troop-Carrier Operations

Troop-carrier activity carried out by units of Eighteenth Air Force (Adv) consisted of personnel, supply, and equipment drops; assault-landing operations; and aeromedical evacuation missions. The two main personnel drops were those made on 25 March and 8 April. On 25 March (M-day) 75 C-46's of the 516th Troop Carrier Wing, using San Angelo Municipal Airport as the departure airfield, dropped 2,171 paratroops of the 325th RCT on DZ Reinert, located about 16 miles southwest of Gatesville. On 8 April 102 C-46's of the 516th Wing, again departing from San Angelo, dropped approximately 3,150 personnel of the 508th RCT on DZ's Red and Blue. DZ Red was located just south of the Colorado River and 13½ miles directly south of Mullen, DZ Blue was situated north of the Colorado River and two miles north of DZ Red.*[32]

The task of dropping supplies and equipment to the ground forces was performed by the 375th Troop Carrier Wing. On M-day the 375th, using C-82's and C-119's, dropped supplies and equipment to the 325th RCT on DZ Reinert. Units of the 31st and 47th Divisions and the 82d Airborne Division were supplied by air on 28 March, and additional drops to the 47th Division were made on 2, 3, and 5 April. Operations by the 375th Wing were concluded on 9 April with a drop of supplies and equipment to the 508th RCT on DZ Red.[33]

Assault-landing missions were flown by C-122, H-19, and H-5 aircraft of the 16th Troop Carrier Squadron, Assault (L). Assault landing of supplies and equipment was handled chiefly by the squadron's five C-122's. These assault-type aircraft landed on 25 March (M-day) on an airlanding area (ALA) consisting of a section of road in DZ Reinert and again on 8 April on an ALA in DZ Red. The squadron's three H-19 and three H-5 helicopters were used mainly to evacuate casualties and to airlift to the ALA's the forward airfield control parties and the unloading teams of the 1st Aerial Port Operations Squadron.[34]

Aeromedical Evacuation

Aeromedical evacuation in LONG HORN was performed mainly by the Air Force's 1st Aeromedical Group and 16th Troop Carrier Squadron, Assault (L), and by the Army's 6th Transportation Helicopter Company, the latter acting as a provisional helicopter ambulance detachment. Responsibility for aeromedical evacuation was shared by the Army and the Air Force. Shortly before LONG HORN began, TAC and OCAFF agreed that in the ground action of this exercise Army aircraft would move simulated casualties from the forward areas to division clearing stations and that Air Force aircraft would be employed for rearward evacuation from the clearing stations. Actual casualties were to be evacuated to a point of definitive treatment by the most expeditious means available. During all airdrops, however, casualties were to be evacuated by the Air Force.[35]

During the exercise itself Air Force evacuation activities were limited to the movement of actual casualties. A ruling by the maneuver surgeon that simulated casualties would not be evacuated to the rear of the division clearing stations put the Air Force out of the simulated play.[36]

During ground operations H-19 helicopters of the 16th Troop Carrier Squadron, Assault (L), moved actual casualties to various medical installations in the maneuver area and from the 5th, 24th, and 388th Evacuation Hospitals in the maneuver area to an ALA at North Fort Hood. Here they were transferred to 16th Squadron C-122's for further evacuation to the Fort Hood station hospital. Patients requiring hospitalization at special treatment centers outside the Gulf Theater of Operations were

*See Map 3.

evacuated by aircraft of Eighteenth Air Force (Adv) from Gray AFB, Fort Hood, to Kelly AFB, San Antonio, Texas, the Military Air Transport Service (MATS) theater air terminal. Evacuation from Kelly to the specialized treatment centers was carried out by MATS aircraft. Patients who did not require hospitalization at specialized treatment centers but who would be hospitalized longer than the period of the maneuver were evacuated from Fort Hood to their home stations by aircraft of Eighteenth Air Force (Adv).* These were intratheater lifts since the home stations were considered to be within the Gulf Theater of Operations.[37]

During the airdrop of 25 March H-19's of the 16th Squadron evacuated paratroop casualties from DZ Reinert to the 24th Evacuation Hospital. One critically injured patient was flown directly from the DZ to the Fort Hood station hospital. The 16th Squadron's C-122's did not participate because of the lack of fire-fighting equipment at the ALA located near the 24th Evacuation Hospital.[38]

For the drop of 8 April the ground forces established a collecting station on DZ Blue and a clearing station on DZ Red, four miles north of the collecting station. H-19's evacuated casualties from the collecting station on DZ Blue to the clearing station on DZ Red. H-19's and C-122's moved the casualties from the ALA at DZ Red to the 24th Evacuation Hospital. Some casualties were transferred, chiefly by C-122, from the evacuation hospital to Fort Hood station hospital.[39] Subsequent evacuation of airdrop casualties from Fort Hood to hospital facilities outside the Gulf Theater was carried out by Eighteenth Air Force (Adv) and by MATS.

It was the job of the 1st Aeromedical Group to receive casualties at various points in the air evacuation chain and process them for further evacuation. Also a part of the group's responsibility was the in-flight care of casualties. To carry out these tasks, the group established casualty staging flights at Brownwood Municipal Airport, Fort Hood station hospital, 24th Evacuation Hospital, and North Fort Hood ALA. During all air evacuation missions in-flight treatment was provided by medical personnel organic to the evacuation flights. All Air Force aeromedical evacuation operations were centrally controlled from the 1st Aeromedical Group operations section at Brownwood. This section maintained close contact with the 16th Troop Carrier Squadron, Assault (L), also located at Brownwood. To assure coordination with the ground forces, aeromedical group liaison personnel were attached to the organic medical installations of the ground units.[40]

The Air Force evacuated a total of 1,665 patients during Exercise LONG HORN. This figure represented 95 percent of all actual patients evacuated by air during the exercise. The other 5 percent were evacuated by Army helicopters and liaison aircraft.[41]

Aerial Port Operations

Responsibility for aerial port operations was divided between Air Force and Army organizations. Assigned to the exercise by the two services were three units designed to carry out aerial port activities, the Air Force's 1st Aerial Port Operations Squadron and the Army's 601st Quartermaster Aerial Supply Company and 349th Transportation Port Company. As in the case of aeromedical evacuation, a division of responsibility for this exercise alone was worked out by TAC and OCAFF shortly before the exercise began. Under the terms of this agreement the 1st Aerial Port Operations Squadron was responsible for supervising the loading, lashing, in-flight ejection, and unloading of supplies and equipment from the troop-carrier aircraft. The aerial port squadron was confined to this supervisory function because it lacked the equipment to perform these tasks. Most of the actual work was carried out by the 601st Quartermaster Aerial Supply Company, which had the equipment. In addition, the Army unit had the responsibility of packaging, temporarily storing, and preparing supplies for aerial delivery. The 349th Transportation Port Company was assigned the task of establishing aerial ports of embarkation and debarkation for assault-type aircraft. Under Air Force supervisors it carried out the job of loading, lashing, and unloading air-landed cargo delivered by transport aircraft.[42]

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*Evacuations from Fort Hood to home stations and to the MATS theater air terminal were performed by C-46, C-47, C-82, C-119, and C-124 aircraft.

Communications

Air Force communication facilities for Exercise LONG HORN were installed and operated principally by the 507th Tactical Control Group, the 933d Signal Battalion, and the 157th Aircraft Control and Warning Group. Tactical air control system facilities provided for Ninth Air Force (Adv) by the 507th Tactical Control Group included a TACC at North Fort Hood; two TADC's, one at Stephenville and the other at Valley Mills; and two TADP's at North Fort Hood. The Stephenville TADC was supported by L/W radar units located at Coleman and Hamilton; the Valley Mills TADC L/W radar units were located at Cameron and Temple. Each TADC was provided with a three-station VHF D/F net.[43] Landline telephone, FM radio, and teletype facilities linking Ninth Air Force (Adv) with its subordinate units were installed and operated by the 933d Signal Battalion.[44]

For the Aggressor tactical air control system the 157th Aircraft Control and Warning Group provided a TACC located about six miles west of Lometa, a TADC at Brady, and a L/W radar unit at San Saba.[45] For teletype and voice communication with its tactical units the Aggressor air force depended chiefly on commercial circuits.[46]

To provide TACP's and air liaison officers (ALO) for the exercise Ninth Air Force formed the Forward Air Control Squadron, Provisional. In effect, this squadron was a central pool of TACP's and ALO's, and its activities were supervised by the director of combat operations in the JOC. To man the squadron 17 officers and 88 airmen were drawn from the 507th Tactical Control Group and 40 officers and 88 airmen were supplied by other TAC units.[47]

A second innovation contributed to LONG HORN by Ninth Air Force was the organization of the Tactical Communication and Electronic Division, Provisional. All communication and electronic units assigned to Ninth Air Force (Adv) for the exercise were placed under the operational control of the division. The Ninth Air Force deputy for communications and electronics acted as the division commander, and his staff was drawn from the division's subordinate units and from the Ninth's communications and electronics section. The mission of the division was to coordinate the installation, maintenance, and operation of an integrated communication system and to provide centralized control of all tactical air force communication activities.[48]

Atomic Weapons Operations

The play of atomic weapons in Exercise LONG HORN was on a considerably larger scale than in Exercises SOUTHERN PINE and SNOW FALL. A total of 11 atomic weapons (simulated) was used in the exercise. Ten of these were air-delivered, and one was an artillery-fired atomic projectile. Atomic weapons were first used at 0600 on M-day (25 March) in attacks by aircraft of Ninth Air Force (Adv) on five Aggressor airfields. Each field was hit by a single aircraft carrying an atomic bomb. Airfields were selected as targets not only to reduce Aggressor air superiority but also to prevent him from launching air atomic strikes against U.S. forces. Aggressor losses were heavy, but in the next few days the Aggressor augmented his strength to such a degree that the Ninth found it necessary to strike again at his airfields. At 0630 on M plus 5 (30 March) two Aggressor airfields were hit, each by a single fighter-bomber carrying an atomic bomb.[49]

These counterair operations accounted for 7 of the 10 air-delivered atomic weapons employed in LONG HORN. The remaining three were used by the Aggressor air force in close support of Aggressor ground action. At 1715 on M plus 3 (28 March), in order to destroy a part of XV Corps' reinforcing capability, the Aggressor dropped an atomic bomb on the 31st Infantry Division, which was then in corps reserve. The second close-support strike, delivered at 0700 on M plus 9 (3 April) against the 47th Infantry Division's 136th Regiment, was aimed at reducing the U.S. forces' defensive capabilities along Cowhouse Creek. At first light on M plus 11 (5 April) the Aggressor air force made its final atomic attack on the U.S. forces. Again the target was the 31st Division. This time the weapon was used to enlarge the Aggressor bridgehead across Cowhouse Creek in the southern part of the XV Corps sector.[50]

The artillery-fired atomic projectile was employed by Fourth Field Army against the Aggressor 325th RCT, which had been dropped behind U.S. forces' lines on M-day. The projectile was fired from the Army's 280-mm. gun (simulated) at 0931, approximately 90 minutes after the airdrop. The use of the weapon combined with an exploitation attack by the 47th Division was intended to disrupt the airborne assault and prevent the link-up of the 325th RCT with Aggressor forces attacking from the west.[51]

Overall control of special weapons operations by U.S. forces was vested in the Gulf Theater commander. The authority to employ an air-delivered atomic weapon rested solely with the theater commander.* There was no delegation of this authority below theater level. The authority to employ artillery-fired atomic munitions, however, could be delegated by the theater commander to army and corps commanders.[52]

For the Aggressor the procedure for controlling the atomic play was somewhat different. Requests for the use of atomic weapons were submitted by Aggressor headquarters to the J-3 section of maneuver director headquarters, where they were first examined by this section's atomic advisory group, then passed to the J-3 section itself for review, and finally submitted to the maneuver director for approval.[53]

Ninth Air Force (Adv) atomic weapons operations were planned and directed by its regular staff sections. Members of the operations and intelligence staffs of Ninth Air Force headquarters had received formal training in special weapons and were considered capable of integrating atomic operations into the existing tactical air operations system. However, a change was made in the arrangement of the JOC. Since the JOC was open to visitors and observers, it was necessary for security reasons to establish a separate planning room in a Jamesway shelter located adjacent to the JOC. This room was used by JOC personnel when they were handling special weapons activities.[54]

Atomic operations by Ninth Air Force (Adv) were marked by a great deal of simulation. All atomic action below Ninth Air Force (Adv) headquarters level was simulated with the exception of reconnaissance activity. In order to provide data for training personnel in photo interpretation, target selection, weapon selection, and damage estimation, photo reconnaissance missions were actually flown over Aggressor airfields before and after the atomic attacks.[55]

The three atomic close-support strikes against the U.S. forces were actually flown by Aggressor aircraft carrying simulated atomic loads.[56] The explosion of these weapons and the artillery-fired atomic projectile employed by the U.S. forces was simulated by a device described by one observer as an "ad hoc atomic mortar," consisting of a large section of cast-iron pipe about eight inches in diameter mounted on a ¼-ton weapons carrier. The pipe served as a projector for a commercial-type pyrotechnic that was shot into the air and exploded at a height of about 400 feet, thus simulating the atomic burst.[57]

*Actually, it will be recalled, the maneuver director, General Hoge, acted also as the Gulf Theater commander. As theater commander he controlled U.S. forces atomic weapons operations, and as maneuver director he controlled atomic weapons activity by the Aggressor.

CHAPTER VI

EXERCISE LONG HORN—FINDINGS

Exercise LONG HORN, one of the largest of the post-World War II joint maneuvers, furnished an insight into a wide variety of Air Force problems—problems in the field of planning and in virtually the entire range of tactical air operations, including the tactical employment of nuclear weapons.

Planning

Following the exercise, General Hoge, the maneuver director, expressing satisfaction with the planning carried out by the joint maneuver staff, called it a "successful and workable organization."[1] Ninth Air Force reports, however, were critical of certain aspects of joint maneuver planning. The principal complaint was that much of the early planning was not truly joint. Ninth Air Force first learned of its planning responsibilities late in August 1951. The Ninth's counterpart, Fourth Army, on the other hand, had received its planning directive from Army Field Forces on 1 May and had immediately formed a special team to begin active planning. By the time the first joint planning conference was held—13 September—Fourth Army was able to present a detailed concept and plan for the exercise, which, of course, had been worked out unilaterally. This situation made it difficult for the Air Force to insure full recognition and inclusion of the Air Force interpretation of approved joint doctrine.[2]

The establishment of the joint maneuver staff on 1 November bettered the Air Force position but little. Although Army personnel manning the Army positions on the J-staff arrived shortly after 1 November, it was not until the middle of January 1952 that the Air Force positions were adequately manned. By this time the joint staff planning, dominated by Army officers who had been present almost from the beginning, was well advanced and naturally reflected Army doctrinal views.[3]

To Ninth Air Force it seemed that the concept developed by the Army created the impression that the ground force objectives and the theater objectives were synonymous.[4] This concept failed to take into account the Air Force view that the theater objectives were normally broader than the ground force objectives and that they involved more than just the waging of a surface campaign. If the carrying out of a successful surface campaign was made the sole or principal theater objective, it followed logically that theater air forces would be used normally for the support of surface forces. The commitment of theater air forces solely or primarily in this mission, the Air Force believed, placed undue restrictions on the flexibility and versatility of airpower and limited its ability, in its own right, to play a decisive role in the destruction of enemy forces.

In all probability the Air Force could have secured a maneuver concept more to its liking if planning had been carried on jointly from the inception of the exercise and if Air Force positions on the joint staff had been filled promptly by experienced people. The tardy arrival of Air Force staff officers was partly explained by the fact that some of them had been engaged in Exercise SNOW FALL and could not report until that exercise had been completed. So far as experience is concerned, there was evidence that although Air Force staff officers were individually competent, many had had no maneuver experience or even high-level staff experience before taking high-level positions at maneuver director headquarters. The Army, on the other hand, sent trained personnel, who arrived early in the planning phase.[5] Under these circumstances Air Force views were not adequately reflected in the maneuver concept and organization.

Ninth Air Force suggested that the best way to insure early and continuous joint planning was to create a joint planning group at TAC-OCAFF level and make it responsible for planning all joint

field exercises. This group would begin work as soon as TAC or OCAFF established a requirement for a joint exercise. It would publish the general plan, outlining the tasks of subordinate commands and clarifying or deleting matters of interservice controversy. After issuing the general plan, the joint planning group in the case of major exercises would move into the field and become the maneuver director's staff.[6]

Air Force planning, as distinguished from joint planning, was efficiently conducted, particularly the operational planning by Ninth Air Force.[7] However, pre-exercise planning by the Ninth was complicated because it was required to furnish logistic support for all Air Force units participating in the exercise and had to formulate not only its own logistic plans but also those of Eighteenth Air Force. The Ninth recommended that in future exercises each numbered air force be required to furnish logistic support for its own units and handle its own logistic planning.[8]

Air Force planning was delayed by the failure of the USAF Comptroller to authorize maneuver funds until late in the planning phase.[9] There was a delay also in the issuance of the Ninth Air Force operations plan for the exercise. The 146th Fighter-Bomber Wing noted that its planning was handicapped by the lack of a Ninth Air Force operations plan, which did not arrive until the wing's advance echelon had left for the maneuver area. The wing felt that its planning would have gone more smoothly if the Ninth had published at least a preliminary plan as soon as possible after its commitment to the exercise.[10]

The biggest stumbling block to effective operational planning by Eighteenth Air Force (Adv) was that the Eighteenth acted as a part of both friendly and enemy air. Both U.S. and Aggressor forces withheld information from the Eighteenth until the last moment, hoping to insure the security of their plans. There was an understandable fear that the Eighteenth, which was playing on both sides of the game, would be strongly tempted to let its right hand know what its left hand was doing. The Eighteenth believed that for this reason it was not given plans for fighter support and reconnaissance prior to the beginning of troop-carrier missions and that information of the exact plans drawn up at the JOC was withheld.[11]

Organization and Command Structure

The organization and command structure for LONG HORN, as they were finally worked out on paper, appeared to be sound. But in actual practice Ninth Air Force detected certain flaws. The principal complaint was that Fourth Field Army, the opposite number of Ninth Air Force (Adv), was not a fully manned headquarters, completely separate from the Army portion of the joint theater staff. The original general plan for the exercise made no provision for establishing a field army headquarters. On 20 February 1952 the plan was amended to provide such a headquarters, but it was to be organized on an austerity basis and was designed primarily to perform nominal G-2 and G-3 functions.[12]

Actually, however, planning functions for Fourth Field Army were performed by Army members of the joint theater staff. The deputy maneuver director (Army) was also deputy theater commander (Army) and Fourth Field Army commander. The J-1, J-4, and special staff sections of the joint maneuver or theater staff functioned also as part of the Fourth Field Army staff. This arrangement, in a sense, put Fourth Field Army on a higher level in the chain of command than its opposite number, Ninth Air Force (Adv), whose staff performed solely at the tactical air force-field army level. Since neither the commander nor the staff of Ninth Air Force (Adv) functioned also at theater level, the Ninth was placed in a subordinate position. Fourth Field Army, on the other hand, with its commander and some of its staff wearing two hats, could conceivably influence decisions at theater level. Thus, the principle of coequality of theater ground and air forces was compromised, a circumstance that could have been avoided by completely divorcing the theater Army staff from the Army's operational or field army headquarters.[13]

Although Ninth Air Force (Adv) worked with a field army headquarters that was to some extent its superior, it found itself supporting not so much the field army but one of its subordinate units, XV Corps. Fourth Field Army consisted of XV, XX, and XXX Corps, but the latter two were paper organizations. The paper corps were virtually ignored by Fourth Field Army; no close-support strikes were

requested for them, and only a few reconnaissance missions. In reality, Ninth Air Force (Adv) worked with a single corps (XV Corps) rather than with a field army composed of three corps.[14] There was a danger here, from the Air Force standpoint, of creating the impression that a tactical air force normally operates in support of a corps. No such misapprehension could have been fostered if Fourth Field Army had made more of an effort to bring the simulated corps into the active planning and had requested for them a reasonable number of reconnaissance and close-support missions.

Air Force Operations--Reconnaissance

Air Force operations during Exercise LONG HORN uncovered a wide variety of problems and deficiencies, particularly of tactical reconnaissance and in the rapid dissemination of air reconnaissance information. Other deficiencies were the Army's apparent lack of understanding of the capabilities and limitations of tactical air reconnaissance, the unsatisfactory operation of the joint air photo center, and the shortcomings of reconnaissance aircraft and equipment.

Soon after Exercise LONG HORN began, it was apparent that the lapse of time between the request and the delivery of aerial photos was excessive. Only in isolated instances was the air reconnaissance system capable of producing high-priority spot photo intelligence quickly. On M-day, for example, when photo assessment of the atomic strike on the Aggressor airhead was needed, just three and one-half hours elapsed between the time of request and the time of delivery to the JOC of a spot report taken from a wet negative. During the first phase of the exercise, however, the average total time between the request for photo coverage and the delivery of the photos was 38 hours and 27 minutes. This period of delay was reduced during the second and third phases but not enough to provide timely photo intelligence.[15]

A number of factors contributed to this excessive delay. The Army photo reproduction unit lacked sufficient training, and the 118th Tactical Reconnaissance Wing, which had been organized only a short time before LONG HORN, was not fully trained and equipped. Higher headquarters failed to establish adequate priorities for photo requests, and the Air Force failed to set up one handling procedure for spot requests and a different procedure for requests for area or large route coverage.[16] Other causes of delay included the failure to process photos on a 24-hour basis and the Army's inadequate screening of its reconnaissance requests. Many of the Army requests were for photo coverage that the Army could have obtained from photos that had already been taken. Also bearing on the problem of delay was the lack of an accepted, detailed joint operational guide that would have helped the JOC to establish procedures for fast and efficient processing of air reconnaissance requests and dissemination of the resulting intelligence.[17]

Air Force observers at the exercise commented on the excessive delays in the Army's delivery of aerial photos. The Air University observers at the maneuver believed that the Army delivery system could be improved by 1) giving operational control of the Army photo delivery facilities to the Army G-2 air officer and by letting the assistant G-2 air officer at the joint air photo center exercise direct control for him; 2) delivering urgently requested photos direct to the requesting division, delivering them afterward to corps and JOC; and 3) marking "urgent" all requests that fall behind, or are very close to falling behind, delivery time.[18]

Recognizing the need for speeding up the whole reconnaissance process, the maneuver director, General Hoge, recommended in his final report that TAC and OCAFF undertake a joint project aimed at indoctrinating all concerned in the use of the various types of air reconnaissance and in the capabilities and limitations of the photographic portion of the reconnaissance effort. The project would include a study of the reconnaissance experience and data obtained from LONG HORN, particularly data on the time required to handle reconnaissance requests, photo reproduction, printing, and delivery, for the purpose of eliminating administrative delays and technical limitations.[19]

Another reason advanced for the poor reconnaissance effort in LONG HORN was that many ground staff officers did not understand the capabilities and limitations of tactical air reconnaissance. Frequently, according to General Hoge, requests were made for photo reconnaissance when the desired information could have been obtained faster and more easily by visual reconnaissance.[20] The result

was an excessive number of requests for photo reconnaissance that overloaded the whole system—request communication channels, the reconnaissance section of the JOC, the joint air photo center, and the distribution facilities.[21] Also contributing to the unnecessary requests for photo reconnaissance was the failure of divisions and corps to monitor and take advantage of the spot reports broadcast by reconnaissance pilots over the spot-report net. This information would have made many requests unnecessary. Sometimes the Army units submitted duplicate requests during the early stages of the exercise, because Army representatives in the JOC neglected to consolidate their requests.[22]

The ineffectiveness of the joint air photo center (JAPC) hampered aerial reconnaissance operations. The 118th Reconnaissance Technical Squadron, which formed the Air Force portion of the JAPC, was hastily organized just before the exercise. Much of its equipment was wornout and obsolete, and it lacked sufficient trained personnel for efficient 24-hour operation.[23] The Army also contributed to the failure of the JAPC to function properly. According to the Joint Training Directive the photo portion of the JAPC was composed of an engineer photo reproduction and distribution unit and Army interpreter teams. Originally, it had been planned to have the photo interpreter teams organic to the corps and division headquarters assigned to the JAPC during the maneuver. At the last moment the plan was changed; the teams remained with their respective units, and a serious bottleneck was created in the photo interpretation work of the JAPC.[24] At least as serious was the Army's withdrawal, early in the second phase of the exercise, of the 98th Engineer Aerial Photo Reproduction Company from the JAPC, leaving the 118th Reconnaissance Technical Squadron with the total photo reproduction responsibility.[25]

Ninth Air Force sharply reproved the Army for taking this action, pointing out that the Army, paradoxically, criticized the reconnaissance system freely while at the same time it withheld and withdrew from the JAPC Army units that were vital to its effective operation.[26] In fairness to the Army it should be said that the 98th Engineer Aerial Photo Reproduction Company was withdrawn because it was scheduled for movement to Korea. Moreover, the 118th Reconnaissance Wing reported that the loss of Army representation in the JAPC was not overly serious and that the end result of the Army unit's departure was an increase in the volume of photo reproduction, which was readily absorbed by the reconnaissance technical squadron.[27] Nevertheless, the Army did fail to meet its responsibilities so far as the furnishing of photo interpreter teams was concerned. Although the withdrawal of the photo reproduction company was evidently necessitated by the demands of the Korean War, the action had unfortunate effects since it led to misunderstanding and friction and prevented any real test of the photo center as a joint facility.

Summing up its view of the matter, Ninth Air Force concluded that a re-evaluation of the entire photographic process was needed to determine whether the JAPC concept was sound or whether the Air Force should assume the entire responsibility for all photographic processing, reproduction, and delivery. The Ninth felt that if the joint system was to be retained, a JAPC should be established on a permanent basis to carry out a further development of procedures and the training of personnel.[28]

If some of the reconnaissance deficiencies in LONG HORN lay with the Army, there were others that were entirely Air Force in origin. Especially noticeable were difficulties in night photo reconnaissance, such as shortages of aerial cameras and accessories and the unfamiliarity of maintenance personnel with RB-26 photo equipment, particularly the A-3 photoflash cartridge ejection system and associated equipment. The men who operated and maintained the A-3 system were inadequately trained reservists, recalled to active duty shortly before the exercise. The A-3 photoflash system had been approved for use the day before the exercise began, and there had been no opportunity to work with it during the pre-exercise training phase.[29]

To the 118th Tactical Reconnaissance Wing many of the problems encountered in the exercise stemmed from the failure of tactical reconnaissance during the postwar years to keep abreast of the progress of the Air Force in other fields. Tactical reconnaissance, the wing pointed out, had lagged behind in both aircraft and equipment. Three new aircraft types were needed: 1) a very fast high-altitude aircraft with a 1,000-mile radius for daylight photo reconnaissance; 2) a multi-engine aircraft of relatively high speed with a 1,000-mile radius and with the ability to carry either weather reconnais-

sance equipment or, by substitution, electronic or night photo equipment; and 3) a small powerful aircraft possessing tremendous acceleration, deceleration, and maneuverability for visual reconnaissance in the immediate vicinity of the frontlines, and capable of remaining over the target for at least two hours.[30]

Reconnaissance equipment, the wing stated, was essentially the same as that used in World War II and could not meet present combat requirements. Both the 118th Wing and Ninth Air Force emphasized the need for miniaturing cameras and laboratory equipment. The Ninth noted that there was a trend toward larger cameras and film although the space for mounting cameras in modern aircraft was very limited. Miniaturing was believed to be a logical approach. Smaller cameras and the use of five-inch film, already possible because of improvements in film and paper and developments in the field of optics, would be more compatible with newer aircraft types and would result in great savings of water, chemicals, power, space, and other items hard to procure in the field. For example, the use of five-inch film would reduce the amount of water and power required by approximately 75 percent.[31]

A broader but related problem was the need of the tactical reconnaissance wing for greater mobility. Miniaturing cameras and film would be a step in this direction. Ninth Air Force suggested that to increase mobility the squadron photo labs be permanently installed in 10-ton vans, or similar vehicles, equipped with power- and temperature-regulating facilities and plumbing designed for quick connection. Recommended also was a change in the T/O&E of the reconnaissance technical squadron. This squadron was alloted certain equipment used mainly to support a tactical air command. By limiting its equipment to that needed to support a tactical air force, mobility would be considerably increased. Elimination of the lithographic reproduction facility, for example, would reduce the weight of the squadron's equipment by 50,000 pounds. If the squadron were to support a tactical air command a special authorization of such equipment could be made.[32]

A more favorable view of aerial reconnaissance in LONG HORN was presented by the night photo detachment of the 363d Tactical Reconnaissance Wing, which was a part of the Aggressor air force. This detachment reported that despite difficulty early in the exercise with the A-3 cartridge ejector system, successful night photography was accomplished. The crews that took part in LONG HORN were judged to be fully combat ready as a result of the training gained during the maneuver. Night visual reconnaissance was considered to be very effective. The detachment had been able to gather valuable information concerning enemy activity during the twilight periods, after sundown and before sunrise. Even better results could have been obtained from night visual reconnaissance if flying safety regulations had not prohibited aircraft from flying below 1,500 feet above the highest terrain in the area. The detachment found that this restriction severely hampered night visual reconnaissance and recommended that a limit of 500 feet be set for future exercises.[33]

Also successful was the use of 363d Wing RF-80's as tactical air coordinators. However, the high fuel consumption of the RF-80's at low altitude limited their ability to perform this function. Normally, on a given mission, there was sufficient fuel to locate only one target and control the fighter-bomber strike against it.[34]

Fighter-Bomber Operations

Training in fighter-bomber operations provided by LONG HORN was considered to be especially beneficial. The 131st Fighter-Bomber Wing called this training "the best obtained to date,"[35] and the 146th Fighter-Bomber Wing was well pleased with the training afforded in close support, interdiction, and formation tactics.[36]

A significant innovation in connection with fighter-bomber operations was the use of the in-flight refueling technique. Two in-flight refueling missions were carried out by F-84's of the 137th Fighter-Bomber Wing and KB-29 tanker aircraft from the 2d Air Refueling Squadron, a Strategic Air Command (SAC) unit stationed at Hunter AFB, Georgia. On the first mission eight F-84's made interdiction attacks against rail lines, were refueled in the air, and then flew a close-support mission. On the second mission interdiction targets were hit both before and after the refueling. These highly successful missions offered a striking example of the increased flexibility of fighter-bomber operations

made possible by the in-flight refueling technique. Aerial refueling by solving the problem of high fuel consumption by jet aircraft increased greatly the time jet fighter-bombers could remain over the combat area for close-support work, and extended the range of the air superiority and interdiction campaigns.[37]

Only one discordant note was sounded in connection with aerial refueling operations. Ninth Air Force stressed the point that borrowing tanker aircraft from SAC would not be satisfactory for wartime fighter-bomber operations. A tactical air force, the Ninth believed, should have its own tanker units, assigned either directly to the fighter-bomber wings or to the tactical air force headquarters.[38]

Fighter-bomber operations, though on the whole quite satisfactory, were marked by a number of troublesome problems and deficiencies. The 131st Fighter-Bomber Wing found that the flying was too routine and restricted to sustain the interest of its pilots and that the lack of an impact area, where live bombs, rockets, and ammunition could be used, limited the training of ordnance and supply personnel. The wing complained too that in securing identification of potential targets over the air-ground radio net there was an excessive timelag. In many instances when pilots called important targets in to the JOC, giving coordinates and asking permission to attack, they were instructed to stand by, but their requests to attack were never answered. On one occasion flights circled an orbit point for over 30 minutes without receiving a reply, and they were finally told to return to base. The wing recommended as a solution to this difficulty that a priority system be devised to speed up the identification of targets.[39] The 146th Fighter-Bomber Wing had difficulty differentiating real and simulated targets during the exercise. Failure of the operation orders to indicate whether targets were actual or simulated caused confusion throughout the maneuver, confusion that sometimes resulted in incomplete missions.[40]

To the observers from the Air University it seemed that the tactics and techniques used by conventional fighter-bombers (F-47's and F-51's) were unrealistic. Flights of aircraft, approaching and flying over frontline targets, tended to disregard small arms fire. After attacking, aircraft pulled up too sharply and presented an easy antiaircraft target. Flight leaders did not appear to take precautions against air attacks while their flights were working on ground targets, and there was no provision for top cover during these attacks. Aircraft formations within the combat zone were generally flown too tight.[41]

The work of both fighter-bomber wings was hampered by a severe shortage of pilots. Only 55 percent of the 131st Wing's authorized pilot strength was available during the exercise, and for the 146th Wing the figure was 42 percent. These shortages were most keenly felt in the squadron operations and intelligence sections. The officers in these sections were pilots who were assigned these tasks as an additional duty. They were kept so busy with flying requirements that they were unable to perform these extra functions, and the work of the operations and intelligence sections suffered as a consequence.[42]

Aggressor fighter-bomber operations carried out by the 108th Fighter-Bomber Wing were hampered by the crowded conditions at the wing maneuver base, San Angelo Municipal Airport. Over 100 troop-carrier aircraft (C-46's) were based at San Angelo. Frequently the C-46's tied up the runways, causing considerable delay in landings and takeoffs by the fighter-bombers. The 108th Wing found that the maneuver area behind the U.S. lines was too small to permit Aggressor fighter-bombers to carry out a realistic interdiction program. Only a few logical targets could be found that were not in restricted areas. As a result of this situation and of the Army's desire that the fighter-bombers furnish a great deal of close support, only a few preplanned interdiction missions were flown.[43]

Close Support

Ninth Air Force attributed to the Army some of the difficulties encountered by the fighter-bombers, particularly in connection with close support. The Ninth was especially critical of the Army's assignment of inexperienced personnel to the air-ground operations section of the JOC. Early in the exercise it was difficult to obtain immediate battle intelligence from the JOC Army representatives, and it was noted also that they seldom informed Army units as to the action taken on their requests

for air strikes.[44] The Air University observers stated, however, that as the exercise progressed there was considerable improvement in the air-ground operations system.[45]

The Aggressor air force was critical of the ground forces for their failure to make preplanned requests for strikes on specific targets. There were extenuating circumstances for this failure; the battlefield situation was frequently fluid, and it was difficult for the ground forces to determine very far in advance just what their air support needs would be and what specific targets should be attacked. Since only a very few preplanned requests were submitted, the Aggressor air force had to resort to the use of air alert missions, which in some cases were wasteful of aircraft and ordnance.[46]

Maj. Gen. Hobart Gay, deputy maneuver director (Army) and commander of Fourth Field Army, called the ground forces to task for requesting air strikes against targets that could easily have been knocked out by artillery fire. General Gay stated that this unfortunately was "not an unusual practice."[47]

There was at least an implied criticism of Air Force close support in a statement given at the critique by the maneuver director, General Hoge, to the effect that although the TACP's were effective in getting close support to the ground forces, there were "some cumbersome procedures." General Hoge said further in this connection that "there is a project for the assignment of groups, a group or two groups, to the Corps, of fighter aircraft to give closer fighter support."[48] However, the parceling out of air units to Army corps was directly contradictory to Air Force doctrine and to approved joint doctrine, and the implied criticism was challenged by Air Force observers. They pointed out that the ground forces in LONG HORN received all the air support they could possibly use and that the daily sortie capability (600 sorties) of Ninth Air Force (Adv), which was supporting Fourth Field Army (actually XV Corps), was only slightly less than the daily sortie capability available to the entire Eighth Army during the greater part of the first year of the Korean war.[49]

As in Exercises SOUTHERN PINE and SNOW FALL, a major portion of the close-support difficulties centered around TACP deficiencies. True, a few good words were said for the work of the forward controllers. General Hoge's remarks at the critique were complimentary. The controllers who dropped with the airborne troops on M-day and M plus 13 did a good job; ten minutes after they hit the ground they were in contact with air alert fighter-bombers and were directing close-support strikes. The use of an airborne controller (tactical air coordinator) on M plus 13 was also successful.[50] Much more in evidence were the shortcomings of the control parties. The 131st Fighter-Bomber Wing found that the forward controllers did not properly direct the fighter-bombers to their targets. Controllers spoke in generalities when identifying targets and when giving the approach that attacking aircraft should take.[51]

In previous exercises criticism was directed at the TACP's because of their outmoded AN/VRC-1 radio equipment and the over-age jeeps used to carry TACP equipment and personnel. For LONG HORN the AN/VRC-1's were replaced with AN/MRC-20's, which were installed in new jeeps;* but according to a Ninth Air Force staff study on the performance of the TACP's in the exercise, there was no appreciable improvement in the volume of traffic that could be handled, in readability, or in ruggedness.[52] As a possible solution to the challenge of finding a suitable TACP vehicle and reliable communications, this report suggested that the H-13 light helicopters be used. The H-13, equipped with a packaged UHF radio set, would greatly extend the range of communication. Equipment would be less subject to shock and damage than equipment carried overland by jeep, and it could also be moved readily to rear areas for maintenance. Fewer TACP's would be needed; controllers with their light helicopters could be located at the division fire support coordination center (FSCC) and could move in a matter of minutes to the forward areas to direct strikes.[53]

This last feature was particularly appealing to the Air Force because of a controversy with the Army over the number of TACP's the Air Force should furnish to each infantry division. The Army wanted 13 TACP's per division—one for each battalion in the three infantry regiments, one for each regimental command post, and one for the division FSCC. The Air Force took the position that the

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*For further discussion of TACP communications see below, p. 71.

TACP is the final link in the air commander's control system and that it is his responsibility to provide control parties when, where, and in the numbers he considers necessary. Far fewer TACP's would be needed if the highly mobile light helicopter were substituted for the road-bound jeep. The Ninth Air Force TACP study estimated that three controllers, qualified to fly the helicopter, plus maintenance personnel, could fulfill the control function for an infantry division.[54] The study did not, however, go into the matter of the helicopter's vulnerability to enemy ground fire and air attack. This would seem to be a limiting factor, especially if the helicopter were used, like a Mosquito aircraft, for airborne control.

In LONG HORN all forward controllers and air liaison officers were assigned to the Forward Air Control Squadron (Prov).* The exercise was expected to test the squadron under simulated combat conditions. From the beginning the new unit was beset with difficulties; many of the personnel were not qualified and had to be hurriedly trained, and much of the unit's equipment arrived too late for proper testing. The squadron commander felt that the exercise provided no real test of the unit since, for all practical purposes, TACP operations had been conducted in the same way as in previous exercises—by the forward air control section of the tactical control group's tactical control squadron. Ninth Air Force believed that the experience gained by the provisional squadron was valuable but not conclusive enough to warrant definite recommendations.[55]

Troop-Carrier Operations

Although airborne operations in Exercise LONG HORN were on a smaller scale than in Exercises SOUTHERN PINE and SNOW FALL, troop-carrier units carried out two personnel drops of regimental combat team size and engaged in aerial supply operations and aeromedical evacuation activities. Troop-carrier operations included the use of assault aircraft and helicopters. Originally, Army plans gave the troop carriers a very limited role in the exercise.† But when these plans were modified to allow for more troop-carrier participation, the Eighteenth Air Force, because of its high morale, enterprise, and technical skill, found an important place for itself in the maneuver and demonstrated its ability to support the ground forces in all phases of troop-carrier activity.[56]

Paratroop Drops

The two paratroop drops were carried out successfully. However, newspaper accounts of the M-day drop of the Aggressor 325th RCT drop were very critical of the troop-carrier performance. The drop was called "sloppy," and there were references to the "dangerous positions and altitude of aircraft." Eighteenth Air Force (Adv) believed that these comments originated with a colonel from the Office of the Chief of Army Field Forces and other non-airborne and non-Air Force officers present at the DZ.[57]

In commenting on these criticisms Brig. Gen. L.V. Murrow, commander of Eighteenth Air Force (Adv), explained that the use of 18-ship serials in six-element vees in trail formation presented some problems because of the long, strung-out columns and the danger of prop wash. There was, he said, some "accordion movement" in the third and fourth serials; but there was no "over-running," and although the serial interval was slightly closed, no real danger existed at any time in any serial. As evidence that the drop was a good one the general noted that the number of reserve parachutes used was uniform throughout the entire formation; that the pattern on the ground was excellent; that the speed, altitude, and timing of the aircraft were in accordance with joint standing operating procedures; and that no personnel were seen to land outside the limits of the DZ. Summing up, he stated that the drop had been accomplished safely and with results that were generally far above the average.[58]

Brig. Gen. James Ferguson, commander of Ninth Air Force (Adv), in a message sent to Tactical Air Command on the day of the drop, indicated that a ragged formation was flown by the third

*See above, p. 57.

†See above, pp. 48-49.

serial, a circumstance he attributed to the use of the vees in trail formation. He added that Eighteenth Air Force (Adv) needed to concentrate on practice formation flying before the next scheduled drop. General Ferguson did state, however, that according to reports of reconnaissance pilots and aerial observers, the concentration of paratroops within the DZ was excellent.[59] The claim that the results of the drop had been good was supported also by Maj. Gen. C.D.W. Canham, the 82d Airborne Division commander, who praised the drop as the most successful peacetime drop of the division.[60]

These comments show that newspaper criticism of the M-day drop was largely unfounded. However, it is apparent that there was some difficulty with formation flying. Eighteenth Air Force (Adv), discussing the exercise as a whole, stated that the greatest deficiency in connection with the training of troop-carrier units was formation flying between the initial point and the DZ and recommended that each troop-carrier wing devote one week out of eight at its home station to the practice of this technique, using 18- and 36-ship formations.[61]

Other aspects of the M-day airborne operation were marked by a considerable lack of realism. Information concerning the operation, as well as the location of the DZ, had been reported in commercial radio broadcasts on M minus 1. Troop-carrier aircraft flew a course that placed them within range of much of the U.S. forces' artillery and would probably have suffered heavy losses from antiaircraft fire. Furthermore, the area selected for the DZ was within range of at least five battalions of U.S. forces' artillery.[62]

The drop of the 508th RCT on M plus 14 (8 April) was well executed. Formation flying was good despite the handicap of winds that ranged from 8 to 14 miles per hour. All paratroops landed in the middle third of the DZ except for one stick that jumped early and landed in trees near a river bank. When the main body of paratroops jumped, the wind had increased to approximately 15 miles per hour and as a result paratroop casualties were heavy. Of the 3,150 who jumped, 212 were injured, 102 of them seriously enough to require hospital treatment.[63]

Supply and Equipment Drops

Several troublesome features appeared in connection with the supply and equipment drops conducted by Eighteenth Air Force (Adv). Some of the equipment drops failed because of the "whipping" or improper attitude of pilot parachutes used to extract the loads from the aircraft, and several loads of heavy equipment were jammed against the interior of the aircraft. Damage to the planes was serious enough to prompt the recommendation that side skid panels be installed so that equipment or platforms could not jam. On some occasions, the Army 6,000-pound load-bearing platforms, upon leaving the aircraft, would "soar" or "float" for an instant, causing the extractor bar to strike the horizontal stabilizer of the aircraft. Three C-119's and two C-82's were damaged in this way. As solutions the Eighteenth Air Force (Adv) recommended that a platform other than the Army 6,000-pound type be developed and that tests be conducted with a view to redesigning such items as the extractor bar, the shot pack and ejection parachute, and the trigger mechanism for the release of loads.[64]

Assault-Landing Operations

The Eighteenth Air Force (Adv) in Exercise LONG HORN also directed the assault-landing operations of the C-122 assault aircraft and H-19 helicopters of the 16th Troop Carrier Squadron, Assault (L). In its report the 16th Squadron complained that its capabilities were not fully exploited during the exercise and that there was insufficient opportunity to demonstrate its potential, because of a lack of suitable assault-landing areas. Late in the planning phase maneuver director headquarters notified the squadron to select such areas, but the request came at such a late date that they could not be used. The squadron recommended that during the planning for future exercises a representative of an assault unit be present to assure greater use of assault aircraft.[65]

The 16th Squadron also found that its operations in LONG HORN were confined almost entirely to the support of airborne operations. The exercise failed to take advantage of the assault aircraft's ability to support rapid advances of armored or infantry units, a type of support that would entail air-

landings of troops, equipment, and supplies in forward areas. The H-19 assault helicopter, which was used primarily for aeromedical evacuation, could have been employed for guerilla activity and for emergency supply work. The squadron had come to the exercise prepared to conduct night operations, but this capability was not used. In future exercises, the squadron believed, planners should consider that conventional and rotary wing assault aircraft can be used as a team to support all types of ground units under any and all conditions.[66]

Exercise LONG HORN did provide a further test of the 16th Squadron's C-122 assault-type aircraft. Since the C-122 was the first aircraft designed for assault work, it was natural that it should have certain shortcomings. These deficiencies were implied in the squadron's recommendation that future assault aircraft be overpowered for normal operations, have more visibility from the cockpit to the rear and side, have a low footprint pressure, more stability under instrument flight rules conditions, a slower approach speed, and litter attachments that could be installed quickly.[67]

Aeromedical Evacuation

Operations by Eighteenth Air Force (Adv) in Exercise LONG HORN involved two interservice controversies—aeromedical evacuation and the operation of aerial ports. For both of these activities a compromise arrangement applicable only to LONG HORN was worked out by TAC and OCAFF shortly before the exercise got under way.

The aeromedical evacuation compromise was hardly an equitable one as far as the Air Force was concerned. The Army was to evacuate simulated casualties from the forward areas to division clearing station; evacuation rearward from the division clearing stations was to be handled by the Air Force. The maneuver surgeon, however, ruled that simulated casualties would not be evacuated farther than the division clearing stations, for the reason, evidently, that field commanders wanted to maintain a full complement of men at the front. As a result of this decision, the Air Force was shut out of the simulated play, and its aeromedical evacuation training was curtailed.[68]

The TAC-OCAFF agreement also specified that actual casualties were to be evacuated by the most expeditious means available to a point of definitive treatment. The principal Air Force complaint here concerned the Army requirement that casualties, even when they were being evacuated by air, pass through each link in the Army evacuation chain on their way to a point of definitive treatment. According to the 1st Aeromedical Group there were numerous instances where this requirement subjected patients to needless handling and delay. For example, during the drop of the 508th RCT on 8 April the Army required that all casualties evacuated from the battalion aid station on DZ Blue pass through the clearing station on DZ Red before being moved to the 24th Evacuation Hospital. In all 81 casualties were picked up at DZ Blue by helicopters and delivered to the clearing station on DZ Red; after they were processed, other helicopters flew them to the evacuation hospital. To the 1st Aeromedical Group it seemed that these casualties could have been flown from DZ Blue directly to the hospital. The group believed that the procedure that was followed placed an unnecessary strain on evacuation facilities and subjected the patients to undue hardship by delaying their movement to a definitive treatment center.[69]

The evacuation procedure was more severely criticized in the report of a Tactical Air Command staff visit to LONG HORN. The report called the procedure followed during the 8 April drop "apparently useless, wasteful, and inhumane." The Army view was that intermediate stops in the evacuation chain were necessary in order to screen casualties, many of whom could be quickly returned to combat. Movement by air from points of initial treatment to hospitals many miles in the rear, the Army argued, would give casualties the feeling that they were "over the barrier" in the evacuation chain. Many potential psychoneurotics would become actual psychoneurotics if crossing this barrier were made too easy. The Air Force answered that casualties would soon learn that the same aircraft that took them to the rear could quickly return them to the front.[70]

Tactical Air Command was disturbed also by the part of the maneuver director's final report that dealt with aeromedical evacuation. The following was among the conclusions contained in the maneuver surgeon's portion of that report:

> Aeromedical evacuation of casualties within a field army can be successfully accomplished by army aviation, placing major dependence on army transportation helicopter companies and (Army) air ambulance detachments. Air evacuation by air force is well suited to mass evacuation of casualties from mobile army surgical hospitals and evacuation hospitals to destinations in rear of the rear boundary of the army service area; to the support of air-drops by airborne troops; to movements of patients rearward from the communication zone; and to carry out emergency missions on request.[71]

This point of view was further expressed in the surgeon's recommendation that future joint Army-Air Force maneuver agreements on air evacuation should direct that evacuation of simulated casualties by air to any destination within the field army area be an Army responsibility.[72]

Tactical Air Command objected to these parts of the surgeon's report on the grounds that they represented entirely an Army viewpoint, which had been included without any coordination with the air surgeon on the maneuver surgeon's staff. Since these views were made part of the maneuver director's final report, which was in effect a joint report, the impression was created that they had been sanctioned by both services.[73] A suggestion by TAC that changes in this part of the final report be worked out in a TAC-OCAFF conference was turned down by OCAFF.[74]

Certainly the maneuver surgeon's report failed to reflect the Air Force view that aeromedical evacuation was primarily an Air Force responsibility. Strong arguments supporting this position were advanced by the 1st Aeromedical Group following its participation in the exercise. Based on its experience in SNOW FALL and LONG HORN the group believed that a coordinated, theater-deep air evacuation system should be operated by the Air Force, and the following arguments were among those advanced in support of this position:

1. The costly duplication of already existing communication, tactical control, liaison, and aviation medicine facilities would be avoided.

2. An enormous saving in aircraft requirements could be effected by using the same troop-carrier aircraft that bring personnel and supplies to the front to evacuate casualties, thus avoiding dead head return trips.

3. The continuity present in the already existing troop-carrier element of the tactical air arm, from the rear of the theater boundary to the farthest point forward at which rotary or fixed-wing aircraft can land, would provide a more efficient system of evacuation than could be obtained by a junction of two systems of air evacuation at some intermediate point in the theater, with its resultant overlapping and duplication.[75]

These strong arguments did not prevail. There was no reflection of this point of view in the maneuver director's final report. More important, a few months after LONG HORN, on 4 November 1952, the Secretary of the Army and the Secretary of the Air Force signed a memorandum of understanding between the Army and the Air Force assigning to the Army primary responsibility for "aeromedical evacuation within the combat zone [defined as being normally from 50 to 100 miles in depth], to include battlefield pickup of casualties, their air transport to initial point of treatment and any subsequent move to hospital facilities within the combat zone." Air Force aeromedical evacuation functions were limited by this memorandum to the evacuation of casualties "from the initial point of treatment or point of subsequent hospitalization within the combat zone to points outside the combat zone, and in airborne operations, the evacuation of all casualties from the objective area until such time as ground link-up is attained."*[76]

Aerial Port Operations

At issue during Exercise LONG HORN was the matter of responsibility for the operation of aerial ports. Only a few days before the exercise began, TAC and OCAFF reached an agreement,

*Although this memorandum of understanding appeared to provide a reasonably clear-cut division of responsibility for aeromedical evacuation, it did not prevent further interservice controversy over this problem. See below, pp. 89-90, 117-18.

applicable only to LONG HORN, that outlined the functions of the Air Force's 1st Aerial Port Operations Squadron and the Army's 601st Quartermaster Aerial Supply Company and 349th Transportation Port Company.* Most of the actual work was done by the Army units; the Air Force was limited to responsibility for and the supervision of the loading, lashing, and ejection of cargo from troop-carrier aircraft. The Army units were to package, temporarily store, and prepare supplies for aerial delivery and establish aerial ports of embarkation and debarkation for assault type aircraft in the combat zone, and no mention was made of any Air Force responsibility for or supervision of these activities.[77]

Apparently the Air Force agreed to this arrangement solely because the 1st Aerial Port Operations Squadron, which had been activated only a few months before LONG HORN, lacked the experience and equipment needed to carry out all the activities involved in the operation of aerial ports. The Army units, on the other hand, had been organized, trained, and equipped for some time, and they arrived at LONG HORN fully prepared to carry out aerial port operations in conformance with Army doctrine. Under these circumstances it was almost inevitable that many functions normal to an aerial port squadron should fall to the Army.[78]

Communications

Exercise LONG HORN, like so many of the training exercises that preceded it, abounded in problems of communication and control. Many of these problems pertained to the tactical air control system, but other Air Force activities were similarly affected. Air liaison officers found their work hampered by communication difficulties; there were deficiencies in point-to-point communication between Ninth Air Force (Adv) and its operating units; Eighteenth Air Force (Adv) had communication troubles.

Criticism of the tactical air control system centered around the location of facilities, radar coverage, TACP operations, and the lack of realism in the deployment of facilities. For U.S. forces the TACC, which is normally located to the rear of the TADC's, was placed forward of the TADC's, between them and the combat zone. Both TADP's were located at the same site, only three miles from the TACC. Similarly, the Aggressor TACC was located far in advance of the TADC and its associated L/W radar units. Because of their rearward location the TADC's had difficulty controlling aircraft in the battle area.[79]

The explanation for this unrealistic positioning of control system facilities is twofold. These facilities, particularly the TADC's, were required to control all air traffic not only in the maneuver area but also in the restricted air corridor leading into and out of the maneuver area. Thus the TADC's had to be placed to the rear of the TACC's. Ninth Air Force (Adv) was restricted in the choice of sites for its control facilities because it was required to operate in a corps-size area rather than in a field army zone.[80]

The radar used in the tactical air control system was generally ineffective, especially the height-finding radar employed by the TADC's and L/W radar units. The 507th Tactical Control Group, which furnished control and warning facilities for the U.S. forces, reported that the height finders could rarely pick up targets. The height-finding radar used by the 157th Aircraft Control and Warning Group for the Aggressor air force did not work at all. There was no identification, friend or foe (IFF) equipment available for the exercise.[81]

The AN/MSQ-1, the close-support-control ground radar used by the TADP's for controlling aircraft operating relatively close to the frontlines, did not have sufficient accuracy for pinpoint navigation or for use as an aid in night reconnaissance, according to the Ninth Air Force.[82] The 118th Tactical Reconnaissance Wing criticized this equipment because of its limited range. Operators had "extreme difficulty" locating, locking on, and maintaining contact with aircraft. As a result, pilots lost confidence in the MSQ-1 and tended to avoid using it whenever possible. The wing felt that the electronic navigational aids used in LONG HORN were unsatisfactory and recommended that the MSQ-1 be improved and that Shoran† equipment be installed for use in future maneuvers.[83]

*See above, p. 56.

†No Shoran beacon facilities were made available for LONG HORN.

It had been hoped that in Exercise LONG HORN there would be some improvement in the long-standing difficulties with TACP communications. Exercise after exercise had demonstrated the ineffectiveness of the AN/VRC-1 jeep-mounted TACP radio. As a replacement for the VRC-1 the Air Force had procured the AN/MRC-20, which was field tested in LONG HORN. However, the test proved to be less than satisfactory. Twenty MRC-20's were delivered by air to the maneuver area just before the exercise began. The sets, for which operation instructions had not yet been published, were flown direct from the factory. There was not time to train operators, and many lacked the experience necessary to operate the new equipment. The old VRC-1's, also used in the exercise, were once again unreliable. The HF radio component in particular was undependable, and this same deficiency hampered the operation of the MRC-20.[84]

Air-to-ground communications in LONG HORN were very unsatisfactory, mainly because of too few VHF radio channels. Fighter-bomber aircraft were equipped with four-channel sets, which were entirely inadequate, and air-ground channels were often saturated.[85]

These deficiencies made it difficult for the Air Force to communicate with and control its aircraft, but also affecting the air effort were certain Army communication shortcomings. The Army air-ground operations system failed to function properly because of difficulties that were encountered in the operation of the AN/GRC-26 radio used in the air-request net. Army personnel were inexperienced in both operation and maintenance. In some instances, spare parts were not available. As a result, communication lines between division and corps and JOC were jammed, and excessive time was required for the transmission of air requests and for dissemination of information. The situation became so bad that in some cases the ground units had to use the air liaison officers' SCR-399 radio net to get their requests through to the JOC. Since the Army put such stress on reducing traffic on its communication nets, some subordinate units were never notified of the acceptance or refusal of their requests for air support, and it was not uncommon for aircraft to arrive overhead for an attack before the ground unit knew they were coming.[86]

Subjected to careful scrutiny by Ninth Air Force was the point-to-point communication system tying together the tactical air force headquarters and the operating units. The 933d Signal Battalion, which set up and operated this system, was handicapped by a lack of trained personnel and by over-age vehicles, many of which were of 1941 and 1942 manufacture. But the Ninth seemed more concerned about the proliferation of tactical air force communication facilities. The communication systems supporting Headquarters, Ninth Air Force (Adv), at North Fort Hood were described as "staggering"; 19 voice and teletype circuits were provided between North Fort Hood and the two fighter-bomber wings at Waco, and 15 circuits linked North Fort Hood with the reconnaissance wing and the air rescue detachment at Temple. According to Ninth Air Force the communication systems for the exercise were so elaborate as to violate the principle that a tactical air force should be capable of operating in forward areas on an austerity basis. The Ninth believed that any increase in weight or personnel in its operational elements that hampered mobility or did not contribute directly to effective combat operations should be "ruthlessly eliminated." The experience of LONG HORN indicated that there was an urgent need for immediate study of tactical air force communication systems in order to arrive at more realistic requirements.[87]

In order to centralize control of all communication and electronic units, Ninth Air Force organized and tested during LONG HORN the Tactical Communications and Electronics Division, Provisional.* After the exercise opinion was sharply divided on the advisability of establishing it on a permanent basis. In general, communication and electronic specialists tended to favor this type of unit, but operations officers tended to oppose it. Those concerned with operations felt that such a unit would tend to give control of communications to specialists who know the technical side but who are not thoroughly familiar with operational aspects.[88]

Troop-carrier operations were also marked by certain communication problems. The AN/ARC-3 VHF radios installed in troop-carrier aircraft operated with a minimum number of malfunctions. During the paratroop drops, however, the operation of the Rebecca-Eureka radar responser beacons used to

*See above, p. 57.

direct aircraft to the DZ's was not completely satisfactory. The portable Eureka (AN/PPN-2), placed in operation on the DZ by the pathfinder teams, had an effective range of only 10 to 12 miles. The 516th Troop Carrier Group attributed this short range to the low altitudes flown by troop-carrier aircraft and to the low power output of the Eureka. The group was convinced that the range could have been appreciably extended if the Rebecca-Eureka equipment had been synchronized before each mission.[89] Less than satisfactory was the performance of the AN/URC-4, a portable VHF and UHF radio used at the forward landing strips during assault landing operations. The 16th Troop Carrier Squadron, Assault (L) found this equipment to be too fragile and too difficult to tune and recommended that a representative from Air Materiel Command accompany the squadron on its next maneuver and assist in the development of equipment to replace the AN/URC-4.[90]

Atomic Weapons Operations

Despite the fact that the atomic play was more comprehensive than in previous exercises and included the use of 11 atomic weapons, no air-delivered atomic weapons were used in close support of friendly forces. Even before the exercise began both the Army and the Air Force realized that such operations might not materialize since Aggressor troops were so few in number that a profitable atomic target was not likely to appear. Ninth Air Force felt, however, that a hypothetical enemy ground situation should have been developed to provide training in the tactical employment of atomic bombs in close-support operations and training also in joint planning procedures.[91]

To Ninth Air Force it seemed that the failure to employ air-delivered atomic weapons in close support of friendly ground troops stemmed not so much from the lack of suitable targets as from certain interservice differences relative to the tactical employment of these weapons. These differences centered around the matter of control of atomic weapons in a theater of operations. The Air Force took the position that control should rest with the theater commander and that joint planning for the air delivery of atomic weapons used in close support should be carried on in the JOC at numbered air force-field army level. The Army, according to Ninth Air Force, held that control of such weapons could be delegated to corps commanders, who would also be responsible for the planning.[92]

In support of its contention that this was indeed the Army position, Ninth Air Force pointed out that during LONG HORN the Army made no provision for joint atomic weapons planning at numbered air force-field army level; the G-2 and G-3 air staffs in the JOC were not qualified in special weapons and apparently were not charged with joint planning responsibilities in this field. When Ninth Air Force officers expressed the desire to conduct at the JOC joint planning for air delivery of close-support atomic weapons, the Army invariably countered with the proposal that qualified Air Force officers be assigned to corps to assist in the planning of such operations.[93]

To Ninth Air Force it seemed that the Army considered a request for an atomic close-support strike to be something in the nature of a directive that, presumably, could be issued at corps level and that would specify the bomb yield, burst height, ground zero, type of aircraft to be employed, minimum safe altitude, and direction of attack. The Air Force held that atomic requests should be handled in the same way as any other Army requests for close support and that the Army would submit atomic requests to the JOC at field army-numbered air force level. Joint planning would be carried on in the JOC in the same manner as when conventional weapons were used, and major decisions relative to the air delivery of atomic weapons would rest with the numbered air force commander.[94]

To Ninth Air Force it appeared that in LONG HORN these interservice differences constituted a major barrier to effective joint planning for the use of air-delivered atomic weapons for close support. Moreover, according to the Ninth, the Army's emphasis on controlling such weapons at corps level was closely tied in with the Army's effort to bring about decentralized control of all close air support.[95]

In light of this controversy, Ninth Air Force recommended that prior to the planning for future joint exercises interservice problems pertaining to the tactical employment of atomic weapons be settled at the level of command authorized to establish joint doctrine and procedures.[96]

A further assessment of the atomic play in LONG HORN came from the Joint Atomic Evaluation Group that was attached to maneuver director headquarters. The group found that plans for the employ-

ment of atomic weapons were not properly integrated into operations plans, that immediate and evaluated intelligence was a vital aid in locating atomic targets, that commanders and staffs did not fully appreciate the capabilities of atomic weapons, and commanders failed to exploit the effects of atomic weapons.* Despite the requirement that atomic munitions were to be employed only when decisive results could be achieved, none of the atomic bursts was followed up by decisive action. The atomic play was inhibited by the lack of a realistic simulated atomic burst that would attract the attention of all troops in the vicinity.[97]

The atomic play in Exercise LONG HORN was not without its achievements. Especially valuable training resulted from the Agressor A-bomb drop on the 136th Infantry Regiment of the 47th Division on 3 April. The evacuation, following the burst, of 1,000 simulated litter casualties provided worthwhile experience for medical and G-4 personnel and was considered by many observers to have been the highlight of the entire exercise.[98]

Intelligence

The intelligence play of LONG HORN was subjected to particularly sharp criticism. The 131st Fighter-Bomber Wing and the 118th Tactical Reconnaissance Wing complained that air intelligence received from Ninth Air Force (Adv) was frequently unrealistic, contradictory, or incomplete and was often received too late for use in mission planning. Information on the ground situation received by ground liaison officers was also unrealistic and lacking in continuity.[99]

Ninth Air Force laid most of the blame for intelligence difficulties on the J-2 section of maneuver director headquarters. During the planning phase lack of air intelligence information from this section, especially air order of battle information, made it extremely difficult for the Ninth to prepare its air superiority and interdiction plans. During both the training and operational phases of the maneuver it was necessary for the Ninth's director of intelligence continually to request intelligence information from the J-2 section and to state the type and amount of information needed to sustain logical intelligence play. The failure to appreciate Air Force intelligence requirements was attributed to the lack of early joint planning. In the J-2 section of maneuver headquarters the Air Force was substantially outnumbered by the Army.[100]

Logistics

The most important logistic recommendation to come out of LONG HORN was that an air depot wing be assigned to future large-scale joint exercises. Because Air Materiel Command was unable to provide such an organization for LONG HORN, Ninth Air Force was required to furnish logistical support for all participating Air Force units and had to perform many functions that properly belong to a depot-type unit. This additional burden hampered appreciably the Ninth's normal operations.[101]

Air Umpiring

The problem of air umpiring was subjected to special scrutiny following Exercise LONG HORN. According to a team of observers from the Air University, air umpiring in this exercise was beset with difficulties that stemmed from the lack of full Air Force representation on the umpire planning staff and from the lack of sufficient air umpires for the air play of the exercise. These observers noted that the exercise air umpires were not fully qualified and that the air umpire manual prepared for the maneuver was not clear or complete. To improve air umpiring the Air University observers suggested that in future exercises experienced air umpires take part in all umpire planning, that these officers conduct an air umpire school, staffed by qualified instructors who would serve as key air umpires for the play of the exercises, and that air umpires be assigned to the combat wings in sufficient numbers to provide an air umpire for each mission.[102]

*This criticism applies chiefly to the Aggressor force since it expended three of the four atomic weapons used in close support.

Ninth Air Force took a different approach to the problem of umpiring air action. In LONG HORN and in previous exercises the assessment of damages inflicted and losses sustained by air units was accomplished by relatively inexperienced junior officers assigned to the units as air umpires. To make their assessments, these officers used elaborate damage and loss tables prepared by the umpire group. The Ninth questioned whether the results obtained with this system justified the cost and recommended that consideration be given to the possibility of eliminating unit umpires as such by assigning this task to flight leaders and unit intelligence officers. According to this proposal, a very small group of experienced senior officers would be employed at umpire headquarters to exercise overall control, one umpire would be assigned to the JOC, and one to each operational air base. Such an umpire organization, it seemed to the Ninth, could exercise sufficient control to insure the achievement of maneuver training objectives.[103]

CHAPTER VII

EXERCISE COLD SPOT–PLANS AND OPERATIONS

Exercise LONG HORN was the last of the true joint exercises held by the Army and the Air Force during the period covered by this study (1951-1954). In 1953 the two services began conducting separate exercises, which, held simultaneously in the same general maneuver area, during certain phases involved joint training. For the Air Force the first of these exercises was Exercise COLD SPOT, held in northern New York in February and March 1953 in conjunction with Army Exercise SNOW STORM.

Exercise Aims

The purposes of Exercise COLD SPOT were 1) to conduct cold-weather operations so as to achieve the maximum amount of unit and individual training with emphasis on night operations; 2) to seek refinements and changes in procedures, techniques, and equipment that would increase effectiveness and economy of operations; and 3) to engage in joint operations with the Army as directed by the air commander.[1] Tactical Air Command, in explaining COLD SPOT's relationship to SNOW STORM, stated that "Exercise COLD SPOT was designed specifically to obtain Air Force training over and above that available within the limited scope of Army Exercise SNOW STORM, while participating in that exercise as necessary to satisfy Army training requirements."[2]

Planning

Headquarters, Tactical Air Command (TAC), carried out the initial planning for COLD SPOT. Since this was predominately a troop-carrier exercise, TAC designated the Eighteenth Air Force commander, Maj. Gen. Robert W. Douglass, as Air Commander, Exercise COLD SPOT, and made the Eighteenth responsible for detailed planning. TAC directed also that Ninth Air Force would furnish certain personnel and units, assist in detailed planning for Ninth Air Force participation, and provide any assistance arranged for by mutual agreement between the commanders of Ninth and Eighteenth Air Forces.[3]

Detailed planning got underway on 16 October 1952, when the exercise air commander issued a warning letter to all participants. On 18 October Eighteenth and Ninth Air Forces began a series of conferences that resulted in agreements on logistic support and communication facilities to be provided by Ninth Air Force. Further logistic planning was accomplished in late October and early November during visits by Eighteenth Air Force staff officers to Eastern Air Defense Force, Air Research and Development Command, and First Army and to the exercise bases–Burlington Municipal Airport, Vermont, Griffiss AFB, New York, and Wheeler-Sack Army Air Field, New York. It was generally agreed that the exercise bases would provide participating Air Force units with messing and billeting facilities and that these units would, in turn, help supply necessary maintenance personnel.[4]

By 28 November Air Force planning had reached the point where the air commander was able to issue administrative instructions setting forth responsibilities and procedures for administrative and logistic support of Air Force participants. Within the next week requirements were established for specialized support to be rendered by the Air Pictorial and Charting Service, Air Rescue Service, Air Weather Service, and Airways and Air Communications Service. On 16 December at a meeting between COLD SPOT staff officers and the New York Regional Airspace Subcom-

mittee arrangements were made to establish special caution and danger areas for the exercise. Aircraft approach and letdown procedures at the exercise bases and procedures for identification of aircraft moving to, from, and within the exercise area were established in letters of agreement signed late in January by the Boston Air Route Traffic Control and by the exercise base commanders. On 12 January 1952 COLD SPOT headquarters distributed the exercise general plan, which had been prepared by the staffs of Eighteenth and Ninth Air Forces.[5]

Planning for COLD SPOT operations directly connected with SNOW STORM was carried out in November 1952 in conferences between the COLD SPOT air commander and his staff and the commanders and senior staff officers of SNOW STORM headquarters, First Army, and the 82d Airborne Division. Further joint planning was required to insure that the two exercises would have a similar intelligence situation. In December the COLD SPOT and SNOW STORM intelligence sections decided in conference that the Air Force would develop the intelligence play for the entire northeastern United States and that the Army would devise the ground intelligence situation for the Camp Drum area, where the ground maneuver was to be held. Plans for airborne operations were written by representatives of Eighteenth Air Force and the 82d Airborne Division at conferences held in November 1952 and in early January 1953.[6]

Organization and Command Structure

Exercise headquarters for COLD SPOT functioned only during the operational and reporting phases of the maneuver. This headquarters, which opened at Griffiss AFB on 2 February 1953, consisted of the air commander and his deputy and a small staff drawn from Eighteenth and Ninth Air Forces. Participating units from the Eighteenth and the Ninth operated under the direct control of the exercise air commander.* General Douglass served as air commander, and his deputy was Brig. Gen. Edward H. Alexander, deputy commander of Eighteenth Air Force.[7]

The Exercise SNOW STORM planning staff was officially organized on 1 November as Headquarters, Exercise SNOW STORM, which opened at Camp Drum on 6 January 1953. The staff was composed of personnel from First Army, XVIII Airborne Corps and the 82d Airborne Division. Exercise director was Lt. Gen. Withers A. Burress, Commanding General, First Army; his deputy was Maj. Gen. Gerald J. Higgins, commander of the 82d Airborne Division. Operating directly under the exercise director were U.S. Army Forces, headed by General Higgins, and Aggressor army forces, led by the commander of the 278th Regimental Combat Team (RCT), Col. Howard N. Smalley.[8] Since Exercises COLD SPOT and SNOW STORM were unilateral exercises, there was neither joint headquarters nor joint maneuver staff. Joint aspects of the two exercises were supervised by means of liaison and coordination between Air Commander, COLD SPOT, and Exercise Director, SNOW STORM.†

Participating Units

Eighteenth Air Force units assigned to Exercise COLD SPOT included the 314th Troop Carrier Wing and detachments from the 62d and 313th Troop Carrier Wings, 7th Liaison Squadron, 1st Aeromedical Group, 1st Aerial Port Operations Squadron, and 4418th Communications Group. Ninth Air Force participants included the 366th Fighter-Bomber Wing and detachments from the 66th Tactical Reconnaissance Wing, 727th Aircraft Control and Warning (AC&W) Squadron, and 941st Forward Air Control Squadron.[9] No Aggressor air force was employed. However, the 366th Fighter-Bomber Wing flew close-support missions for the Aggressor as well as for friendly forces engaged in Exercise SNOW STORM.[10]

In SNOW STORM the major friendly ground unit was the 82d Airborne Division; acting as the Aggressor ground force was the 278th RCT (less one infantry battalion) and the reconnaissance company and an antitank platoon of the 82d Airborne Division.[11]

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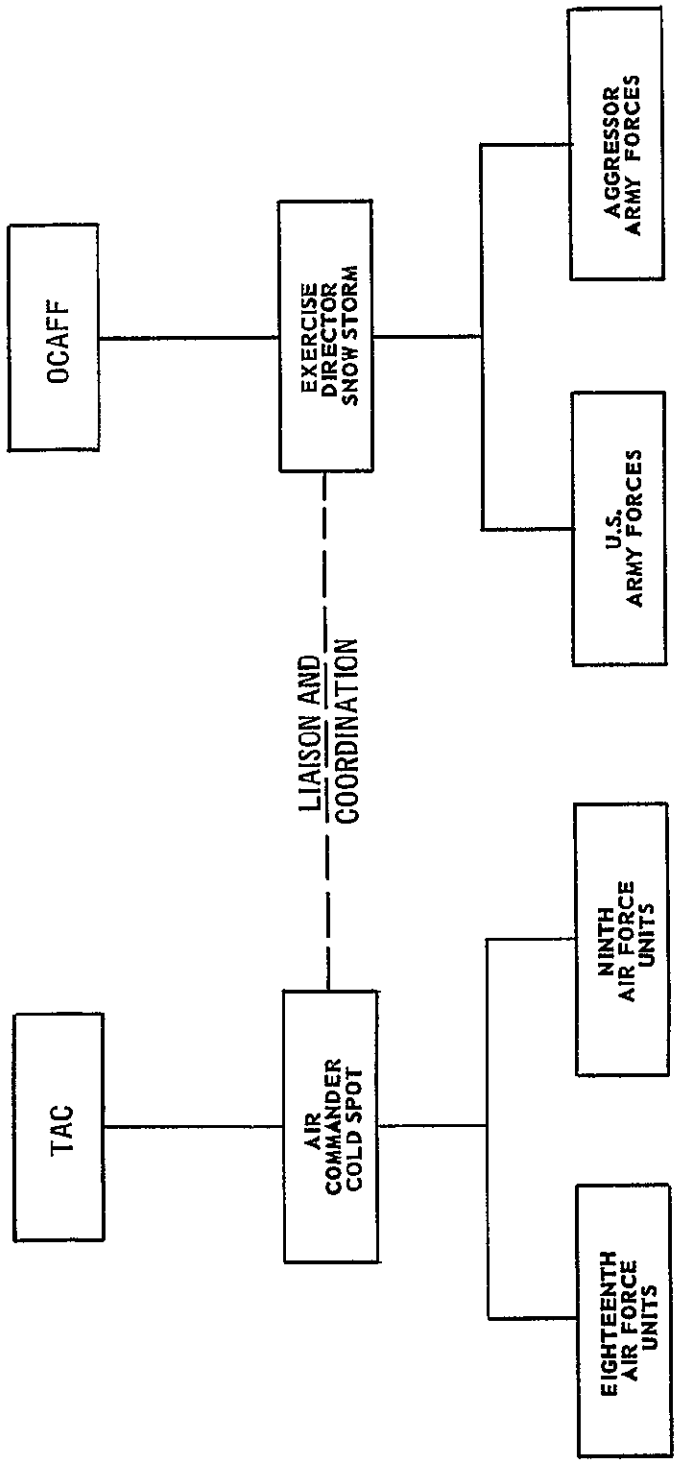
*See Chart 4.

†*Ibid.*

CHART 4

ORGANIZATION

Exercises COLD SPOT and SNOW STORM



Exercise Bases

During COLD SPOT Air Force units operated from Griffiss AFB, New York, Burlington Municipal Airport, Vermont, and Wheeler-Sack Army Air Field, Camp Drum, New York. Located at Griffiss were COLD SPOT headquarters, the 366th Fighter-Bomber Wing, and the detachments from the 66th Tactical Reconnaissance Wing, 62d and 313th Troop Carrier Wings, and 7th Liaison Squadron. The 314th Troop Carrier Wing was based at Burlington. The 314th Wing's 16th Troop Carrier Squadron, Assault (L) and 644th Troop Carrier Squadron, Assault (Rotary Wing), as well as the detachments from the 727th AC&W Squadron, 941st Forward Air Control Squadron, and 1st Aeromedical Group, operated from Wheeler-Sack. At each of the exercise bases—Griffiss, Burlington, and Wheeler-Sack—there was a detachment from the 1st Aerial Port Operations Squadron.[12] Air Force units moved to their maneuver bases by means of their organic aircraft or motor vehicles or by airlift furnished by Eighteenth Air Force. All units were in place by 9 February.[13]

Army Exercise SNOW STORM was held in the Camp Drum maneuver area, near Watertown, New York. SNOW STORM headquarters moved to Drum early in January, and all units of the 82d Airborne Division were in place at Drum by 25 January. For the 278th RCT no movement was necessary since this unit had been at Drum for some time, serving as a training cadre for National Guard and Organized Reserve Corps units.[14]

Exercise Phases

Exercise COLD SPOT was conducted in five phases. Phase A (1-31 January) consisted of the training of units at their home stations. Phases B (5 January-9 February) and E (12-19 March) covered respectively the periods during which units moved to their maneuver bases before the exercise and returned to their home bases after the exercise. During these periods air mobility and air transportability training were emphasized. Unilateral Air Force training and joint training held in conjunction with Army Exercise SNOW STORM were carried out during Phases C and D. Phase C (10-21 February) coincided with Phase II of SNOW STORM and Phase D (22 February-12 March) with Phase III.[15]

Exercise SNOW STORM was conducted in three phases. During Phase I (November-December 1952) cold-weather training for the 82d Airborne Division and other participating units was held at their home stations and at Camp Hale, Colorado. Phase II (12 January-7 March 1953) consisted of acclimatization and individual and unit training in the Camp Drum area. In Phase III three regimental combat team exercises were conducted at Camp Drum during the period 24 February-12 March. Each exercise lasted three days with a four-day interval between exercises.[16]

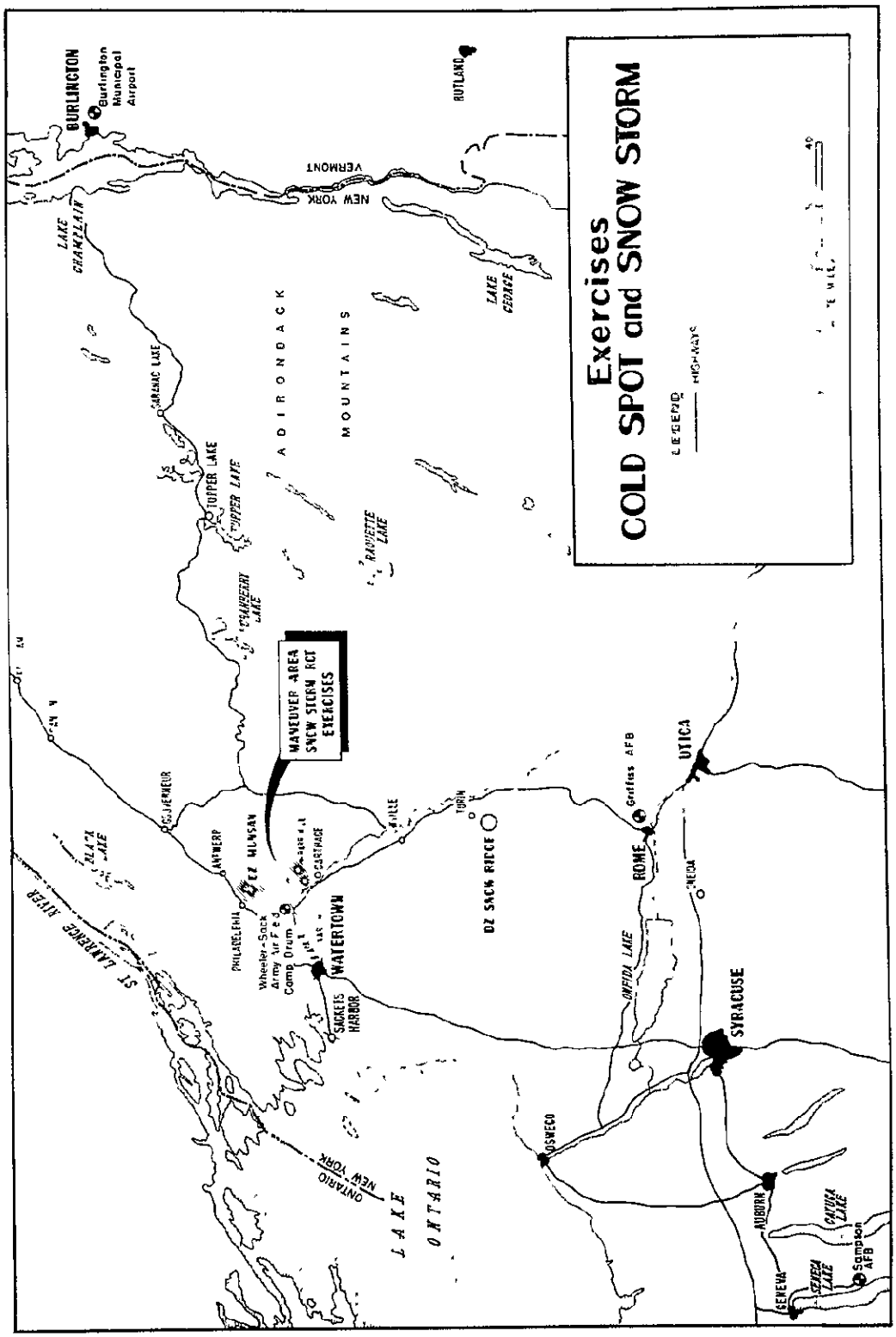
Pre-Exercise Training

Pre-exercise training for COLD SPOT centered around unit flying, ground training, and cold-weather indoctrination. Troop-carrier units concentrated on night formation flying, low-level night navigation flights, and simulated night paratroop drops. The 366th Fighter-Bomber Wing completed a comprehensive cold-weather indoctrination and flying training program and ran tests of equipment to be used in the exercise for chemical spray missions that had been requested by the Army. During this period steps were taken to prepare the 4418th Communications Group for the exercise. Over 60 percent of the unit's personnel and equipment was obtained from outside sources, and an intensive two-week training program had to be conducted in order to get the unit ready for COLD SPOT.[17]

Phase C Air Force Operations—Reconnaissance and Fighter-Bomber

Operations by reconnaissance, fighter-bomber, and troop-carrier units in the COLD SPOT maneuver area began on 10 February, the opening day of Phase C (10-21 February). During this phase the 66th Tactical Reconnaissance Wing detachment, equipped with four RF-80's and three RB-26's,

MAP 4



flew daily weather reconnaissance missions and provided visual and photo reconnaissance for Army units engaged in Phase II of Exercise SNOW STORM. The detachment also took vertical photos of troop-carrier serials—photos that were used to check formation intervals—and photos that showed the ground pattern immediately after the drop. In Phase C of COLD SPOT the reconnaissance detachment flew 52 sorties, and its photo lab processed 2,284 feet of film and made 5,587 prints.[18]

Fighter-bomber activity during Phase C included training in armed reconnaissance, navigation, formation flying, and the use of ground-controlled approach. The 366th Fighter-Bomber Wing, equipped with 20 F-51's, flew 32 interdiction sorties and 26 close-support sorties. In addition, the wing carried out 14 chemical spray sorties and 8 sorties that were controlled by AN/MSQ-1 ground radar. According to the original plans for Phase C the 366th Wing was to provide close support for the paratroops who were to be dropped during Phase II of Army Exercise SNOW STORM. Because of the cancellation of most of these drops, close-support operations were sharply curtailed. However, arrangements were made to provide close-support training for the 82d Airborne Division's tank battalion and combat engineers. The 366th Wing also carried out seven close-support strikes for the Aggressor force.[19]

Phase C Troop-Carrier Operations

Troop-carrier operations during Phase C of COLD SPOT and Phase II of SNOW STORM were to include, over a period of about ten days, the dropping of 13,000 paratroops of the 82d Airborne Division on DZ Munsan, located on the Camp Drum Military Reservation.* The purpose of the drops was to enable each paratrooper in the division to make one jump under cold-weather and snow conditions. On 10 February 22 C-119's of the 314th Troop Carrier Wing dropped 512 paratroops and six heavy-equipment loads on DZ Munsan. However, because of the frozen ground, the small amount of snow cover, and winds of 15 miles per hour or over, the paratroops suffered heavy casualties. There were 38 casualties in all, representing an injury rate of 7 percent, a figure that was considered unacceptable for a training exercise.† So that training could continue, maneuver rights were obtained near Turin, New York, where snow conditions were ideal, and the remaining drops were conducted at DZ Snow Ridge, located near Turin and about 40 miles south of Wheeler-Sack Army Air Field.†† In Phase C, 52 C-119's of the 314th Troop Carrier Wing and 9 C-46's of the 313th Troop Carrier Wing dropped 9,118 personnel and 24 items of heavy equipment.[20]

Phase C Aeromedical Evacuation

In Phase C of COLD SPOT and Phase II of SNOW STORM both the Air Force and the Army carried out air evacuation of casualties from the DZ's. The SNOW STORM exercise director proposed that Air Force and Army aircraft and medical units conduct evacuation on alternate days in order to provide training for both services. Although in an airborne operation air evacuation carried out prior to the paratroops' link-up with the ground troops is an Air Force function, this phase of the exercise involved individual training jumps rather than an airborne operation and the Air Force agreed to the Army proposal.[21]

During Phase C the 1st Aeromedical Group and H-19 helicopters of the 644th Troop Carrier Squadron, Assault (Rotary Wing), evacuated 34 actual casualties from the forward areas to the Camp Drum station hospital. Medium troop-carrier aircraft (C-119's) flew patients from Camp Drum to their home stations. For training purposes these were considered to be intratheater evacuation missions. Intertheater evacuation was performed by the Military Air Transport Service (MATS), which flew patients needing specialized hospitalization to appropriate treatment centers. Prior to this move C-119's transferred the patients from the Camp Drum hospital to Griffiss AFB, the MATS theater air terminal.[22]

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*See Map 4.

†The 82d Airborne Division's average injury rate for 1952 was only .27 percent.

††See Map 4.

SNOW STORM Regimental Combat Team Exercises

For Phase III of SNOW STORM, the regimental combat team phase, and Phase D of COLD SPOT it was assumed that an Aggressor force had driven south across the St. Lawrence River and into the northeast United States, and in late February 1953 U.S. and Aggressor forces in upstate New York were in contact along a line running through the towns of Sackets Harbor, Watertown, Carthage, Tupper Lake, and Rouses Point. The mission of destroying the Aggressor forces south of the St. Lawrence was given to First Army, which was composed of XVIII Airborne Corps and V Corps. To carry out its part in this offensive XVIII Airborne Corps had available the 11th and 37th Infantry Divisions, both simulated units, and the 82d Airborne Division. It was planned that on 24 February the 82d would make an airborne assault behind Aggressor lines in the Philadelphia, New York, area in order to block Aggressor routes of withdrawal to the north and to help XVIII Airborne Corps effect a crossing of the Black River.[23]

Phase III of SNOW STORM consisted of three separate regimental combat team (RCT) exercises, one for each of the three RCT's of the 82d Airborne Division.* In general, each exercise was based on the hypothetical situation outlined above, and each was played over the same terrain. On the morning of D-day for each exercise troop-carrier aircraft "dropped"† an RCT on DZ Munsan. After securing the DZ the RCT attacked toward the southeast for two and one-half days, advancing a distance of about 10 miles during that period. Each of the problems ended about midway through D plus 2, after the RCT had driven the Aggressor into the southeast tip of the Drum reservation in the vicinity of Ward and Barr Hills.††[24]

Phase D Air Force Operations—Reconnaissance and Fighter-Bomber

Most of the Air Force activity during Phase D of COLD SPOT was directly connected with the SNOW STORM regimental exercises. In this phase the 66th Tactical Reconnaissance Wing detachment RF-80's and RB-26's flew a total of 101 sorties, and the photo lab processed 3,560 feet of film and made 8,870 prints. During each RCT exercise the detachment flew day and night visual, photo, and armed reconnaissance missions and provided photo coverage of troop-carrier formations. During Phase D 366th Fighter-Bomber Wing F-51's flew a total of 233 sorties, most of them interdiction sorties and close-support and chemical spray (tear gas) sorties, for both friendly and Aggressor ground forces engaged in the SNOW STORM regimental exercises.[25]

Phase D Troop-Carrier Operations

Troop-carrier activity in Phase D of COLD SPOT and Phase III of SNOW STORM included simulated and actual personnel drops, dropping and assault landing of supplies and equipment, and aerial port and aeromedical evacuation operations. Because of high winds and the lack of snow cover on the frozen ground of DZ Munsan, the 82d Airborne Division commander canceled all actual personnel drops. To provide some measure of realism each of the RCT's was moved by truck from the marshaling area at Camp Drum to DZ Munsan, where a "tail gate" drop was executed to simulate the actual drop from troop-carrier aircraft.[26]

Also in the interest of realism and to provide training for troop-carrier units, troop-carrier aircraft marshaled at Wheeler-Sack Army Air Field and carried out simulated personnel drops over DZ Munsan. On 24 February 24 C-119's, flying in formation, simulated the drop of the 325th RCT, the 505th RCT was "dropped" by 30 C-119's on 3 March, and the 504th RCT by 30 C-119's on 10

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*The RCT exercises were conducted on the following dates:

325th RCT	24-26 February
505th RCT	3-5 March
504th RCT	10-12 March

†Because of high winds and lack of snow cover on the frozen ground of the DZ, all paratroop drops had to be simulated.

††See Map 4.

March. Also during this period, but not connected with the RCT exercises, 1,799 paratroops were dropped on DZ Snow Ridge.[27]

Equipment and supply drops on DZ Munsan were also curtailed by the weather. During the first RCT exercise on 24 February C-119's dropped 47 door bundles on Munsan and 12 C-119's dropped 145,300 pounds of heavy equipment. Other heavy-equipment drops scheduled for 24 February were canceled by the airborne commander because of high winds. On 3 March, during the second RCT exercise, bad weather again forced the cancellation of actual heavy drops, but six C-119's flew heavy-drop missions using simulated loads. Actual heavy drops planned for the third RCT exercise also had to be scratched. Assault-landing operations were confined to the first two exercises, and C-122 assault aircraft landed 44,136 pounds of equipment on the Munsan landing zone (LZ) during the first exercise and 26,185 pounds during the second.[28]

An important feature of airborne operations in COLD SPOT-SNOW STORM was the use for the first time of an Air Force combat control team to perform the pathfinder function formerly exercised by the Army. In all airborne assault operations the team was employed to mark the DZ's, establish communications, and direct traffic on the LZ. In each case the team was moved into position by Air Force H-19 helicopters or by ground vehicles.[29]

Phase D Aeromedical Evacuation

Air Force evacuation of casualties from the forward areas during the RCT exercises was limited chiefly to the movement of simulated casualties by H-19 helicopters of the 314th Troop Carrier Wing and personnel of the 1st Aeromedical Evacuation Group. Tactical Air Command had assumed, in accordance with an agreement reached with the Office of the Chief of Army Field Forces on 2 January 1953, that the Air Force would carry out all air evacuation of casualties occurring prior to the linking up of the paratroops with the ground forces. However, the Army contended that actual casualties did not come within the terms of the agreement and that such casualties should be moved nontactically by the most expeditious means available, either Air Force or Army.* This Army interpretation sharply curtailed Air Force participation in the air evacuation of actual casualties during the greater part of the RCT phase.[30] During this phase (Phase D of COLD SPOT) Air Force intratheater and intertheater air evacuation were performed in the same manner as during the preceding phase.†

Aerial Port Operations

The 1st Aerial Port Operations Squadron maintained air terminals at Griffiss AFB, Wheeler-Sack Army Air Field, and Burlington Municipal Airport. The 1st Aerial furnished dropmasters, who were responsible for loading, lashing, and ejecting all cargo delivered by parachute or freedrop from troop-carrier aircraft, and loadmasters, who handled the loading and unloading of C-122 assault aircraft.[31]

Communications

Throughout Exercise COLD SPOT control and communication facilities were operated and maintained by the 727th AC&W Squadron, the 941st Forward Air Control Squadron, and the 4418th Communications Group. Only a skeleton tactical air control system was employed. There was neither TACC nor TADC; the system included only a TADP operated by the 727th AC&W Squadron and TACP's, ten of which were furnished by the 941st Forward Air Control Squadron,[32] including three control parties provided by the 366th Fighter-Bomber Wing.

Because COLD SPOT was considered a unilateral rather than a joint exercise, no JOC was established. Army requests for air support were submitted to the fire support coordination center

*See below, pp. 89-90.

†See above, p. 80.

(FSCC) in the Exercise SNOW STORM operations control center. The 82d Airborne Division air liaison officer, who was located at the FSCC, screened all Army requests and forwarded approved requests to the combat operations center in Exercise COLD SPOT headquarters. Requests were then sent as fragmentary orders to the 366th Fighter-Bomber Wing operations section for execution.[33]

Point-to-point communication between COLD SPOT headquarters at Griffiss AFB and the exercise bases at Wheeler-Sack and Burlington was provided by the 4418th Communications Group. Included were teletype facilities and operational and administrative SCR-399 radio nets. In addition, the group furnished an AN/GRC-24A radio-teletype set for direct teletype communication between COLD SPOT headquarters at Griffiss AFB and the TADP, which was located at Dry Hill, near Watertown.[34]

Operation SAMPSON

Air Force activity in Exercise COLD SPOT was by no means limited to operations carried out in conjunction with Exercise SNOW STORM. To give COLD SPOT participants experience in carrying out the theater-wide tactical air mission, the COLD SPOT staff produced Operation *SAMPSON* as a special exercise for Air Force training only. Operation *SAMPSON* was conducted on 13 February over the COLD SPOT exercise area and Sampson AFB, New York. All types of TAC aircraft and facilities participating in COLD SPOT were represented—assault, medium, and heavy troop-carrier aircraft; fighter-bomber, light bomber,* and tactical reconnaissance aircraft; a combat control team; a TACP; and aeromedical evacuation elements. The exercise involved a simulated airdrop and simulated resupply and air evacuation missions, along with simulated fighter strikes and close-support missions.[35]

Night Training

During COLD SPOT the Air Force conducted extensive night training, which was also unilateral. Troop-carrier units practiced night formation flying, including formation takeoffs and landings, and made practice paradrops, using Rebecca-Eureka equipment to help locate the DZ. Combat control teams received training in marking DZ's during these simulated drops. Cold-weather survival training, including overnight bivouacs, were conducted in the field.[36]

Atomic Weapons Operations

There was no atomic weapons play in Exercise COLD SPOT. In Exercise SNOW STORM, however, the Aggressor made one simulated atomic artillery attack against U.S. forces on the final day of each of the three RCT exercises.[37]

*The light bombers were simulated by RB-26's.

CHAPTER VIII

EXERCISE COLD SPOT–FINDINGS

Although Exercise COLD SPOT was a comparatively small-scale exercise, involving only 20 fighter-bombers, a troop-carrier wing, and a reconnaissance detachment, it included virtually all types of tactical air activity and produced a number of results that merit discussion and analysis.

Planning

Planning for Exercise COLD SPOT was generally satisfactory. The only major shortcoming was the delay in the delivery of the COLD SPOT general plan to the participating units. Although the plan was dated 12 January 1953, it was not received by the 314th Troop Carrier Wing until 21 January. The 313th Air Base Group did not get its copy until 22 January, only three days before its advance party was scheduled to leave for the maneuver area. The late arrival of the plan made it difficult for these units to plan carefully for the maneuver. As Eighteenth Air Force pointed out, however, this situation had its brighter side, in that it gave the units experience in getting ready for deployment on short notice from higher headquarters.[1]

Organization

The effectiveness of joint planning for COLD SPOT operations carried out in conjunction with Army Exercise SNOW STORM was a subject of sharp controversy between the Army and the Air Force. Basically this was a dispute over the appropriateness of the separate or unilateral organization of the two exercises. The Army position, as reflected in its final report,[2] was that the joint aspects of the two exercises would have gone more smoothly if there had been a jointly staffed maneuver headquarters or a joint planning agency.*

The Air Force position, as stated by Tactical Air Command (TAC) was that in small-scale exercises of this sort there was no need for a joint headquarters and that the "concept of jointly phased unilateral exercises . . . has proved to be sound, workable and economical."[3] A similar view was expressed in the COLD SPOT final report, prepared at Eighteenth Air Force headquarters. This report recommended that the "concept of unilateral exercises, with joint participation where appropriate, be continued." The report recognized the need for joint planning for such exercises but saw no need for a joint commander or staff.[4]

The Tactical Air Command and Eighteenth Air Force argument in favor of the unilateral type of exercise was based on the belief that past exercises, particularly the smaller ones, conducted under joint command had not fully satisfied Air Force training and testing requirements. Air activity such as air superiority, interdiction, and close support was usually entirely dependent on the various phases of ground action conducted within a relatively small area.† In these exercises there was no opportunity to demonstrate how tactical air can be rapidly shifted within the field army area or from one field army area to another in a theater of operations. Troop-carrier operations in previous joint exercises were too narrow in scope, since they consisted chiefly of the delivery and resupply of airborne forces in a comparatively small area. What was lacking, from the Air Force viewpoint, was

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*The Army report stressed particularly the lack of a joint headquarters or joint task force for airborne operations conducted during the two exercises. See below pp. 87-88.

†In SNOW STORM, for example, Army action was restricted to the Camp Drum reservation, an area measuring approximately 9 by 26 miles.

recognition of the fact that troop-carrier operations carried out in support of airborne operations are only a part of the broad, theater-wide troop-carrier mission.[5]

In unilateral exercises like COLD SPOT, it was argued, the Air Force could discharge its responsibility to provide support for the Army and at the same time furnish its units with experience in the proper employment of airpower in a theater of operations. In COLD SPOT, for example,* the Air Force elements were organized as a simulated major air command, which not only supported the Army in SNOW STORM but also engaged in other operations within the theater.[6]

The viewpoint of Tactical Air Command and Eighteenth Air Force regarding the efficacy of COLD SPOT was not shared wholeheartedly by Ninth Air Force. The Ninth agreed that COLD SPOT and SNOW STORM were too small in scale to warrant the creation of a joint headquarters and staff. But it did not agree that the problem of furnishing Air Force support for small Army exercises was satisfactorily solved in COLD SPOT. The crux of the Ninth's criticism was that neither the Air Force operations carried out in support of SNOW STORM nor the Air Force training conducted apart from SNOW STORM (the Ninth considered this training to have been largely unprofitable) justified the expense of establishing the comparatively large COLD SPOT headquarters and staff.[7] According to the Ninth, it would have been more economical to have supported Exercise SNOW STORM on a routine TAC mission basis and in the same manner as in fire power demonstrations with units operating from their home stations or from staging bases. To the argument that such an arrangement might create the impression that Air Force wings were being allotted to Army divisions, the Ninth answered that adherence to Air Force doctrine could be insured by simulating normal air request procedures and using a senior officer from Ninth Air Force or the division air liaison officer to receive Army requests and act as the combat operations officer of the JOC.[8]

Air Force Operations—Reconnaissance

The operational phase of Exercise COLD SPOT produced a number of significant findings in the fields of reconnaissance, close support, airborne operations, and communications and control. Tactical reconnaissance operations were carried out with a minimum of difficulty, and their effectiveness was well above the average for training exercises. The only major problem faced by the 66th Tactical Reconnaissance Wing detachment was the difficulty of welding its main components into a smooth-working team. The 66th Wing detachment was made up in turn of detachments from the 30th Tactical Reconnaissance Squadron, Night Photo, and the 303d Tactical Reconnaissance Squadron, Photo-Jet. The job of integrating two different types of aircraft—the 30th Squadron detachment was equipped with RB-26's and the 303d with RF-80's—and the elements of two administrative and two supply units into one organization taxed the resources of the 66th Wing detachment. But the detachment commander solved the integration problem by establishing a single unit headquarters.[9]

A noteworthy aspect of reconnaissance operations in COLD SPOT was the success obtained in the use of the M-112 cartridge for night photography. In past exercises night photo operations had been disappointing, there had been a number of equipment failures, particularly of the M-112 cartridge. In Exercise COLD SPOT, however, there was a distinct improvement. Out of the 400 M-112 cartridges used, 385 fired; and from these 385 there were 385 good, clear pictures. Much of this success was due to the work of a 66th Wing airman who developed a new procedure for the use of the M-112 cartridge. A K-19 camera was mounted with a photo electric cell to operate the shutter. The cartridges were set off by a K-37 camera, which was equipped with an A-18 magazine and an A-3 cartridge ejector. This system worked very well and brought a sharp reduction in the malfunction rate of the M-112 cartridge.[10]

A reconnaissance deficiency present in previous exercises was the excessive time consumed in the requesting and delivery of aerial photos. The Exercise SNOW FALL final report indicated that the procedures followed during Phase III of the exercise—the RCT phase—brought a considerable improvement. All RCT requests for photo and visual reconnaissance were controlled and supervised by

*See above, pp. 81-82.

the 82d Airborne Division G-2 air officer, who was located at the SNOW STORM Phase III operations control center,* a procedure that proved highly successful.[11]

Army photo missions were flown by the 66th Tactical Reconnaissance Wing detachment. The photos were processed by the detachment photo lab, mass-produced by a platoon of the Army's 67th Engineer Photo Reproduction Company, and interpreted by Army aerial photo interpreter teams attached to the 67th Company. All of these organizations were located at Griffiss AFB, the maneuver base of the 66th Wing detachment. Good communication and transportation facilities linking Griffiss with Camp Drum, the Army maneuver base, were key factors in the rapid delivery of photos and intelligence information.[12]

A more critical evaluation of reconnaissance activity in COLD SPOT came from the Joint Tactical Air Support Board. The board found that (because of the small maneuver area) too many of the photo requests were for area cover and that proper distribution procedures were not followed. The board noted that the Air Force photo lab did not operate under field conditions and that the Army photo reproduction unit's equipment had not been properly tested and did not function until the last few days of the maneuver.[13]

Close Support

Close-support operations in Exercise COLD SPOT were conducted with above average success. The Army was especially well pleased with the close support supplied by the 366th Fighter-Bomber Wing during the RCT exercises. At the critique for the second RCT exercise, Lt. Col. John C. Speedie, the RCT commander, thanked the Air Force for the "very excellent" air support it had furnished and commented further that "we were able to get it and a lot of it when we needed it."[14] In assessing the RCT phase as a whole the 82d Airborne Division reported that "pre-planned missions were very effective, and requests for 'on call' missions were answered by prompt and accurate air strikes."[15]

The close-support situation, however, was not without criticism. Some ground units failed to make full use of close support, although it was available throughout the RCT phase. This failure indicated a need for further training in air-ground operations. Another deficiency was the failure to establish a bombline, and except in the third RCT exercise, the ground units failed to use panels to mark frontline positions. Although battalion commanders and S-3's generally selected excellent air targets, ground umpires frequently underestimated the destructive power of fighter-bomber aircraft, and as a result the ground forces continued to request strikes on targets that had already been destroyed.[16]

More serious, particularly during the early part of the exercise, was the failure of the Army air-request radio net to function properly. According to the planned air-request procedure, the infantry battalions were to submit their requests by radio direct to the fire support coordination center (FSCC) in SNOW STORM operations control center. However, because of poor radio communication between the battalions and the FSCC, the majority of the requests had to be relayed through regiment by wire and radio. This situation caused considerable delay in the transmission of requests, delay that was especially harmful in the case of immediate requests. Matters did improve as the exercise progressed, and in the final RCT exercise the number of immediate requests that got through to the FSCC far surpassed those submitted earlier.[17]

Control of close-support strikes by TACP's appears to have been quite satisfactory. The 10 TACP's provided by the 941st Forward Air Control Squadron operated effectively despite the fact that they were using the old jeep-mounted AN/VRC-1 radio, which had caused so much difficulty in previous exercises. Once during COLD SPOT the squadron was able to commit all 10 of its

*This center consisted in part of an operation section composed of representatives of the 82d Airborne Division G-2, G-3, and G-4 sections. Also assigned to this center were selected persons from SNOW STORM headquarters, the 278th RCT (Aggressor), and the umpire group. The center functioned in much the same manner as a division headquarters and issued operational instructions and other directives to the RCT commanders.

TACP's simultaneously, an accomplishment that speaks well for the maintenance performed on this old equipment.[18]

Testing the suitability of the H-19 helicopter as a forward air control platform was an important feature of Exercise COLD SPOT. Ninth Air Force called the results "very promising" and estimated that three TACP's using helicopters could effectively take care of the same area covered by 10 TACP's using radio jeeps. The COLD SPOT final report stated that in directing air strikes a TACP using an H-19 could cover five to six times the area normally covered by a TACP using a jeep. The 941st Forward Air Control Squadron was more pessimistic in its appraisal. The squadron's forward air controllers felt that in its present state of development the helicopter was not suitable for use in combat as a mosquito aircraft. Further criticism came from the 504th RCT commander, who observed that there was some confusion when controllers were operating from helicopters and that in some cases there was a breakdown of communications between the ground units and the helicopters.[19]

Airborne Operations

The difficulties encountered in reconnaissance and close-support activities were relatively minor compared to those that plagued airborne operations. The troop-carrier missions that were actually flown were successful and profitable from a training standpoint, but airborne operations as a whole were hampered by bad weather and were marred by a number of serious interservice controversies.

Airborne activities received a severe setback early in the exercise when high winds and the rough, frozen condition of DZ Munsan at Camp Drum forced the cancellation of all remaining personnel drops and some heavy-equipment drops. All troop-carrier missions, however, were actually flown as scheduled, using door bundles to simulate personnel and heavy-drop loads. These simulated drops detracted only slightly from the value of the missions, and staff officers and troop-carrier crews received worthwhile training.[20]

Although few actual personnel drops could be made on DZ Munsan, a large number of drops were made on DZ Snow Ridge, near Turin, New York, where over 10,000 paratroops were dropped during the course of the exercise. Even though these drops were nontactical, they provided useful training, particularly for lead crews. Because of the small size of the DZ all drops were made by aircraft flying singly rather than in formation. In formation flying the wingmen normally drop on the element leader and the elements drop on the formation leader, but in this case each individual crew, in effect, had to act as a lead crew and carry out the complete mission of dropping its load in a relatively small area.[21]

The training jumps at Snow Ridge enabled the Army to accomplish substantially one of its major objectives—gaining experience in airborne operations under the adverse weather conditions that can be expected in the northern latitudes in wintertime. Speaking to this point at the SNOW FALL critique, Brig. Gen. G. J. Higgins, deputy exercise director, stated that the Snow Ridge training jumps had instilled confidence in all personnel and that "we now know that we can execute parachute jumps under cold-weather conditions, that we can rig and eject such heavy equipment as weasels, sleds, and ahkios, etc., and that we can land personnel and equipment without undue difficulty in deep snow."[22]

Important from an overall training standpoint were the benefits received by the 314th Troop Carrier Wing from its participation in the exercise. Just before COLD SPOT the 314th's medium troop-carrier group was increased from two medium squadrons to three. The exercise offered an excellent opportunity to weld the three squadrons into an effective unit, and the 314th Wing by taking advantage of this opportunity came out of the exercise as a trained organization.[23]

Command Structure for Airborne Operations

These beneficial results cannot obscure the fact that the Army and the Air Force were at odds over several aspects of airborne operations as they were conducted in these exercises. In-

cluded were disputes over command structure, over the number of troop-carrier aircraft available for the RCT exercises, and over aeromedical evacuation, aerial port operations, and combat control team activities.

The command structure controversy revolved around the desirability of forming a joint task force for the conduct of airborne operations. Taking the affirmative side, the Army held in its final report on Exercise SNOW STORM that it is desirable if not necessary that airborne training exercises as well as actual airborne operations be conducted under a joint commander with a joint staff. In Exercises COLD SPOT and SNOW STORM the Army believed that the lack of a joint airborne-air force command or joint task force commander for airborne operations was a distinct disadvantage. Specifically, the Army claimed that mutual cooperation rather than joint command decision to determine the amount of troop-carrier support to be allocated to each RCT exercise "did not provide for realistic introduction of airborne forces into the objective area."[24]

A similar view was expressed in the 82d Airborne Division report, which stated that airborne operations should be directed by a joint command and planned by a joint staff. In the absence of such an organization unnecessary delays occur and decisions were too frequently based on compromise. The report noted in particular that in troop-carrier support of a regimental combat team there was disagreement between the Army and the Air Force over the number of aircraft required and over departure, turnaround, and loading times. Since there was no joint headquarters, coordination on such matters had to be carried on by telephone calls and liaison officer visits, needlessly complicating airborne operations.[25]

Tactical Air Command's answer to these criticisms was that there was unity of command at theater level and that "the establishment of joint task forces for accomplishment of normal theater operations is neither necessary nor desirable." TAC saw no need for using joint task forces for normal airborne operations and pointed out that "the successful accomplishment of such operations by co-equal and mutually cooperating Army and Air Force forces has been repeatedly demonstrated." TAC argued further that the settlement of minor differences by compromise was a natural and healthy practice and that more serious deadlocks could ordinarily be resolved by referring them to higher authority. Discussions with the Office, Chief of Army Field Forces, TAC concluded, had "failed to show how use of a joint task force organization would have alleviated difficulties experienced in any given operation."[26]

Shortage of Troop-Carrier Aircraft

The Army and the Air Force also failed to agree on the number of troop-carrier aircraft to be provided by the Air Force for the RCT exercises. Although the Army believed that all the resources available to Eighteenth Air Force were used to support Exercise SNOW STORM, it felt that insufficient aircraft were provided for the RCT exercises. The S-3 of the 505th RCT, which took part in the second of the three exercises, estimated that to move the entire RCT into the DZ-LZ area on D-day would have required 69 C-119's for personnel, 30 C-119's and 1 C-124 for equipment, and 16 C-122's for assault landings of personnel and equipment. For each of the RCT exercises the Air Force furnished only 36 C-119's, 1 C-124, and 2 C-122's. According to the 82d Airborne Division, the result of this disparity was to reduce the RCT drops* to drops of battalion size. Each RCT had to be dropped in three battalion-size increments, which failed to create the desired realism insofar as RCT operations were concerned.[27]

Although the Army estimate of the number of aircraft required for the movement of an entire RCT seemed a little high, there was a shortage of aircraft, and certainly the lack of sufficient airlift hampered RCT training as such. Still, TAC did not feel that the Army criticism was fully justified. Taking the general position that a shortage of troop-carrier aircraft was always present, TAC argued further that the assignment of sufficient aircraft to drop an entire RCT simultaneously, instead of in battalion increments, would have been wasteful since this number would have been out

*These were simulated drops.

of proportion to the other requirements of the overall exercise. TAC pointed out also that because of unfavorable drop conditions, the RCT drops were simulated with troop-carrier aircraft flying empty and with troops being delivered to the DZ by truck.[28] The implication here is that the excessive simulations and the artificiality of the entire operation tended to reduce the seriousness of the Army criticism. Nevertheless, it appeared that the Army felt constrained to employ battalion-size increments in the administrative move to the DZ in order to conform to the size of the simulated air-drop. To have done otherwise and to have moved the regiments as units would have required a complete, last-minute, change of plans—plans that were drawn with the expectation that actual battalion-size drops would be made.

The final point in TAC's rebuttal was that the Army failed to make full use of the airlift that was available. During most of the exercise the Army did not provide the programmed number of heavy-drop loads and loads to be airlanded, and as a result, Air Force training requirements were not satisfied.[29]

Aeromedical Evacuation

The two services also disagreed over responsibility for aeromedical evacuation of casualties during the RCT exercises. The Air Force took the position that before the link-up of the paratroops with the ground units, it was responsible for all air evacuation of casualties. The Army contended that during this period the evacuation of actual casualties should be carried out "by the most available means [either Air Force or Army] in the interest of humanity."[30]

In this dispute the Air Force was on very solid ground. In the Memorandum of Understanding Relating To Army Organic Aviation, 4 November 1952,* the Secretaries of the Army and the Air Force agreed that in airborne operations it was an Air Force function to evacuate "all casualties from the objective area until such time as ground link-up is attained."[31] The provisions of this memorandum were seemingly applied to Exercises COLD SPOT and SNOW STORM, for on 2 January 1953 Tactical Air Command and the Office, Chief of Army Field Forces (OCAFF), agreed that "Tactical Air Command will provide airlift for the air movement of troops, supplies, and equipment in the assault and subsequent phases of the airborne RCT Exercises and the evacuation of all casualties from the objective area until such time as a ground link-up is attained."[32]

The Army, however, held that the movement of actual, as distinguished from simulated, casualties in these exercises did not come within the terms of these agreements. Exercise SNOW STORM directives required that during the RCT exercises air evacuation from the DZ would be controlled by the 82d Airborne Division surgeon and that air evacuation of actual casualties would be equally divided between the Air Force and the Army. These directives indicated further that the movement of actual casualties would not be part of the exercises but would be by administrative movements.[33]

At a conference between Air Force and Army representatives called to straighten out this dispute, the SNOW STORM exercise director was informed that until link-up of paratroops and ground forces all air evacuation must be under the control of the Air Force, which had the capability and the responsibility for carrying out this function. The Air Force agreed that actual casualties should be moved as expeditiously as possible and by the most suitable type of transportation. The Air Force did not deny that it was the 82d Airborne Division surgeon's prerogative to determine whether casualties were to be evacuated by air or by ground transportation. But once casualties were designated for air evacuation, the Air Force insisted, their movement became an Air Force responsibility.[34]

No agreement was reached at this conference, and the COLD SPOT air commander informed TAC's commander, General John K. Cannon, that the position taken by the SNOW STORM exercise director could not be reconciled with what appeared to be a firm TAC-OCAFF agreement. General Cannon personally contacted Chief, Army Field Forces, and on 3 March 1953 secured from him an

*This agreement was published in Army Special Regulations No. 95-400-5 and Air Force Letter No. 55-5; both are dated 19 November 1952.

agreement that when the division surgeon determined that air evacuation was the proper method, the Air Force would provide the means and do the job.[35] Thus, almost midway through the RCT phase, the Air Force position was finally vindicated.

Discussing this settlement in a letter to the Chief of Staff, USAF, General Cannon stated that after the agreement no actual casualties were evacuated from the objective area by air and that "apparently the Army preferred movement of casualties by ambulance over several miles of rough terrain in cold weather to air movement by available Air Force helicopters suitably equipped for the purpose."[36] The SNOW STORM final report showed that the Air Force evacuated two actual casualties on D-day (10 March) of the third RCT exercise, and the Eighteenth Air Force reported that helicopters of the 314th Troop Carrier Wing evacuated actual casualties during this exercise.[37]

These reports, of course, challenge the accuracy of General Cannon's statement about the number of casualties evacuated by the Air Force after the 3 March agreement. But that the general may have been correct in his statement that the Army avoided the use of Air Force evacuation facilities can be inferred from the disparity in the number of casualties evacuated by the two services during the third RCT exercise. According to the SNOW FALL report, only two actual and three simulated casualties were evacuated by the Air Force on D-day, when the Air Force was responsible for all air evacuation. After the ground link-up on D plus 1, when air evacuation became an Army responsibility, air evacuation activity increased sharply, and Army helicopters of the 53d Helicopter Ambulance Company evacuated 21 actual and 27 simulated casualties during a 25-hour period, a number far in excess of the Air Force figure.[38] Lending support to the belief that the Army tended to avoid the use of Air Force evacuation facilities is the comment by the 1st Aeromedical Evacuation Group that the Army was a "bit reluctant" to let the Air Force handle its simulated casualties and that simulated casualties brought from the DZ by Air Force helicopters consisted almost entirely of Air Force personnel.[39]

This controversy should not obscure the fact that the Air Force did benefit from the experience of conducting aeromedical evacuation operations in Exercise COLD SPOT. Eighteenth Air Force reported that the exercise provided an excellent opportunity to broaden the knowledge of air evacuation and medical field operations under cold-weather conditions, an opportunity that was shared by the men and officers brought to the exercise on temporary duty from all of the Eighteenth's medical bases. An important lesson learned by the Eighteenth was that there was ample airlift available within the troop-carrier force to fulfill all air evacuation responsibilities and that no additional aircraft were needed for this purpose.[40]

Aerial Port Operations

Aeromedical evacuation interservice friction continued despite the apparent settlement, and a similar situation existed with respect to the operation of aerial ports. Here, interservice differences were seemingly resolved shortly before Exercises COLD SPOT and SNOW STORM in an agreement reached by the Air Force and Army Chiefs of Staff on 23 December 1952 and published on 23 January 1953 as Memorandum of Understanding Relating to the Operation of Air Force Air Terminals.

Nevertheless, the Army and the Air Force differed over aerial port operations, a point at issue being the shortage of aircraft floor conveyors and tie-down equipment needed for heavy-drop operations. The memorandum of understanding assigned to the Air Force responsibility for furnishing floor conveyors and tie-down equipment used in the movement of Army units, but during part of the exercise the 1st Aerial Port Operations Squadron was unable to provide all that were required.

The Army version was that although 36 C-119's were committed to the exercise, the aerial port squadron arrived at Camp Drum with only five roller (floor) conveyors, a limited amount of tie-down equipment, and no materials handling equipment. Shortly after the squadron's arrival Commanding General, Eighteenth Air Force, requested that the 82d Airborne Division furnish the squadron with sufficient tie-down equipment and ejection kits to allow the squadron to discharge its responsibility for delivering Army equipment by the heavy-drop method. The request was officially refused, as far as Exercise SNOW STORM was concerned, "on the basis that split responsibility

would result" and because the furnishing of this equipment was an Air Force responsibility. However, in order to insure the execution of the RCT exercises, the 82d Airborne Division offered to provide the equipment on a loan basis, if division personnel accompanied the loads and directed preparations for the aerial ejection of each load. According to the Army, this offer was accepted by the Air Force. In conclusion, the Army account recommended that the 1st Aerial Port Operations Squadron and all similar squadrons be furnished sufficient organic equipment to enable them to carry out the terms of the memorandum of understanding.[41]

The Air Force reply, given in a letter from General Cannon to the Chief of Staff USAF, was that in the first place the Army's reference to the number of heavy-drop kits available as compared with the number of C-119's assigned to the exercise had no bearing on the subject, since the majority of the C-119's committed were to be used for personnel drops rather than heavy drops. In the second place, said General Cannon, 82d Airborne Division plans called for heavy drop of only 40 items during the period 9-21 February, a figure that would have required the use of only two to five aircraft per day and would not have exceeded the capabilities of the 1st Aerial Port Operations Squadron as far as roller conveyor and tie-down equipment was concerned.[42]

On 9 February, according to General Cannon, the Army and the Air Force changed these plans to permit simultaneous drops from six C-119's, making it necessary for the Air Force to secure additional equipment. The general stated further that since working agreements in effect for many months permitted joint use of Army aerial unloading equipment and Air Force tie-down equipment, the 82d Airborne Division was approached for the loan of additional equipment. General Cannon's version was that the Army refused to furnish this equipment unless Army men were permitted to eject the loads, an activity that according to the memorandum of understanding was an Air Force responsibility. In any event Air Force dependence on Army equipment was short-lived, for according to General Cannon's account, additional Air Force equipment was airlifted to the exercise area on 17 February, and all drops made after that date were with Air Force equipment exclusively.[43]

Eighteenth Air Force was able to submit in its report a number of findings and recommendations bearing on the operation of aerial ports. The Eighteenth found that materials handling equipment could not be readily carried in medium troop-carrier aircraft, that it could not traverse the 17-degree slope of the C-124 ramp, and that it was not particularly adaptable to the terrain features encountered in an airhead type of operation. The Eighteenth recommended that an air cargo handling development program be initiated and that commercial air cargo handling equipment be procured for use while the military characteristics of such equipment were being ascertained. It was apparent that the lack of efficient air cargo handling equipment made it necessary to employ a greater number of men in forward airheads. It was suggested that a light, air-transportable pallet be devised so that cargo coming into an airhead could be handled in bulk loads, thus speeding up the unloading of aircraft, reducing the time aircraft had to remain on the ground, and expediting the flow of supplies through the distribution system.[44]

A factor that hampered efficient aerial port operations was the use of different types of documentation by the various transportation systems handling cargo. Cargo might flow through the military air transport system, the military sea transport system, the commercial and military surface transportation systems, and the troop-carrier system before reaching its destination. This use of different types of documentation made tracing of lost, damaged, or stolen cargo extremely difficult. There was a definite need for a single method of documentation. A final recommendation directed attention to the need of bringing AF Manual 400-5 (logistics) up to date, particularly in regard to equipment lists and weights.[45]

Combat Control Teams

Interservice controversy in Exercises COLD SPOT and SNOW STORM extended also to Air Force combat control team activities. Before these exercises, and going back to World War II, the marking of DZ's and LZ's for incoming troop-carrier serials was performed by Army pathfinder teams that were dropped before the main assault. In the Joint Training Directive for Air-Ground Operations, 1 September 1950, and in the Standing Operating Procedures for Troop Carrier-Airborne

Operations, 16 February 1951, both of which were published jointly by TAC and OCAFF, the pathfinder responsibility was, in effect, transferred from the Army to the Air Force.[46]

For about a year and a half after these agreements the Air Force was reluctant to assume the pathfinder responsibility. Evidently, the reason for the delay was the hope or expectation that electronic navigational aids could be developed that would make it unnecessary to drop pathfinder teams before the main airborne assault. Finally, in the latter part of 1952, after it had become quite obvious that electronic aids could not in the near future replace personnel, the Air Force began the training of pathfinder teams. The assumption by the Air Force of full responsibility for pathfinder functions was expected to take place in January 1953.[47]

These Air Force pathfinder teams were called combat control teams since their duties were broader than those of the Army pathfinder teams which they were to supplant. The combat control team was expected to perform such additional tasks as establishing ground-to-air communication on the DZ or forward airfield, relaying to incoming troop-carrier serials information and advice on conditions on the DZ or forward airfield that might affect the accomplishment of the mission, establishing point-to-point communication to rear command posts, assisting in the selection and marking of landing zones for assault aircraft, and exercising air traffic control of the initial assault echelons within the airhead.[48]

Exercise COLD SPOT marked the first use of a combat control team in a training exercise.* One such team was assigned to the exercise, and according to the COLD SPOT final report it accomplished its prescribed mission. The team was employed in all the RCT exercises as well as in the individual jumps in the Snow Ridge area. Nine members of the team completed jump training and Army pathfinder training at Army installations, and if ground conditions had permitted the jumping of troops during the RCT exercises, the team would have parachuted into the DZ. Instead, movement of the teams to the DZ's was carried out by helicopters and ground vehicles.[49]

The Army took a far less sanguine view of the combat control team's capabilities. In a memorandum to Chief of Staff, USAF, the Army's deputy chief of staff for operations and administration, Lt. Gen. A.C. McAuliffe, after first claiming that the TAC commander had "arbitrarily announced assumption of responsibility for pathfinder operations effective 1 January 1953," launched into a detailed criticism of the combat control team performance in COLD SPOT-SNOW STORM. The points stressed by General McAuliffe were 1) that Eighteenth Air Force furnished only one combat control team, consisting of nine enlisted men, only one of whom was a trained pathfinder; 2) that in the battalion drop of 10 February the combat control team did not jump but was moved to the DZ administratively, by helicopter; 3) that inadequate equipment and shortage of trained personnel prevented the combat control team from operating more than one DZ at a time during daylight hours; and 4) that the teams were unable to operate at night. General McAuliffe also stated that the control team's equipment was borrowed from the 11th Airborne Division.[50]

In reply to these criticisms General Cannon stated that the failure of the Air Force to satisfy fully the Army's needs was the result of the Army's failure to predict and plan properly for these needs. In answer to the specific points raised by General McAuliffe, General Cannon stated that 1) since advance planning with Army units indicated that only one landing area would be used for personnel and equipment drops and for an assault-landing strip, one combat control team, consisting of one officer and nine airmen, was trained and made available for the exercises;† 2) that in the battalion drop of 10 February the combat control team was moved to the DZ by helicopter in order to test the feasibility of this means of deployment for possible use in subsequent phases of the exercise and in combat; 3) that by dividing the combat control team, two DZ's (Munsan and Snow Ridge) were operated

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*Army Air Forces combat control teams were used late in World War II in Operation VARSITY, the airborne assault carried out in conjunction with the British Second Army's crossing of the Rhine River in March 1945. These teams did not perform the pathfinder function of marking DZ's but were flown to the DZ's by glider for the purpose of sending information regarding the weather and the battle situation to incoming aircraft and to home bases. They were also prepared to control air traffic on the DZ's. See USAFHS-97, Airborne Operations in World War II, European Theater, pp. 164, 191.

†General McAuliffe's claim that control team personnel were untrained is also contradicted in the COLD SPOT final report.

simultaneously; and 4) that the control team was capable of operating one DZ at night, and did so for equipment drops, but the Army declined to perform night personnel drops. General Cannon's reply made no reference, however, to the statement that the control team operated with equipment borrowed from the Army.[51]

The TAC commander also took exception to the claim that he had arbitrarily announced assumption of responsibility for pathfinder operations. According to General Cannon, TAC had stated as early as 29 September 1952 that it recognized the Air Force's responsibility for performing the pathfinder function and that it expected that by January 1953 Eighteenth Air Force would have a pathfinder capability and that the Air Force could then assume its responsibility.[52]

Communications

Air Force communications were somewhat more effective in COLD SPOT than they had been in previous exercises. Point-to-point telephone and teletype communication between the various exercise bases—Griffiss, Burlington, Wheeler-Sack Army Air Field, and SNOW STORM headquarters at Camp Drum—were adequate. The two VHF FM radio relay systems used between Griffiss and Wheeler-Sack were less satisfactory. Interference between the two systems resulted in cross-talk, an increased noise level, and in some cases complete system blocking. Although improvement was noted after one system of antennas was changed to vertical polarization, the best solution to interference appeared to be the modification of the systems' AN/TRC-8, 11, and 12 radio sets for crystal-controlled frequencies and the publication of charts indicating the frequencies to avoid when more than two transmitters and receivers are used in close proximity.[53]

There were also communication and control difficulties in the tactical air control system. Only a skeleton system was employed, and the TACC and TADC were omitted entirely. The small size of the exercise perhaps did not justify the expense of providing both of these facilities, but the use of a TADC did seem warranted. Even in a small maneuver a TADC is needed to control aircraft operating in the exercise area, to alleviate problems that arise in connection with clearances and instrument flights, and to furnish the air commander with an up-to-the-minute picture of the status of his aircraft while they are in flight. All of these matters would have gone more smoothly in COLD SPOT if a TADC had been provided, and the participants would have gained valuable experience in the operation of a more realistic tactical air control system.[54]

The only components of the tactical air control system that were furnished were a TADP and some TACP's. Interest in the TADP centered around the performance of its AN/MSQ-1 ground radar set, which was used to control fighter-bomber strikes. Results were generally unsatisfactory. On several missions pilots and radar controllers reported excellent results. But there were a number of deficiencies: set alignment and power supply difficulties were encountered: ground-to-air communications were largely unsatisfactory; and skin tracking of flights of F-51's engaged in ground-controlled bombing was mostly unsuccessful. Attempts were made to control C-119's equipped with AN/APW-11 airborne radar control beacons, but the results were poor.[55]

Communications between fighter-bomber aircraft and the TACP's, according to the COLD SPOT final report, were generally unsatisfactory, a condition that was attributed primarily to old equipment and the type of antenna used by the F-51's.[56] The TACP's AN/VRC-1 radios, frequently a target for criticism in past exercises, performed fairly well. The 941st Forward Air Control Squadron had trouble with both the VHF and HF components of this set. The operation of the HF component was hampered by the formation of ice on its antenna. No major difficulty was encountered in controlling fighter strikes by VHF radio since the AN/TRC-7 was available for alternative use when the AN/VRC-1's VHF component failed. The 941st Squadron felt that considering the equipment's age and extensive use it had worked well. An excellent job had been done by the radio repairmen, and there had been sufficient time between missions for maintenance.[57]

Communication problems also appeared in connection with combat control team operations. The experience of the exercise indicated that combat control team communications equipment would have to be improved if the teams were to achieve flexibility in carrying out their various functions.

Especially pressing was the need for developing electronic aids for use by control teams and pathfinder aircraft.[58]

Cold-Weather Training

One of the chief purposes of Exercises COLD SPOT and SNOW STORM was to provide cold-weather training. In this regard the two services came up with opposing evaluations on the value of the exercises. The Army reported that at Camp Drum there had not been sufficient cold and deep snow cover to provide the desired training.[59] The Air Force, on the other hand, found that the training received by units and individuals in cold-weather operations, cold-weather maintenance, and cold-weather housekeeping was of great benefit and well worth the efforts and funds expended. Especially valuable was the experience gained in the following areas: acclimatization for personnel required to work out of doors, cold-weather survival training in the field, removal of ice and snow from aircraft, maintenance in severe cold, operation of aircraft on snow and ice-covered runways and taxiways, flying with bulky winter dress and equipment, navigation over snow-covered terrain, helicopter airlift to snowbound communications relay sites, pole climbing under snow and ice conditions, and vehicle operation in snow and on icy roads.[60]

The outstanding feature of the cold-weather survival training was Operation SURVIVAL, held on 27-28 February. Pilots of the 366th Fighter-Bomber Wing were transported by bus to a hilly area near Turin, New York, where they remained overnight. Tests were conducted to determine the pilots' ability to survive with only their normal flying clothes, A-1 Survival Kit, and C-1 Vest. The COLD SPOT final report concluded that this training was "extremely desirable" and that it should be part of the regular training of all aircrews.[61]

CHAPTER IX

EXERCISE TACAIR 54-7—PLANS AND OPERATIONS

Exercise Objectives

The highlight of Tactical Air Command's fiscal year 1954 training program (TACAIR 54) was Exercise TACAIR 54-7, a large-scale exercise held in the North and South Carolina area in April and May 1954. The aims of the exercise were 1) to achieve the maximum amount of training for Air Force units in troop-carrier and tactical air operations, defense against air attack, alternate means of communication, electronic countermeasures, and survival; 2) to increase the effectiveness of intelligence activities; and 3) to seek improvements and refinements in procedures, doctrine, tactics, and equipment.[1]

An additional purpose of TACAIR 54-7 was to provide training for Army units. Like Exercise COLD SPOT, TACAIR 54-7 was a unilateral rather than a joint exercise. In COLD SPOT, it will be recalled, joint operations were carried out in conjunction with Army Exercise SNOW STORM. A similar arrangement obtained for TACAIR 54-7; training for Army units was provided by conducting joint operations in conjunction with Army Exercise FLASH BURN, the Army's first large-scale atomic defense maneuver, which was held concurrently with TACAIR 54-7, in the Fort Bragg, North Carolina, area.

Planning

Planning for Exercise TACAIR 54-7 got underway shortly after Tactical Air Command (TAC) issued its Operations Plan 54-7, 16 November 1953 and its Operations Plan TACAIR 54, 1 December 1953, the latter governing all TACAIR operations for fiscal year 1954. These plans assigned to Eighteenth Air Force overall responsibility for the exercise and outlined the tasks of the major participants, Eighteenth and Ninth Air Forces. The Eighteenth's commander was instructed to designate the exercise commander, and the commanders of the Eighteenth and Ninth were directed to provide a staff to assist the exercise commander in the planning and conduct of operations.[2]

Maj. Gen. Robert W. Douglass, Jr., Commander, Eighteenth Air Force, was named commander for TACAIR 54-7. A planning headquarters (Headquarters, TACAIR 54-7) was activated at Donaldson AFB, South Carolina, on 1 February 1954 and given the mission of planning exercise operations scheduled to take place during the period 26 April-4 May 1954. On 10 February this headquarters issued TACAIR 54-7 Operation Plan 1-54, which set forth general procedures for the participating units. Several conferences were conducted during February with the 1800th Airways and Air Communications Service (AACS) Wing, 1803d AACS Group, Ninth and Eighteenth Air Forces, and the 2d Regional Civil Aeronautics Administration (CAA) Office, Fort Worth, Texas. At these meetings requirements for AACS, CAA personnel, and maneuver danger areas were submitted and approved.[3]

To conduct the operational phase of the exercise, Headquarters, TACAIR 54-7 established on 20 April an advance headquarters at Pope AFB, North Carolina. This move facilitated final planning since Ninth Air Force headquarters and Eighteenth Air Force advance headquarters were both located at Pope and the headquarters for Army Exercise FLASH BURN was situated at nearby Fort Bragg. To achieve mobility and to save space and equipment, the TACAIR 54-7 advance headquarters was set up inside a C-124 aircraft.[4]

In the meantime the Ninth and Eighteenth Air Forces proceded with their preparations for the exercise. Many of the important details were worked out in planning conferences held in January 1954. At a conference held at Pope AFB on 7 January representatives of Ninth and Eighteenth Air Forces met with General Douglass to discuss matters pertaining to airspace reservation and the restricted

area for the exercise, the number of forward air controllers to be furnished to Army units, and the airlift of Air Force units to their exercise bases. As a result of this conference and a meeting held shortly thereafter at Exercise FLASH BURN headquarters, it was determined that Shaw, North, and Langley airfields would be used for the tactical air force (Ninth Air Force units) and Laurinburg-Maxton, Charleston, and Pope for the troop-carrier force (Eighteenth Air Force units).[5]

On 25 January Ninth Air Force staff officers visited Eighteenth Air Force headquarters at Donaldson AFB to conduct a briefing for General Douglass and his staff on the Ninth's operations plan for TACAIR 54-7. At this time also Seymour-Johnson Airfield was substituted for Laurinburg-Maxton Airport as a troop-carrier base, and paragraph 3B of TACAIR 54-7 operation plan, the paragraph that set forth Ninth Air Force tasks for the exercise, was written and approved. It was decided further that the Ninth would develop the exercise intelligence plan, which would be monitored by TACAIR 54-7 headquarters and disseminated to Eighteenth Air Force units, and that the Eighteenth would provide a troop-carrier liaison officer to work in the JOC throughout the exercise.[6]

The tasks and responsibilities of all Eighteenth Air Force units slated to take part in TACAIR 54-7 were outlined in the Eighteenth's Operation Plan 60-54, which was published on 26 March 1954. On the same day Ninth Air Force issued its Operation Plan 9-54; however, a number of changes had to be made, and the plan was published in revised form on 10 April.[7]

Since TACAIR 54-7 and FLASH BURN were unilateral exercises, there was no joint planning headquarters or joint maneuver headquarters. Joint planning was carried out by liaison between the two exercise headquarters and by joint planning conferences. On 15 December 1953 the FLASH BURN maneuver director in a conference with representatives of Ninth Air Force agreed that plans were to be made for the manning and operation of the JOC, which was to be located at Pope AFB. In a visit by General Douglass and Ninth Air Force staff officers to FLASH BURN headquarters early in January 1954, General Douglass discussed the departure airfields to be used by troop-carrier aircraft during FLASH BURN airborne operations. He also indicated that the 37th Infantry Division at Camp Polk, Louisiana, would be airlifted from Alexandria AFB, Louisiana, to the maneuver area: a regimental combat team would be airlifted to Pope AFB on 20 April, and the remainder of the division would be airlanded at Camp Mackall Airfield on 29-30 April.[8]

Detailed planning for airborne operations was carried on by direct liaison between Eighteenth Air Force and the Army's XVIII Airborne Corps and 82d Airborne Division. Final plans were drawn up on 30 March at a conference between the maneuver director of Exercise FLASH BURN and representatives of these organizations. Many of the details of joint operations to be conducted by Ninth Air Force and XVIII Airborne Corps were worked out a few days before the beginning of the exercise after the corps air liaison officer arrived at corps headquarters with a copy of the Ninth's Operation Plan 9-54.[9]

Organization and Command Structure

As far as joint operations were concerned Exercises TACAIR 54-7 and FLASH BURN were set up as components of a theater of operations.* TAC and OCAFF, together, stood in the place of the theater commander, and the commanders of TACAIR 54-7 and FLASH BURN acted respectively as the theater air and theater ground commanders. Under the theater air commander (Commander, TACAIR 54-7), Eighteenth Air Force (Adv) operated as a numbered troop-carrier air force and Ninth Air Force functioned as a numbered tactical air force. Joint operations conducted by Ninth Air Force and Third Field Army, the major component of the theater ground force (Exercise FLASH BURN) were coordinated in a JOC at Pope AFB.[10]

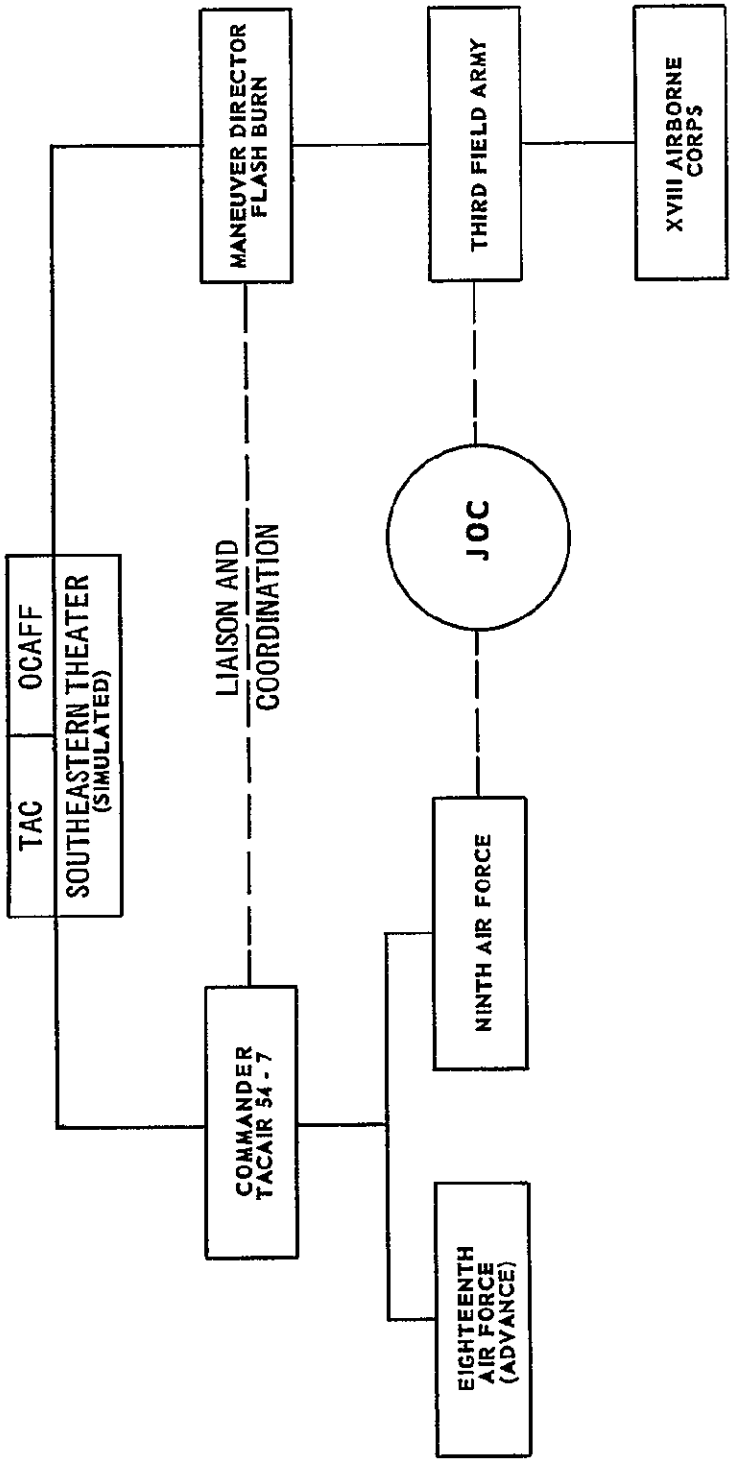
As has been indicated, TACAIR 54-7 was commanded by General Douglass. In command of Eighteenth Air Force (Adv) was Brig. Gen. E.H. Alexander, Chief of Staff, Eighteenth Air Force. Ninth

*See Chart 5. The theater organization outlined here does not appear in so many words either in the exercise plans or in the final reports. But there is sufficient evidence to indicate that a theater organization was employed— particularly for the atomic weapons play. See Disposition Form, NAFOT-BDS to NAFOT-FOD, subj: Comments on Paragraph 1b (1) Employment of Atomic Weapons, 9 June 54, in Hist 9th AF, 1 Jan-30 Jun 54, Vol III, doc 167[4].

CHART 5

ORGANIZATION

Exercises TACAIR 54-7 and FLASH BURN



Air Force operated under its commander, Maj. Gen. E.J. Timberlake.[11] The FLASH BURN maneuver director was Third Army commander, Lt. Gen. A.R. Bolling. General Bolling also acted as commander of Third Field Army, which was Third Army's field headquarters for FLASH BURN. The XVIII Airborne Corps was commanded by Maj. Gen. Joseph P. Cleland.[12]

Participating Units

Eighteenth Air Force troop-carrier units assigned to TACAIR 54-7 included the 63d Troop Carrier Wing, augmented by the 61st Troop Carrier Group; the 314th Troop Carrier Wing, including its attached assault squadrons, the 16th Troop Carrier Squadron, Assault (L), and the 644th Troop Carrier Squadron, Assault, Rotary Wing; the 456th Troop Carrier Wing, augmented by the 463d Troop Carrier Group; and the 464th Troop Carrier Wing, augmented by the 64th Troop Carrier Group.* Other important Eighteenth Air Force units were the 1st, 2d, 3d, 4th, and 5th Aerial Port Operations Squadrons, the 1st Aeromedical Group, and the 4418th Communications Group.[13]

Operating under Ninth Air Force were the 21st and 405th Fighter-Bomber Wings, the 363d Tactical Reconnaissance Wing, the 69th Pilotless Bomber Squadron, the 507th Tactical Control Group, and the 8th Communications Group. Serving as Aggressor air was a detachment from the 366th Fighter-Bomber Wing, consisting of the 391st Fighter-Bomber Squadron, with a small detachment from the 612th Fighter-Bomber Squadron attached.†[14]

The principal Army units assigned to FLASH BURN were Third Field Army and XVIII Airborne Corps, the latter composed of the 82d Airborne Division and the 37th Infantry Division. Acting as the Aggressor ground force were the 278th RCT (less one battalion combat team) and the 3d Cavalry Regiment.[15]

Exercise Bases

The exercise bases for the troop-carrier units were Donaldson AFB, South Carolina (63d Wing), Pope AFB (314th Wing), Charleston AFB, South Carolina (456th Wing), and Seymour-Johnson Airfield, North Carolina (464th Wing). The 21st Fighter-Bomber Wing operated from North Auxiliary Airfield, South Carolina, the 405th Fighter-Bomber Wing from Langley AFB, Virginia, the 69th Pilotless Bomber Squadron from Pope AFB, and the 366th Fighter-Bomber Wing detachment (Aggressor air) and 363d Tactical Reconnaissance Wing from Shaw AFB, South Carolina.[16]

Most of the troop-carrier units deployed to their exercise bases during the week of 18 April. The 464th Wing, however, moved earlier and was in place at Seymour-Johnson Airfield on 10 April. The outstanding feature of the deployment of Ninth Air Force units was the airlift of 21st Fighter-Bomber Wing equipment and personnel from George AFB, California, to North Auxiliary Airfield. This move, which involved the airlift of 336,000 pounds of cargo and 696 airmen, was completed on 17 April by C-124's of the 62d Troop Carrier Wing. Known by the code name BOX KITE, this operation served the dual purpose of positioning the 21st Wing for TACAIR 54-7 and testing the 21st's mobility plan. The 366th Fighter-Bomber Wing's 391st Squadron (Aggressor air) was airlifted from Alexandria AFB, Louisiana, to Shaw AFB, arriving on 23 April. For the 405th Fighter-Bomber Wing and the 363d Tactical Reconnaissance Wing no move was necessary since both operated from their home stations.[17]

Eighteenth Air Force also had a hand in the Army's deployment for Exercise FLASH BURN. During the period 21-23 April C-124's of the 63d Troop Carrier Wing airlifted the 37th Infantry Division's 145th RCT from Alexandria AFB, near the 37th Division's home station, Camp Polk, to Pope AFB.††[18]

*The 314th, 456th, and 464th Troop Carrier Wings and their attached groups were medium troop-carrier units equipped with C-119 aircraft. The 63d Troop Carrier Wing and its attached group were heavy troop-carrier units equipped with C-124's. The 16th Troop Carrier Squadron, Assault (L), was equipped with C-122's, and the 644th Troop Carrier Squadron, Assault, Rotary Wing, employed H-19 helicopters.

†Except for the 405th Fighter-Bomber Wing all fighter-bomber units were equipped with F-86F aircraft. The 405th furnished one squadron of F-84 G's (511th Fighter-Bomber Squadron) and one squadron of B-26's from the 4400th Tactical Bombardment Group (Tng). The 363d Tactical Reconnaissance Wing was equipped with RF-80's and RB-26's.

††Later, after FLASH BURN had begun, the 63d Wing lifted most of the balance of the 37th Division from Alexandria to Camp Mackall, near Fort Bragg. See below, pp. 100, 103.

Pre-Exercise Training

Pre-exercise training for Eighteenth Air Force units began late in 1953 when token forces from each medium troop-carrier wing took part in a simulated assault on Camp Mackall Airfield, North Carolina, using Shaw, Charleston, and Donaldson Air Force Bases as departure airfields. The second training mission was a regimental combat team drop on the Fort Bragg DZ's followed by a corridor resupply operation between Pope AFB and Mackall Airfield. The latter mission was designed particularly to train newly activated aerial port operations squadrons and to aid in the determination of planning factors for the handling of traffic between Pope and Mackall during the actual exercise.[19]

A paradrop of the 82d Airborne Division was conducted on 11 March in a joint rehearsal for FLASH BURN-TACAIR 54-7. Because the exercise DZ's in the Camp Mackall area had not yet been finally selected, all drops were made on the Fort Bragg DZ's. On the following day the paratroops of Headquarters, XVIII Airborne Corps were dropped on Mackall Airfield, and on 13 April a small-scale rehearsal, involving only token airborne forces, was conducted using the actual exercise DZ's. This rehearsal provided training for lead crews and furnished a test of communications, aeromedical evacuation procedures, and the operation of the transport movement control center and combat airlift support units. Several field training exercises were conducted at Seymour-Johnson Airfield during March and April to provide heavy-drop training for aerial port operations squadrons. During the week preceding the beginning of the exercise (26 April) troop-carrier units engaged in numerous corridor orientation flights, DZ familiarization flights, and formation flying exercises.[20]

No formal pre-exercise training phase was scheduled for Ninth Air Force fighter-bomber units. However, from 17 to 25 April the 21st Fighter-Bomber Wing carried out counterair and interdiction missions, which served as familiarization flights. During the last three days of this period the 405th Fighter-Bomber Wing's 511th Squadron also took part in this training. The JOC was established at Pope AFB during the period 17-25 April. Reporting and communication procedures were established, and all fighter-bomber flights checked in and out with the JOC.[21]

In the several weeks before the exercise began the 363d Tactical Reconnaissance Wing prepared target materials to be used for the counterair and interdiction programs. Included in these materials were photographs of 27 Aggressor airfields in the Carolinas and in Georgia and Florida. All together, 135 domestic target folders were produced by the 363d Wing's 363d Reconnaissance Technical Squadron, and all of the information was in the hands of the fighter-bomber units by the time the exercise began or shortly thereafter.[22]

For Eighteenth Air Force the 363d Wing photographed all DZ's in the Camp Mackall area. By 20 February this task had been completed and all film had been processed. From these films the Eighteenth Air Force photo intelligence section constructed three strip mosaics of each of the five DZ's. Each mosaic consisted of 20 individual photos showing ten-mile approaches on both ends of the DZ's. In all, approximately 8,700 photos were disseminated to Eighteenth Air Force participants.[23]

Play of Exercises TACAIR 54-7 and FLASH BURN

According to the intelligence situation governing Exercises TACAIR 54-7 and FLASH BURN, it was assumed that early in 1951 an Aggressor nation, having defeated the North Atlantic Treaty Organization forces and the United States forces overseas, launched an amphibious attack that established Aggressor forces in Florida and along the east coast of the United States as far north as Morehead City, North Carolina. In late 1951 the Aggressor withdrew his forces to the south, retaining Florida and a beachhead extending from Georgetown, South Carolina, to Morehead City. Late in 1953 the Aggressor began an offensive to the north from occupied Florida but was stopped along a line running generally through central Georgia and Alabama. However, the Aggressor retained the initiative, and on 27 March 1954—A-day minus 30 for FLASH BURN-TACAIR 54-7—he again attacked to the north in an effort to break out of the Georgetown-Morehead City beachhead. By 16 April (A minus 10) the Aggressor had established a deep salient in the Camp Mackall area of North Carolina, driving west across the Pee Dee River near Rockingham, north to Asheboro, and east to the western boundary of Fort Bragg.[24]

The task of the U.S. ground forces engaged in Exercise FLASH BURN was to reduce this salient, and the job was to be carried out mainly by Third Field Army, composed of XVIII Airborne Corps and VIII Corps (simulated). Operations were divided into three phases. The first phase (23-26 April) consisted of a regimental combat team retrograde movement west of Fort Bragg, a movement that was intended to delay Aggressor forces attacking east in the direction of vital U.S. supply installations at Bragg. The second phase (26 April-2 May) involved the drop of an airborne division of XVIII Airborne Corps behind Aggressor lines in the Camp Mackall area and the seizure of an airhead at Mackall, the reinforcement of this division by the airlanding of an infantry division in the airhead, and a link-up with the airhead by an armored force from VIII Corps attacking west from Fort Bragg. In Phase III (2-5 May) U.S. forces attacked to the southwest in an effort to break out of the airhead.[25]

The Phase I delaying action was fought by the 37th Infantry Division's 145th RCT, which had been airlifted from Alexandria AFB to Pope AFB near Fort Bragg, just before the exercise began.* Phase II began on 26 April with atomic attacks on Aggressor forces near Mackall Airfield and in the vicinity of Hamlet and Seagrove, North Carolina. These attacks were followed by the airdrop of the 82d Airborne Division on five DZ's situated in the Camp Mackall area. This drop began at 1000 on 26 April and was completed at 1615 on the following day. The reinforcement of the airborne troops in the airhead began on 29 April with the airlanding of elements of the 37th Infantry Division, which were airlifted from Alexandria AFB to Mackall Airfield by the 63d Troop Carrier Wing. This move was to have been completed on 1 May, but because of bad weather it continued until 4 May.[26]

The armored force link-up with the airhead forces was carried out by VIII Corps' Task Force Martin, which was made up of the 145th RCT, reinforced by the organic tank battalions of the 82d Airborne Division and the 37th Infantry Division. Task Force Martin attacked to the west from Fort Bragg on 30 April and linked up with the airhead forces on 2 May, thus concluding Phase II.[27]

During the period 2-4 May XVIII Airborne Corps redistributed its forces and executed limited objective attacks in preparation for the breakout from the airhead. At 0700 on 5 May corps units and other elements (simulated) of Third Field Army launched the breakout attack. At 0800, shortly after they had crossed the line of departure, the exercise was terminated.[28]

Air Force Operations—Reconnaissance

During the play of Exercise FLASH BURN, TACAIR 54-7 units concentrated on reconnaissance, fighter-bomber, light bombardment, pilotless bomber, and troop-carrier operations. For FLASH BURN forces the 363d Tactical Reconnaissance Wing flew 83 photo reconnaissance sorties and 117 visual reconnaissance sorties. Included in these totals were 11 night photo sorties and 4 night visual sorties. To assist Ninth Air Force air superiority and interdiction operations, the wing flew 57 photo reconnaissance sorties and 38 visual reconnaissance sorties. Six of the photo sorties and seven of the visual sorties were flown at night. Photographs for frontline cover were taken at a scale of 1:10,000. Special cover for the Army varied from very large-scale photographs taken in low-level diving runs to vertical cover taken at a scale of 1:8,500. Photographs for the Air Force were taken at scales ranging from 1:5,000 to 1:10,000.[29]

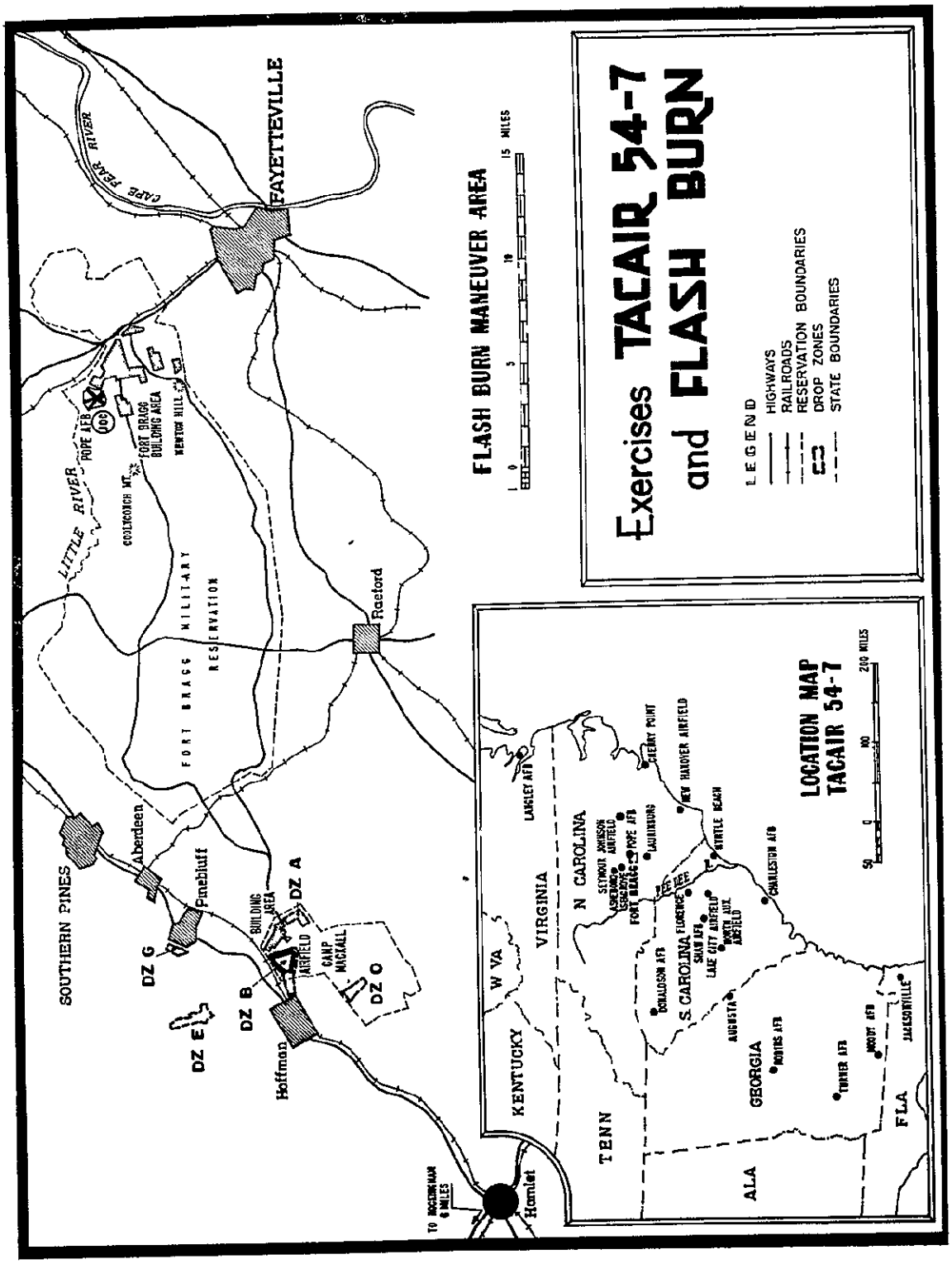
An important feature of reconnaissance operations was the establishment of a joint air photo center at Shaw AFB. The Air Force portion of the center was manned by the 363d Reconnaissance Technical Squadron, and the Army component was made up of the 67th Engineer Aerial Photo Reproduction Company and a photo interpretation detachment.[30]

Fighter-Bomber Operations

U.S. forces fighter-bomber units flew a total of 1,268 sorties during TACAIR 54-7. Out of this total 1,253 were flown by the 21st Fighter-Bomber Wing, and the remaining 15 were flown by the 405th Fighter-Bomber Wing. The 21st Wing's total was made up of 563 counterair, 268 interdiction, and 422 close-support sorties. The counterair sorties were carried out during actual gunnery missions flown

*See above, p. 98.

MAP 5



on the air-to-air and air-to-ground ranges in the exercise area. Interdiction missions were conducted against targets selected from the targeting system with priorities established by means of intelligence information. Close-support missions, both preplanned and immediate, were flown for the Army during the ground action that followed the drop of the 82d Airborne Division.[31] Close-support requests were forwarded to the JOC through Army channels and strikes were controlled by the facilities of the tactical air control system.

Acting as Aggressor air, the 391st Fighter-Bomber Squadron flew a total of 137 sorties in direct support of the Aggressor ground forces. Aggressor requests for air support were forwarded to the JOC through the chief umpire at FLASH BURN headquarters and through the umpire stationed at the JOC. Preplanned requests were set forth in operation orders. Immediate missions were scrambled by the JOC, using aircraft maintained on alert by the 391st Squadron. Close-in control was exercised by forward air controllers attached to the Aggressor forces.[32]

Light Bombardment Operations

Light bombardment operations were conducted against interdiction, close-support, and armed reconnaissance targets in the Aggressor's beachhead area. These were night intruder missions flown from Langley AFB by B-26's of the 405th Fighter-Bomber Wing's 4400th Tactical Bombardment Group (Tng). The B-26's, with individual target assignments, began leaving Langley shortly after six p.m. each evening and made single plane takeoffs until midnight. Normally, the night intruders were sent against preplanned targets, using Shoran and AN/MSQ-1 radar for guidance. After hitting their targets the B-26's performed visual armed reconnaissance in order to expend their remaining ordnance. The 4400th Group flew a total of 111 interdiction sorties and 2 close-support sorties.[33]

Pilotless Bomber Operations

A significant innovation in TACAIR 54-7 was the use of the B-61 Matador pilotless bomber. Pilotless bomber operations were carried out by the 69th Pilotless Bomber Squadron, which furnished one B-61, a target computation team, and a launch flight, with sufficient equipment to perform simulated launchings. The B-61 and the launch flight were based at Pope AFB, and the computation team was located in the JOC area at Pope. Computations were made for 14 targets, 6 of which were attacked in simulated B-61 strikes. To simulate the delivery of the B-61, the launch flight assembled the missile, actually started its engine, and then triggered a smoke device to simulate the release of the weapon. Simultaneously with the firing of the smoke device, an F-86 flew low over the launching area to simulate the takeoff of the B-61. The F-86 was then taken under control by AN/MSQ-1 radar and directed to the target.[34]

To provide training in the air and ground transportation of the B-61, the weapon was airlifted to Pope from the 69th Squadron's home station Patrick AFB, Florida, and the launch flight and computation team moved by motor convoy. After pilotless bomber operations were completed, the launch flight returned to Patrick by motor convoy, moving the B-61 on its launching trailer.[35]

Troop-Carrier Operations

Included in Exercise TACAIR 54-7 were all aspects of troop-carrier operations. Virtually all troop-carrier activity was closely related to Army operations in Exercise FLASH BURN. Troop-carrier operations consisted of the assault paradrop of an airborne division, the establishment of an independent corps-size airhead and a single forward cargo airfield, and the airlanding of an infantry division (less one RCT) in the airhead.[36]

The drop of the 82d Airborne Division began at 0930 on A-day (26 April) and was completed at 1615 on A plus 1. Five DZ's were used, all of them in the Camp Mackall area.* The 314th Troop

*See Map 5.

Carrier Wing dropped the 325th Airborne RCT on DZ's A, B, and O; the 456th Troop Carrier Wing dropped the 505th Airborne RCT on DZ's B, E, and G; and the 464th Troop Carrier Wing dropped the 504th Airborne RCT on DZ's A, B, and O.* The 314th Wing also dropped the 82d Airborne Division command group and division headquarters and artillery units on DZ B and an advance party of XVIII Airborne Corps on DZ A.[37]

Airlanding Operations

One of the chief purposes of the airborne assault was to seize a forward airfield that could be used to airland the forces needed to build up an airhead in the Camp Mackall area. By 1130 on A plus 1 the paratroops had secured Mackall Airfield, and a half-hour later airlanding operations began with C-122's attached to the 63d Troop Carrier Wing assault-landing some of the personnel and equipment needed to operate the airfield. Later in the day 63d Wing C-124's airlanded the 540th Field Artillery Battalion, the USAF Tactical Medical Center, and the 1st Aerial Port Operations Squadron. Late in the afternoon of A plus 1, C-119's of the 314th, 456th, and 464th Wings began airlanding personnel and equipment of XVIII Airborne Corps and the 82d Airborne Division. This movement continued until A plus 4, with the 314th Wing furnishing most of the lift. This was a corridor type of operation, and except during periods of bad weather the C-119's landed at Mackall at five-minute intervals and around the clock.[38]

At 0800 on A plus 3 (29 April) Mackall Airfield began receiving personnel and equipment of two RCT's of the 37th Infantry Division, which were lifted from Alexandria AFB, Louisiana, by C-124's of the 63d Troop Carrier Wing.† This operation continued until A plus 8 (4 May). At this time those elements of the 37th Division still remaining at Alexandria were lifted to Smoky Hill AFB, Kansas, near Fort Riley, which was to be the new permanent station of the division.††[39]

Supply and Resupply

Throughout the exercise a considerable part of the Air Force effort was devoted to supply and resupply operations. On A-day and A plus 1 extensive heavy-drop supply operations were conducted by the C-119's of the 314th, 456th, and 464th Troop Carrier Wings, using DZ's A, B, and O.††† On A plus 1 C-124's of the 61st Troop Carrier Group, which was attached to the 63d Troop Carrier Wing, dropped supplies on DZ A. The resupply of the 82d Airborne Division was accomplished chiefly by the 464th Troop Carrier Wing, which airlanded supplies and equipment at Mackall Airfield on A plus 3 and A plus 4. Earlier, on A plus 1 and A plus 2, the 464th Wing had flown heavy-drop resupply missions to DZ A, and later, on A plus 6, the wing flew an emergency heavy-drop resupply mission, dropping on Mackall Airfield.[40]

During the exercise phase Eighteenth Air Force troop-carrier units flew a total of 1,453 sorties: 1,131 of these were flown by C-119's, 292 by C-124's, and 30 by C-122's. Troop-carrier aircraft dropped 7,049 paratroops and 944 tons of supplies and equipment and airlanded 8,905 personnel and 8,380.5 tons of supplies and equipment.[41]

Transport Movement Control System

Centralized control and coordination of all troop-carrier activity was exercised by a transport movement control division, commonly called transport movement control (TMC), at Donaldson AFB. At

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*Troop-carrier units were marshaled and airborne units were loaded at the following airfields:

314th Troop Carrier Wing and 325th Airborne RCT	Pope AFB
456th Troop Carrier Wing and 505th Airborne RCT	Charleston AFB
464th Troop Carrier Wing and 504th Airborne RCT	Seymour-Johnson Airfield

†Before the exercise began, the 63d Wing had lifted one RCT of the 37th Division to Pope AFB.

††Earlier, the division was stationed at Camp Polk, Louisiana.

†††DZ's E and G were used for personnel drops only.

each Eighteenth Air Force maneuver airfield a combat airlift support unit (CALSU) was established to control and expedite movement of personnel and equipment by troop-carrier aircraft. At nonoperational bases such as Seymour-Johnson and Mackall Airfields the CALSU's were also responsible for running base operations and for providing crash and fire fighting facilities and messing facilities. The operating section of each CALSU was the movement control center (MCC), which was composed of a tactical operations section, an aerial port operations section, a communications section, an aeromedical section, and a liaison section from the unit being supported. The MCC's were linked to the TMC at Donaldson by a tactical communication net.[42]

Aerial Port Operations

The task of providing air terminal facilities and loading, lashing, ejecting, and unloading supplies and equipment carried by troop-carrier aircraft was performed by aerial port operations squadrons working under the CALSU's at the various maneuver airfields. The 1st, 2d, 3d, 4th, and 5th Aerial Port Operations Squadrons were assigned respectively to Mackall Airfield, Pope AFB, Seymour-Johnson Airfield, Charleston AFB, and Alexandria AFB.[43] The 1st, 2d, and 3d Squadrons had the additional responsibility of furnishing combat control teams, one of which was dropped on each of the five DZ's by the 314th and 456th Troop Carrier Wings a few minutes before the arrival of the first paratroop serials.[44]

Aeromedical Evacuation

Troop-carrier activity in Exercise TACAIR 54-7 included air evacuation of casualties. Overall administration and control of Air Force aeromedical evacuation forces deployed in the maneuver area were exercised by the newly formed USAF Tactical Medical Center, which had as its major component the 1st Aeromedical Group. As organized for TACAIR 54-7 the Tactical Medical Center operated with a central headquarters at Pope AFB, an advance headquarters at Mackall Airfield, and rear headquarters at Seymour-Johnson Airfield and Donaldson AFB. Attached to advance headquarters at Mackall—the main tactical headquarters—were an aeromedical supply element, a tactical evacuation flight, an evacuation control element, and a forward casualty staging flight (CSF). A rear CSF was placed at Seymour-Johnson Airfield.[45]

The key evacuation facilities in the forward areas were feeder flight elements, which were flown to the five DZ's by H-19 helicopter on A minus 1. Additional feeder flight elements were placed at the Army's 15th Field Hospital and 5th Evacuation Hospital and at the helicopter landing point near the Fort Bragg station hospital. The feeder flight elements were manned by flight surgeons, aeromedical technicians, and communication and administrative personnel. Their functions included receipt of patients from the Army, the sorting and classification of wounded, requesting of evacuation aircraft, and the interim treatment, manifesting, loading, and in-flight care of casualties.[45]

The Air Force was responsible for all air evacuation of casualties, either actual or simulated, from A-day until the paratroops linked up with the ground forces on A plus 6. Actual casualties were evacuated from the DZ's, from Mackall Airfield, or from the clearing company at Camp Mackall, to the 15th Field Hospital and from the 15th Field Hospital to the 5th Evacuation Hospital. The seriously injured were flown from the DZ's, from the clearing company, from Mackall Airfield, or from the 15th Field Hospital to the Fort Bragg station hospital. All of the actual evacuations were performed by H-19 helicopters attached to the 63d Troop Carrier Wing.[47]

Simulated casualties were evacuated from forward pickup points by H-19's or Army ambulances and moved to the forward casualty staging flight at Mackall Airfield. Here they were picked up by C-119's, which had airlanded supplies at Mackall, and were flown to the rear casualty staging flight at Seymour-Johnson Airfield. They were then turned over to the aerial port operations squadron and sent forward again as replacements.[48]

During the course of the exercise the Air Force evacuated 203 actual casualties and 98 simulated casualties. Aeromedical evacuation was confined to intratheater movement of casualties; intertheater evacuation was not played.[49]

Communications

Communication and control facilities for Exercise TACAIR 54-7 were provided by the 8th and 4418th Communications Groups and by the 507th Tactical Control Group. Point-to-point communications for Ninth Air Force were furnished by the 8th Communications Group and for Eighteenth Air Force (Adv) by the 4418th Communications Group. These communications included radio teletype, radio telephone, and radio relay links connecting the various units of each air force.[50]

Tactical air control system facilities provided by the 507th Tactical Control Group consisted of a TACC, located at Pope AFB, and three TADC's, one at Shaw AFB, one at Robbins AFB, Georgia, and one at Coolyconch Mountain near Fort Bragg. Also part of the system were a TADP at Newton Hill, Fort Bragg, and L/W radar stations at Myrtle Beach, South Carolina, Augusta, Georgia, Charleston AFB, Seymour-Johnson Airfield, and Donaldson AFB.*[51]

Ninth Air Force furnished a total of 15 forward air controllers (FAC) for the exercise.† Nine FAC's worked with the 82d Airborne Division, four with the 37th Infantry Division, and two with the Aggressor force. The 82d Airborne Division FAC's were moved to the five DZ's administratively—by helicopter—a few minutes before the 82d began its airdrop on A-day. To control air strikes, the FAC's used AN/MRC-20 radios mounted on vehicles, portable Navy May radio sets, and AN/ARC-27 radios mounted in helicopters.††[52]

Airborne Electronic Warfare Operations

Activities in the field of communication included airborne electronic warfare operations. These operations were carried out by the 363d Tactical Reconnaissance Wing's 9th Tactical Reconnaissance Squadron, which was equipped with two RB-26 ferret-type aircraft and three B-26 and one B-25 jammer-type aircraft. The 9th Squadron flew a total of 54 electronic warfare sorties. Included were 35 jamming sorties and 19 ferret and hunter-killer sorties, the latter flown by RB-26's that had the capability not only to ferret out an electronic signal but also to home on the source of the signal and destroy the installation. Electronic warfare aircraft succeeded in jamming 41 communication signals and 29 radars. The ferret and hunter-killer sorties resulted in the "destruction" of eight installations. In addition, 4,134 chaff units were dispensed.[53]

Atomic Weapons Operations

Exercise TACAIR 54-7 was marked by extensive special weapons operations. Ninth Air Force simulated the expenditure of 14 atomic bombs. Six of the strikes were made by B-61's of the 69th Pilotless Bomber Squadron, seven were carried out by F-84's of the 405th Fighter-Bomber Wing, and one was a completely simulated mission by the 405th Wing.

In order to gain air superiority before the airborne assault, 405th Wing F-84's on A minus 1 (25 April) hit Aggressor airfields at Cherry Point, North Carolina, Florence, South Carolina, and Myrtle Beach, South Carolina; and a 69th Squadron B-61 on the same day struck at Turner AFB, Georgia. Four more atomic strikes were carried out on A-day. The 69th Squadron attacked Moody AFB

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*Before TACAIR 54-7 was conducted, there was a change in the designations of the various tactical air control system facilities. To avoid confusion, the old designations—the ones in effect during Exercises SOUTHERN PINE, SNOW FALL, LONG HORN, and COLD SPOT—are also used in this treatment of TACAIR 54-7. The following are the changes in these designations:

Old Designation	*New Designation*
tactical air control center (TACC)	air control center (ACC)
tactical air direction center (TADC)	control and reporting center (CRC)
light-weight (L/W) radar	control and reporting post (CRP)
tactical air direction post (TADP)	target director post (TDP)
tactical air control party (TACP)	air control team (ACT)

†These controllers were provided by various Ninth Air Force units. The 941st Forward Air Control Squadron, which had supplied all FAC's for Exercise COLD SPOT, was inactivated shortly before TACAIR 54-7, on 9 March 1954.

††Except for the helicopters and their AN/ARC-27's, all FAC radios and vehicles were furnished by the Army. On 1 January 1954 the Army assumed responsibility for providing this FAC equipment.

in a continuation of the air superiority effort; and the 405th Wing, in order to block the movement of Aggressor troops, equipment, and supplies into the airhead area, hit marshaling yards, supply depots, and ordnance shops at Hamlet and Laurinburg, North Carolina, and attacked a large troop and equipment concentration at Seagrove, North Carolina.[54]

On A plus 1 an F-84 dropped an atomic bomb on New Hanover Airfield, Wilmington, North Carolina, and on the following day the Imeson Airfield, Jacksonville, Florida, was hit by a B-61. The 69th Squadron was especially active on A plus 4 (30 April), when the B-61's were used against Lake City Airfield, South Carolina, the Wilmington dock area and marshaling yards, and tank and troop concentrations at Hamlet. On the last day of the exercise (5 May), in answer to an Aggressor army request, the 405th Wing made an atomic attack on U.S. forces' 280-mm. guns, 280-mm. ammunition storage igloos, a missile launch site, and garrison at the Fort Bragg Ordnance Depot. This mission was entirely simulated, and no aircraft was flown over the target.[55]

The atomic attack on the Fort Bragg Ordnance Depot was the only atomic mission flown for the Aggressor. The remaining 13 missions were flown for the U.S. forces. Of these, 10 were initiated by the Air Force, 2 were flown in answer to a Third Field Army request, and 1 was requested by both services. Requests for atomic strikes were processed in the JOC in much the same manner as requests for strikes with conventional weapons. Army requests were submitted by the G-3 air officer on standard Ninth Air Force Joint Operations Center Form 1. No request for Air Force delivery of an atomic weapon could be honored without securing the approval of the theater air commander, who in this case was also Commander, TACAIR 54-7.[56]

Atomic warfare operations were also carried out by the Army, using its own delivery means. Atomic delivery and atomic support units assigned to the U.S. forces in Exercise FLASH BURN included the 3d Field Artillery Battery (Honest John rocket), the 246th Field Artillery Battalion (Corporal guided missile), the 663d Field Artillery Battalion (280-mm. gun), the 15th Ordnance Special Weapons Support Battalion, and the 96th Ordnance Guided Missile Direct Support Company. Assigned to the Aggressor forces was Battery B of the 216th Field Artillery Battalion (280-mm. gun). During Exercise FLASH BURN the U.S. forces expended eight atomic weapons. Six were delivered by the Corporal missile and two by the 280-mm. gun. The Aggressor employed four atomic weapons. One was delivered by a simulated guided missile and three by the 280-mm. gun, simulating an Aggressor 300-mm. artillery piece.[57]

CHAPTER X

EXERCISE TACAIR 54-7—FINDINGS

Exercise TACAIR 54-7, which was the largest training exercise held by Tactical Air Command during fiscal year 1954, produced a number of significant findings relating to such matters as planning and organization; reconnaissance, fighter-bomber, light bombardment, pilotless bomber, and troop-carrier operations; communications; and atomic weapons operations.

Planning

Planning for Exercise TACAIR 54-7, in the estimation of certain troop-carrier units, was hampered by the make up of Eighteenth Air Force Operation Order 60-54 and by the late receipt of this order. The 456th Troop Carrier Wing had difficulty preparing its operation order because of the length of the Eighteenth's order and because of its numerous amendments. The voluminous size of the order was also criticized by the 464th Troop Carrier Wing, which believed that the order could have been reduced by at least one-half. The complexity of the order, the duplications it contained, and its late receipt were further causes for complaint. The wing found that all of these factors created confusion and unnecessary work and made execution of the order extremely difficult.[1]

There were discrepancies also in Ninth Air Force planning. During the first few days of the exercise, reconnaissance operations were hindered because plans did not contain enough detailed information. Planning for communications was complicated by the necessity to begin planning before the operational concept of the exercise was firmly established. Lack of knowledge of details of the operational plans and the frequent changes in these plans required communication planners to make many changes before the final communication plan was completed. The early formulation of a detailed concept of operations is especially important to those responsible for insuring that Air Force communications are compatible with those of the Army. Communication and electronic planning staffs for the two services must have this information in order to establish requirements for and coordinate such matters as circuits, frequencies, channels, crystals, nets, lines, terminals, cryptographic systems, and radar coverage and equipment.[2]

Shortcomings in Ninth Air Force reconnaissance and communication planning were balanced somewhat by effective logistic planning. The Ninth found that advanced planning to determine basic requirements for equipment, facilities and qualified personnel greatly reduced logistic difficulties during the exercise.[3]

Organization and Command Structure

Closely related to the problem of proper planning for the exercise was the matter of organization and command structure. Exercise TACAIR 54-7 was a unilateral Air Force exercise held in conjunction with Army Exercise FLASH BURN, and there was no joint commander or joint staff. A similar organization had been used for Exercises COLD SPOT and SNOW STORM. Following these exercises there had been a serious disagreement between the two services over the effectiveness of the unilateral organization as compared with the joint organization, with the Air Force generally supporting the unilateral organization and the Army favoring the joint.*

The Army took substantially the same position with regard to the organization for TACAIR 54-7 and FLASH BURN as it had for COLD SPOT and SNOW STORM. The FLASH BURN maneuver director reported that the planning and execution phases of the exercise suffered from the lack of a

*See above, pp. 84-85.

joint commander and staff. After making the same observation, the FLASH BURN G-3 section report went on to stress particularly the difficulty of tying together the TACAIR 54-7 and FLASH BURN intelligence play simply by coordination and cooperation. The report held that in a controlled maneuver it was important that the maneuver commander be able rapidly to effect changes in the situation confronting the friendly forces in order to insure that the maneuver objectives are achieved. Thus, the report continued, he needed an organization or staff, an instrument of control, that would insure rapid and full coordination of these changes with all participating units, regardless of service. The requirement for speed and flexibility in this matter dictated the need for a joint maneuver commander and a joint staff.[4]

The Army position was reinforced by the Joint Airborne Troop Board's report on FLASH BURN.[5] This report made the point that because of its size FLASH BURN (and TACAIR 54-7) should have been planned and conducted as a major joint exercise. To insure maximum joint training in an exercise of this magnitude, said the report, plans should be jointly prepared, the initiating directive should be issued jointly, and there should be a jointly agreed upon maneuver commander, assisted by a deputy commander from each service. The report stated further that in this exercise the failure to adopt an organizational structure consistent with an organizational structure for actual joint operations seriously impaired the joint training received by senior commanders and their staffs.*

Although the Air Force had generally approved of the separate or unilateral organization for COLD SPOT-SNOW STORM, there was considerable Air Force agreement with the Army's claim that FLASH BURN-TACAIR 54-7 should have been a joint undertaking. There was no indication that the Air Force had changed its mind about the efficacy of the unilateral organization for small-scale exercises of the COLD SPOT-SNOW STORM type, but there was evidence that the Air Force recognized the necessity for joint planning and control of large-scale exercises like FLASH BURN-TACAIR 54-7.

Early in September 1953, several months before these exercises were conducted, General Thomas D. White, Vice Chief of Staff, USAF, wrote to the Army Chief of Staff expressing regret that the Air Force would be unable to collaborate on a joint command arrangement for Exercise FLASH BURN, an arrangement that would have provided for a joint maneuver director and a staff composed of representatives from both services. General White's letter indicates that a joint command for FLASH BURN was turned down not because such an arrangement was opposed by the Air Force on principle, but rather because planning for FLASH BURN had already progressed so far that the changeover to a joint command was not practicable and because personnel resources for such a command had not been programmed by the Air Force.[6]

In its report on TACAIR 54-7 the USAF Observer Team recommended that exercises of this type be set up like a theater operation, especially in organization and command structure.[7] If followed, such a recommendation would likely result in exercises of this kind being conducted as joint exercises, with the joint maneuver commander serving as the theater commander.

The Ninth Air Force position on this matter was that the organization and command structure established by Tactical Air Command for the conduct of unilateral exercises of the scope of TACAIR 54-7 had proved to be workable. However, in a statement that indicates some agreement with the Army's views, Maj. Gen. E. J. Timberlake, the Ninth's commander, repeated the recommendation made after Exercise LONG HORN† that a joint planning group be created at Tactical Air Command-Army Field Forces level to handle the overall planning of training exercises. For joint exercises or for unilateral exercises of the FLASH BURN-TACAIR 54-7 type, this group would move into the field and become the theater commander's staff. The same joint staff that planned the exercise would have a hand in controlling it, and questions as to policy and doctrine could be resolved by this group on a day-to-day basis as they arose. Such an arrangement, Ninth Air Force believed, would still permit unilateral activity at the tactical air force-field army level.[8] This plan,

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*As it had after previous exercises, the Army also advocated the use of a joint task force organization for airborne operations. See below, p. 116.

†See above, pp. 59-60.

it seems, would allow the services to go on conducting unilateral exercises like TACAIR 54-7 and FLASH BURN, but it would permit joint planning and control, the lack of which was the basis for the Army complaint.

Besides recognizing the need for joint planning and control of training exercises that involved joint operations, Ninth Air Force stressed the need for conducting such exercises, whether they were unilateral or joint, according to a realistic concept of theater operations. After COLD SPOT-SNOW STORM Tactical Air Command and Eighteenth Air Force defended the concept of jointly phased unilateral exercises on the grounds that unlike past joint exercises, which so often had limited the Air Force to action in support of the ground effort in a relatively small maneuver area, the unilateral type of exercise allowed the Air Force not only to support the Army but to carry out unilaterally a variety of theater-wide tactical air missions.* Comments by Ninth Air Force indicate that unilateral Exercise TACAIR 54-7 was just as narrow in concept as the earlier joint exercises. Air Force operations were confined to the support of the Army in a limited area, and there was insufficient opportunity to illustrate or to evaluate the full capabilities of tactical air in theater operations.[9]

Air Force Operations—Reconnaissance

Findings that stemmed from the operational phase of TACAIR 54-7 covered virtually the entire scope of tactical air activity. As in earlier exercises there were findings that related to reconnaissance, fighter-bomber, light bombardment, troop-carrier, and atomic weapons operations and communications. Also, for the first time in this study, attention must be given to pilotless bomber operations and to electronic warfare.

The improvement in reconnaissance operations that was noted during Exercise COLD SPOT† continued during TACAIR 54-7. Neither the Air Force nor the Army made unnecessary requests for photographs; the reconnaissance effort was sufficient to satisfy all requests; and according to General Timberlake, the support of Army units with visual and photo reconnaissance was excellent.[10]

Still, there were a number of reconnaissance shortcomings, particularly in visual and night reconnaissance. Improper reporting in and out (RIO) procedures, used by reconnaissance pilots in communicating with the TACC, resulted in uncertain aircraft identifications and in overcrowded communications. The latter condition was aggravated because the same VHF channel in the TACC was used for reconnaissance RIO, reconnaissance spot reporting, and troop-carrier RIO; and even if RIO procedures had been letter perfect, this one channel would have been overcrowded. The real need was to establish a reconnaissance common frequency in the TACC.[11]

Other factors adversely affecting visual reconnaissance were the failure of pilots to stay as long as they could in the area they were reconnoitering and the lack of thorough ground-situation briefings by reconnaissance squadron ground-liaison officers. The operation of large numbers of aircraft, particularly light aircraft, in the small maneuver area forced reconnaissance pilots to spend much of their time not on reconnaissance but on avoiding air collisions.††[12]

Night photo reconnaissance, which had been carried out so effectively in Exercise COLD SPOT, was less satisfactory in TACAIR 54-7. Because safety restrictions prohibited the use of photoflash bombs, night photo reconnaissance was limited to pictures that could be taken with the M-112 photoflash cartridges. Even these could be used only in selected sections of the FLASH BURN maneuver area, and only two of the night photo squadron's RB-26's were equipped with the A-3 cartridge ejector used to eject M-112 photoflash cartridges. Night visual reconnaissance was generally neglected; only a very few sorties were assigned to this task.[13]

The greatest reconnaissance deficiency in TACAIR 54-7 was the excessive delay in the delivery of photographs and reconnaissance information to the using units. Both the TACAIR 54-7 and

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*See above, pp. 84-85.

†See above, pp. 85-86.

††For a further discussion of the problem of the overcrowded maneuver airspace see below, p. 113.

FLASH BURN reports examined this matter in detail; both services took pains to determine the reasons for the delay; and both advanced practical solutions to the problem. Their reports indicate that much of the delay was caused by inadequate means of delivering photos to corps and to the divisions and by the confusing system of numbering Army reconnaissance requests and Air Force reconnaissance missions flown in answer to these requests.

The Army's XVIII Airborne Corps found that the time lapse from requested time on target to receipt of photos in the field averaged 27 hours and 45 minutes, and to shorten this time-space it recommended the development of techniques for delivering photos by helicopter or by parachute from high-performance Air Force aircraft or Army light aircraft.[14] Delivery by parachute was tried during the exercise, and on 1 May an Air Force T-33 jet trainer dropped 42 prints to XVIII Airborne Corps, saving an estimated 9½ hours.[15]

The delivery of aerial photos to Army units, it should be pointed out, was an Army responsibility. In FLASH BURN photos were printed by the 67th Engineer Aerial Photo Reproduction Company, which was a part of the joint air photo center at Shaw AFB, and were flown from Shaw to the using Army units by an Army Signal Corps liaison aircraft. The G-3 section of FLASH BURN headquarters pointed out that one light aircraft was not sufficient for the delivery of photos in an exercise like FLASH BURN, where the reconnaissance airfield (Shaw AFB) was 110 air miles from the airhead and 130 miles from the JOC via the airhead. Moreover, none of the units in the airhead had points of delivery adjacent to their headquarters, and all deliveries had to be made to Mackall Airfield, where the units picked up the photos at message center pickup points.[16]

In a special report submitted by two officers from the 363d Tactical Reconnaissance Wing, who acted as reconnaissance advisers to the Army, it was estimated that three-fourths of the time consumed in requesting, procuring, producing, and delivering aerial photos for the Army was used by the Army and only one-fourth by the Air Force. The Army air-request system worked well, and most requests reached the JOC over the air-request net within one hour of the time they originated in the requesting unit. Most of the Army delay, these officers found, was caused by defects in the Army delivery system. The average time from the moment photos were reproduced by the Army at the joint air photo center until they were delivered to the requesting unit was 17 hours and 45 minutes. To speed up delivery, these officers recommended that in future maneuvers on the scale of Exercise FLASH BURN courier aircraft capable of night and all-weather flights make a minimum of four deliveries per day and that a special alert courier aircraft be maintained on 15-minute call to deliver high-priority photographs and reports.[17]

This delivery problem was not confined entirely to the delivery of photos to the Army. The Air Force had trouble making rapid deliveries of photos and photo interpretation reports to the intelligence section of Ninth Air Force headquarters at Pope AFB. An investigation of this deficiency revealed that courier aircraft from Shaw AFB, the reconnaissance airfield, were delivering all mail, regardless of priority, to base operations at Pope and turning it over to the dispatcher; no instructions regarding the delivery of priority mail had been issued to the courier, and no system had been set up to insure rapid delivery of courier mail after it reached Pope.[18]

Both the Army and the Air Force were severely critical of the system of numbering reconnaissance requests and missions. XVIII Airborne Corps claimed that the Air Force system of numbering missions made it almost impossible to identify the visual reconnaissance reports, flash aerial photography interpretation reports, and aerial photos received by corps with the specific requests it had submitted. The corps G-2 air officer was unable to determine whether reconnaissance of specified areas had been accomplished or was still outstanding, and as a result, all aerial reconnaissance planning was seriously handicapped.[19]

The Air Force reconnaissance report dealing with this problem stated that, in accordance with the system used during the exercise, an Army division would initiate and number a request, which, if approved, would get in turn a different number from each of the following: corps, JOC G-2 air officer, JOC reconnaissance element, the tactical reconnaissance group, and the tactical reconnaissance squadron. Unless the coordination was excellent at all levels, it was difficult and sometimes impossible to match the requests to the photos when the latter got back to corps or division.[20]

To solve this problem XVIII Airborne Corps recommended the adoption of a standard method of numbering reconnaissance missions. Ninth Air Force suggested the establishment of a numbering system that would be acceptable to both services and would make possible the immediate identification of photos at any level.[21]

The Army also had difficulty in disseminating reconnaissance information. This information was normally sent by radio over the Army information net, which connected the G-2 air division in the JOC, the ground liaison officer at the reconnaissance airfield, and the G-2 air officer at the corps fire support coordination center (FSCC). Reconnaissance information received at the corps FSCC over this net had to be retransmitted to the divisions by telephone, radio, or messenger. To avoid the delay involved in this procedure, XVIII Airborne Corps recommended that the Army information net be broadened to include the divisions as well as corps. XVIII Airborne Corps stated also that there had been a failure of Army communications for receiving spot reports direct from reconnaissance aircraft and recommended that tests be made to determine whether the VHF component of the forward air controller's AN/MRC-20 radio set could be used to monitor the reconnaissance channel.[22]

One of the brightest spots in the reconnaissance picture was the effectiveness of the joint air photo center (JAPC) at Shaw AFB, which was composed of Air Force and Army photo reproduction and interpretation facilities. According to Ninth Air Force, the organization and operation of this center were "highly successful," and General Timberlake, speaking at the FLASH BURN critique, called it "the best supported facility of its kind I have seen either in maneuvers or during the first year and one-half in Korea."[23]

Ninth Air Force did have one important suggestion to make regarding the JAPC, which normally is located at the airfield of the reconnaissance wing. The Ninth recommended that in some future exercise it be established at numbered air force level, on the supposition that the Air Force component of the JAPC—the reconnaissance technical squadron—could operate more effectively at numbered air force level. In support of this view the Ninth pointed out that the intelligence produced by the squadron was used to support the mission of an air force rather than the mission of a reconnaissance wing; moreover, the need for photo reproduction and interpretation and a film library often existed at numbered air force level and placing the reconnaissance technical squadron at this level would eliminate duplication of functions, personnel, and equipment.[24]

Fighter-Bomber Operations

Fighter-bomber operations in Exercise TACAIR 54-7 were conducted principally by F-86's of the 21st Fighter-Bomber Group. The group encountered no major operational difficulties. Operating under field conditions throughout the exercise, the group accomplished its primary mission of providing maximum training for its pilots and support personnel under simulated combat conditions. One inconvenience reported by the 21st Group and also by the 391st Fighter-Bomber Squadron (Aggressor air) was the insufficient time allowed for the operating units to become thoroughly familiar with Ninth Air Force combat operations notices to airmen (NOTAMS) before the exercise began. It was necessary during the first part of the exercise to include in daily operations orders information that was already covered in the NOTAMS file, thus increasing the preparation and publication time of the operations orders. The Ninth Air Force suggested that the Ninth's operations NOTAMS file be revised periodically so that it would serve as a current reference for procedures to be used in exercises or demonstrations. It recommended also that revised NOTAMS be published at least 15 days before the beginning of an exercise.[25]

Close Support

Although fighter-bomber operations were in the main satisfactory, a number of deficiencies existed in the field of close support. Many of these can be attributed to the Army's misunderstanding of the principles and procedures governing the conduct of air operations. That the Army was aware of its shortcomings in this regard was clearly indicated in the FLASH BURN final report, which stated

that "there were repeated demonstrations of a lack of knowledge of the capabilities of the air weapon."[26]

A number of comments in Ninth Air Force reports attested the validity of this statement. In several instances the Army called for close-support strikes on targets unsuitable for air attack. Reports from air liaison officers (ALO) and forward air controllers (FAC) indicated that few Army personnel understood the Army's air-ground operations system and few knew the the procedure for requesting air strikes. Army requests normally were forwarded over Army communications channels to the JOC, although in many cases a frontline unit commander needing air support simply asked the FAC, who normally acted as a controlling rather than a requesting agency, to call aircraft down from overhead or requested the FAC to "get me some air."[27]

Control of close-support strikes by FAC's was a problem throughout the exercise. Preventing effective control were a number of factors. Most of the AN/MRC-20 radios that the Army was supposed to provide to the FAC's for control of air strikes* were kept instead at the regimental command posts for use in the air-request net. The FAC's deprived of their most reliable means of air-ground communication had to rely mainly on the less dependable Navy May set and the H-19 helicopter's AN/ARC-27. To Ninth Air Force it seemed that if the Army intended to continue using the MRC-20 for the air-request net, other MRC-20's would have to be made available for the exclusive use of the FAC's.[28] The FAC's were not always notified when a unit requested an air strike and frequently lacked strike request confirmation from the Army's air-ground operations section in the JOC. On one day early in the exercise, for example, this confirmation was reaching the FAC's three hours after strikes had been controlled. Without prior knowledge of air strikes the FAC's had difficulty positioning themselves for control. To complicate matters further, fighter-bombers, which were to check in with the ALO at the division fire-support coordination center (FSCC) and were then to be directed to an FAC for control, were reporting in with a mission number that meant nothing to the ALO since he had not been notified of the strike. This circumstance made it difficult for the ALO to determine to whom the flight belonged and to alert the proper FAC. On some occasions poor communication prevented the ALO from notifying the FAC's that flights were coming to them for control.[29]

This latter problem was especially noticeable during the early days of the airhead operation and before the 82d Airborne Division FSCC had established reliable communications with frontline units in the vicinity of the five DZ's. Because of this poor contact the ALO at the FSCC could not always send air alert aircraft, which reported first to him, on to the frontline FAC's, who were to control the strikes. To remedy this defect, Ninth Air Force recommended that in the initial phase of an airhead operation and until communication was established between the FSCC and the frontline units, air alert aircraft bypass the FSCC and report directly to specific FAC's.[30]

The Army had some complaints of its own relative to FAC activities. XVIII Airborne Corps observed that the Air Force had not provided a sufficient number of FAC's and reviewed an Army unit's request made in connection with previous exercises that the Air Force furnish one FAC per rifle battalion. Taking note, no doubt, that the FAC's did not jump with the paratroops but were placed on the DZ's by H-19 helicopters before the drops, the 82d Airborne Division recommended that in future operations of this nature the FAC's be qualified parachutists.[31]

To the criticism concerning the number of FAC's, Ninth Air Force answered that FAC's should not be attached to specific Army units but should be placed with Army frontline units in accordance with the demands of the situation. There can be little doubt, however, that the Air Force stood on shaky ground as far as the jump-trained FAC's were concerned. Actually, Ninth Air Force was plagued by a serious shortage of jump-trained controllers, a shortage that evidently influenced the decision to deliver them by helicopter. Before the exercise the Ninth expressed the opinion that this procedure would still provide realistic training, the implication being that FAC's could be delivered in this manner in combat. In practice, however, they were moved to the DZ's nontactically 30 minutes before the main airdrop, and thus the aim of furnishing realistic, tactical training in this technique was not achieved.[32]

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*See above, p. 105, n.

A special feature of FAC activity in TACAIR 54-7 was the so-called H-19 Test Program, which was designed to test the feasibility of using H-19 helicopters as forward air control vehicles. On each of the five DZ's used by the 82d Airborne Division one H-19 with an FAC was placed. One H-19 was located at the division FSCC and sent to control strikes in outlying regimental areas where no control vehicle or air-to-ground communications were available. The others were located at the regimental command posts and were sent out to control strikes for the frontline battalions.[33]

This test demonstrated that the helicopter was vastly superior to any ground control vehicle in flexibility, mobility, and speed. Used as an elevated platform it provided the FAC with excellent visibility and greatly simplified target recognition and description. Ninth Air Force seemed well satisfied with the test and was particularly impressed with the prospect that the helicopter's speed and mobility could make it possible for one FAC to do the work of several, thus reducing the number of FAC's required by an infantry division.[34]

The results of the H-19 Test Program were not, however, entirely favorable. Helicopters dispatched from a central point such as the division FSCC can be used as airborne platforms, from which the FAC's control strikes, or they can be employed for the rapid delivery of FAC's to frontline positions, where they can exercise control from the ground. In the first instance the helicopter acts as a control vehicle; in the second it serves as a means of transportation. But when used as a control vehicle, the helicopter appeared to have one major weakness—vulnerability to enemy fire, even small arms fire. Ninth Air Force believed that in combat the vulnerability of this type of aircraft to all types of fire would result in heavy losses. The 2d Liaison Squadron, which furnished the H-19's for the test program, did not rule out the use of the H-19 for control, but it did suggest that smaller types such as the H-13 or H-22 would require less maintenance and logistical support and would be less susceptible to enemy ground fire.[35]

Another deficiency of the H-19 as a control vehicle lay in its communication system. For contact with strike aircraft the FAC used the helicopter's AN/ARC-27 radio. This radio has no external power supply but is dependent on the helicopter's batteries. If the helicopter engine is not running, the radio saps the life of the helicopter batteries in a short time. When the helicopter is on the ground with its engine off, the FAC can not use the radio and has no means of monitoring fighter-bomber radio channels.[36]

In the airhead area close-support operations were handicapped by the large number of Army liaison aircraft and helicopters operating over the frontlines. They constituted a definite safety hazard during close-support attacks, and in several instances the JOC had to divert fighter-bomber strikes or cancel them because of light-plane traffic in the target area. Both services took note of this problem and stressed the need for better coordination and control. A practical solution advanced by Ninth Air Force was to have the target area cleared before the arrival of strike aircraft by FAC's using the communication facilities of the division FSCC to warn Army light aircraft to leave the area.[37]

Light Bombardment Operations

Light bombardment operations by B-26 night intruder aircraft from the 4400th Tactical Bombardment Group (Tng)* met with only moderate success. The B-26's had only a limited all-weather capability. None of them was equipped with the AN/APW-11 radar beacon used to extend the range at which aircraft can be controlled by the AN/MSQ-1 close-support-control ground radar, and only nine were equipped for Shoran operations.[38]

The all-weather capability of these aircraft was further limited by the heavy commercial-carrier and troop-carrier traffic in the maneuver area. During actual weather conditions the lack of proper traffic control in the small maneuver area made all-weather night intruder missions virtually impossible. Much better results could have been attained if night intruder aircraft had been assigned

*All three squadrons of the 4400th Group took part, but they were used in rotation, with only one squadron flying each day.

block altitudes from Langley AFB, their operating base, to the maneuver area and return and if the TACC had maintained strict control by radar surveillance in the maneuver area.[39]

Shoran operations were handicapped not only by lack of equipment in the B-26's but also by delays that occurred in connection with Shoran target computation. Target computations were furnished by a Shoran computation team of the 8th Shoran Beacon Unit. Since this unit was located at Shaw AFB, the considerable delay in furnishing target computations to the JOC at Pope AFB prevented the B-26's from striking some very worthwhile targets. If the computation team had been located near the JOC much of this delay could have been avoided.[40]

Pilotless Bomber Operations

Pilotless bomber (B-61 Matador) operations in Exercise TACAIR 54-7, though conducted on a small scale, produced a number of significant findings, mostly to do with target computation. Computation of target data by the B-61 squadron's target computation team lacked realism because of the failure to use actual weather information. All of the weather information was simulated. Practical training would have been enhanced by the use of actual weather forecasts, since such information is used in the AN/MSQ-1 and Shanicle* guidance systems for the B-61.[41]

It was important in B-61 operations that exact coordinates of all probable targets be furnished well in advance of the missions. This is especially vital, for when the Shanicle guidance system is used, considerable time is required to perform and check the lengthy basic computations. It was also learned that the pilotless bomber computation team was capable of computing data for Shoran targets. Whether the Shoran computation team could also do the computations for a B-61 target was not determined, but the Ninth Air Force report on pilotless bomber operations recommended that these two computation teams be combined and be stationed at the JOC.[42]

Joint Operations Center

The performance of the JOC in TACAIR 54-7 was by and large effective, and cooperation between the Air Force and Army staffs was excellent throughout the exercise. In the early stages of the exercise, however, there was a certain amount of confusion resulting from the relative inexperience of JOC personnel, inexperience on the part of tactical units that were working under JOC control for the first time, lack of familiarity with JOC forms and procedures, and lack of continuity in operations caused by the rotation each day of three complete JOC staffs. These difficulties were largely overcome within five days after the exercise began. But to insure smoother operations from the beginning, the Ninth Air Force JOC report recommended that JOC personnel report for duty three to five days before the starting date of a maneuver and conduct a command post exercise in order to familiarize themselves with JOC procedures, communications, and Air Force doctrine. This report recommended also that JOC procedures, communications, and flying safety measures be given special emphasis during the pre-exercise conferences.[43]

The functioning of the JOC in Exercise TACAIR 54-7 produced a certain amount of disagreement between the Air Force and the Army over the level at which this facility should operate. One of the Ninth Air Force reports refers to a recommendation "being submitted through Army channels by Major General Cleland [Commanding General, XVIII Airborne Corps] for the establishment of a JOC at corps level." In a strong rejoinder to any such proposal Ninth Air Force argued that placing a JOC at corps level would result in a parceling out of the tactical air force effort. According to established doctrine, the JOC is located at tactical air force-field army level, where, the Ninth insisted, it had proved adequate for the planning, coordination, and control of Air Force functions in support of ground force operations. Moreover, it was through a central control agency at this level that the flexibility and mobility of a tactical air force could best be exploited.[44]

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*Short range navigation vehicle.

Troop-Carrier Operations

A major part of the Air Force effort in TACAIR 54-7 was devoted to troop-carrier operations carried out in support of Army Exercise FLASH BURN. Overall, the Air Force performance in this field was a good one. In the drops of personnel and equipment on A-day and A plus one timing was superior and accuracy was extremely good. An exception was the A-day drop on DZ G by the 456th Troop Carrier Wing. In this instance 50 percent of the paratroops landed just to the left of the DZ. On A plus one, however, 95 percent of all personnel and equipment landed within the DZ's. On both days, aborts were few, and all were made up by adding to later serials.[45]

Despite this good performance there were several suggestions for improvements. All personnel drops in this exercise were made by C-119 aircraft, but the TACAIR 54-7 final report stressed the need for exploiting the full airdrop capability of the C-124 by using it for airdrop of personnel. Flaws were detected in the heavy-drop system. During heavy-drop operations, the 314th Troop Carrier Wing experienced five equipment-drop malfunctions, two caused by shot bags blowing back into the aircraft and three by extraction system delays. In view of incidents like these, the TACAIR 54-7 final report recommended that the highest priority be given the development for the C-119 of an improved heavy-drop system that would provide for instantaneous release and ejection of heavy-drop loads.[46]

In its discussion of personnel and equipment drops the Joint Airborne Troop Board report observed that peacetime safety restrictions of 7,500 pounds with clamshell doors removed and the high minimum speed of 125 knots did not permit full use of the combat potential of the C-119. The weight restriction precluded the heavy-drop of the 2½-ton truck, certain engineer equipment, and the 105-mm. howitzer and its prime mover. The relatively high minimum speed of 125 knots prevented the dropping of personnel and monorail bundles simultaneously from the same aircraft. Because bundles were moved administratively to the airhead 100 percent of them were recovered, and troops operated with equipment that had not been exposed to the possibility of airdrop damage.[47]

Airlanding Operations

Airlanding of troops, supplies, and equipment at Mackall Airfield by C-119's—operating from Pope AFB, Charleston AFB, and Seymour-Johnson Airfield—was conducted without any major deficiencies. The 456th Troop Carrier Wing encountered the only real difficulty in a corridor type of operation on A plus 2, when its aircraft, due to land at Mackall at five-minute intervals, had trouble maintaining this schedule. The wing's C-119's left Charleston AFB at five-minute intervals, but strong tailwinds forced the planes to fly at very low cruising speeds and made it hard to land on time at Mackall. In light of this experience the wing recommended that arrival times not be assigned for large-scale corridor operations. The wing followed a different procedure on A plus 4, one that worked much better than that used on A plus 2. Aircraft left Charleston at five-minute intervals and maintained airspeeds of 150 knots, and proper spacing was insured by using communication checkpoints.[48]

An important part of airlanding operations in TACAIR 54-7 was the airlift of the 37th Infantry Division from Alexandria AFB, Louisiana, to Mackall Airfield by C-124's of the 63d Troop Carrier Wing, based at Donaldson AFB, South Carolina. For the first 45 sorties the lift went smoothly. Then because of bad weather, maintenance difficulties, aborts, and delays in loading and unloading, the lift fell behind schedule and could not be completed before the end of the exercise. Bad weather, which continued during most of the period of the lift, contributed most to the breakdown of the schedule, and the failure of the operations plan to prescribe alternate route procedures to be followed in the event of inclement weather intensified the problem. The matter of crew rest was another complicating factor. When aircraft were diverted from their established routes or were delayed at Alexandria or Mackall, flights sometimes had to be held up in order to conform to regulations governing crew rest.[49]

One of the by-products of these various delays was a breakdown in the system of numbering aircraft and aircraft loads. Chalk numbers were placed on the aircraft at their home station,

Donaldson, to correspond with the numbers of the loads they were to pick up at Alexandria, and the aircraft left Donaldson in numerical order. However, there was no assurance that aircraft would reach Alexandria in the correct order, and it was difficult to match correctly the aircraft and loads at Alexandria. This situation could have been avoided if chalk numbers had been assigned at Alexandria rather than at Donaldson.[50]

The Problem of Realism in TACAIR 54-7 Troop-Carrier Operations

Another deficiency in this exercise, one that affected all troop carrier-airborne operations, including airdrops and airlandings, was lack of realism. The drop of the assault elements of the 82d Airborne Division was carried out over a two-day period. In a similar situation in combat these elements would have been dropped simultaneously. The FLASH BURN maneuver director's report attributed this unrealistic procedure to the failure of the Air Force to supply a sufficient number of C-119 aircraft. But most other sources, some of them Army, place the blame on the shortcomings of the Camp Mackall maneuver area. This area, according to the XVIII Airborne Corps report, was poorly suited for an exercise of this type because of artificialities imposed by the size and configuration of the area, the haphazard directional lay of the DZ's, and restrictions on maneuver rights. The Joint Airborne Troop Board report, which may be taken as a reflection of the Army viewpoint, states that the restricted size of the objective area, with its single airfield, Mackall, and with its DZ's in close proximity to each other, required troop-carrier aircraft to take varying routes of approach that precluded simultaneous as well as concurrent drops and airlandings. This report also pointed out that the airlanding of the 37th Division and its tactical deployment were seriously hampered by the fact that only one forward airfield was employed.[51]

The TACAIR 54-7 final report presented a similar view of this matter, stating that the use of only one forward airfield and the small size of the airhead prevented the simultaneous delivery of personnel, supplies, and equipment by airdrop and airlanding and otherwise restricted the inherent flexibility of troop-carrier operations.[52]

Eighteenth Air Force was especially critical of the DZ's used in the exercise. According to the Eighteenth, one or more of the dimensions of each of the five DZ's failed to meet the minimum requirements for accurate placement of personnel and equipment by airdrop from aircraft flying in formation. The size, axis, condition, and location of the DZ's were not approved by the Eighteenth before the exercise and so far as the Eighteenth could determine, the DZ's were selected by the Army without any consultation with the Air Force.[53]

Command Structure for Airborne Operations

After the exercise the Army expressed dissatisfaction with the command structure for the conduct of airborne operations. The Army believed that Exercises TACAIR 54-7 and FLASH BURN should have been combined as a joint maneuver with a joint commander and staff,* and it seems clear that there was some feeling also that a joint task force should have been formed to conduct the airborne operation in these exercises. XVIII Airborne Corps recommended that a joint task force be established for all future airborne maneuvers, and the 82d Airborne Division G-3 section claimed that "the formation of a Joint Airborne Task Force would improve cooperation and coordination between ground and Air Force units for the planning and conduct of airborne operations."[54] Air Force reports on TACAIR 54-7 contained no references to this problem, but there were no indications that the Air Force position taken in connection with previous exercises had changed—the position that in most cases airborne operations should be carried out under the normal theater command structure rather than under a joint task force organization.†

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*See above, pp. 107-9.

†See above, pp. 21-22, 44, 87-88.

Aerial Port Operations

Other troop-carrier functions in Exercise TACAIR 54-7 were the operation of aerial ports and the aeromedical evacuation of casualties. The job of furnishing aerial port facilities and loading, lashing, ejecting, and unloading supplies and equipment was performed by five aerial port operations squadrons, which worked under the combat airlift support units at the maneuver airfields. The doctrine and concept of operations for these squadrons proved sound, and the squadrons demonstrated their ability to support large-scale airborne operations.[55]

Still, there were a number of deficiencies in aerial port operations. A need existed for improving the equipment used by the aerial port operations squadrons, particularly tie-down equipment and materials handling equipment such as forklifts, trucks, and aircraft cabin winches. A need for further study of ejection systems and the palletization of aircraft loads was also indicated. According to the 61st Troop Carrier Group, a heavy group equipped with C-124 aircraft, the aerial port squadron personnel displayed a lack of experience in the loading and unloading of the C-124. And Eighteenth Air Force representatives who supervised the activities of these squadrons during the exercise observed that there was need for a manual that would standardize traffic procedures in these squadrons and serve as a guide for personnel operating air terminals within combat airlift support units during maneuvers.[56]

The Eighteenth Air Force was not wholly satisfied with the application of the Memorandum of Understanding Relating to the Operation of Air Force Air Terminals, which had been drawn up by the Air Force and Army Chiefs of Staff and published early in 1953, shortly before Exercise COLD SPOT.* During the air movement of Army units, according to this agreement, it was the responsibility of the unit being moved to "load, tie-down and unload (except in flight) accompanying supplies and equipment into and from aircraft." Eighteenth Air Force found that in this exercise some Army units were not capable of loading, tying down, and securing their equipment in accordance with this provision of the agreement. The Eighteenth recommended, therefore, that Army training for all units stress this provision and that this provision be amended to make the tying down and securing of loads that are to be airdropped an Air Force rather than an Army function because of the flying safety hazard involved.[57]

Eighteenth Air Force found also that Air Force units were poorly prepared for air movement. Unit moves during TACAIR 54-7 indicated that little emphasis had been put on air movement tables and unit mobility plans. These were matters that needed to be stressed by operations and transportation people and needed to be reviewed and checked by actual unit movements until an acceptable state of mobility was attained.[58]

Aeromedical Evacuation

Aeromedical evacuation, which was performed by the 1st Aeromedical Group and was under the overall supervision of the USAF Tactical Medical Center, was generally effective. The tactical aeromedical evacuation system provided adequate service within the exercise area, and troop-carrier aeromedical personnel received satisfactory training in intratheater evacuation of casualties.[59]

Eighteenth Air Force staff surgeon was especially well pleased with two aspects of aeromedical evacuation--communications and the overall organization of the aeromedical evacuation system. Since 1951, when the aeromedical program was set up at Eighteenth Air Force headquarters, aeromedical personnel had taken the position that unless the regular tactical communication facilities used for aircraft direction were made readily available on a priority basis, the aeromedical evacuation system should have its own communication facilities. In TACAIR 54-7 tactical communication facilities were available on a priority basis to aeromedical evacuation system representatives at all command echelons. The availability of long-range communication in particular permitted the control of the evacuation system to emanate from the same central direction point from which aircraft

*See above, pp. 90-91.

were controlled, and it was possible to bring patients, medical attendants, and aircraft together quickly and with little wasted motion. Short-range and local communications, especially in areas close to the enemy, still needed improvement, and the staff surgeon recommended that until other agencies or units could improve these facilities, elements of the aeromedical evacuation system be allowed to retain their own limited communication capability.[60]

The staff surgeon also took special note of the organization of the aeromedical evacuation system. In Exercises SNOW FALL and LONG HORN this system was responsible for both intra-theater aeromedical evacuation and wing-base medical service. Inadvertently in Exercises SOUTHERN PINE and COLD SPOT the aeromedical evacuation force was not obliged to furnish wing-base medical service. These two functions were also divorced in TACAIR 54-7. Here, for the first time in a training exercise in which Eighteenth Air Force participated, these functions were deliberately kept separate. The result, according to the staff surgeon, was a gain in operational efficiency for the aeromedical evacuation system and for the wing medical facilities as well, a gain that was deemed great enough "to warrant a permanent change in current organizations and operating procedures."[61]

Exercise TACAIR 54-7 also revealed weaknesses in the aeromedical evacuation system. The USAF Tactical Medical Center had difficulty training the numerous augmentation personnel assigned for the period of the exercise, and the center found that its heavy, bulky World War II type of field equipment was poorly suited for transport by air.[62]

A more serious difficulty was the failure of the Army to provide a sufficient number of simulated casualties to give the aeromedical evacuation system a thorough workout, a failure that brought an abrupt halt to the simulated play on A plus 4, five days before the exercise ended. The USAF Tactical Medical Center, while noting that the small number of simulated casualties had an adverse effect on training, observed that the number furnished was in accordance with a premaneuver agreement.[63]

The Eighteenth Air Force final report, which goes into this matter in some detail, gives an entirely different version. According to this report, the Army and the Air Force reached a gentlemen's agreement—one which the Army put in writing shortly before the exercise began—that the Army would furnish approximately 75 simulated casualties each day, beginning on A plus 1 and continuing through A plus 6. In order to save training time for Army personnel who were to act as casualties, the Air Force agreed to airlift them back to the objective area within four to five hours after they were evacuated.[64]

The Army, however, failed to live up to its side of the bargain. By A plus 3 the Army had furnished only 54 simulated casualties, a number far short of the 225 that had been anticipated. This shortage of "bodies" resulted in gross waste of aeromedical personnel and facilities. Therefore, the Eighteenth Air Force commander notified the FLASH BURN maneuver director that although the Air Force would continue to evacuate actual sick and injured personnel until the link-up of paratroops and ground forces, no requests for the evacuation of simulated casualties would be accepted after 2200 hours on A plus 4. Between A plus 1 and A plus 4 the Army provided 92 simulated casualties instead of the 300 that had been expected, and as soon as simulated evacuation ended, the Air Force began to reduce the size of the aeromedical evacuation system and divert personnel to more profitable training activity.[65]

The Army's final report on FLASH BURN contained no reference to this problem. There was, however, some evidence of Army dissatisfaction with the operation of the Air Force aeromedical evacuation system. The XVIII Airborne Corps G-4 section concluded that Air Force aeromedical evacuation units duplicated Army medical installations and recommended that these Air Force units be eliminated from an airhead. In a separate recommendation this section also proposed that Air Force liaison personnel equipped with radios be attached to Army medical units in the airhead to coordinate air evacuation.[66] The G-4 section, while it was evidently willing to allow the Air Force to provide aircraft for casualty evacuation, was advocating the elimination of all other Air Force aeromedical evacuation functions in an airhead, except those performed by a few liaison officers.

Transport Movement Control System

No discussion of troop-carrier operations in TACAIR 54-7 would be complete without mentioning the transport movement control system. During preparations for the exercise, Eighteenth Air Force decided that the operations control center, a part of the deputy chief of operations shop, lacked sufficient communication facilities to control Eighteenth Air Force units participating in the exercise. The solution was to increase the operations control center with men and equipment and establish it as a transport movement control division. During the exercise this division, which was located at Eighteenth Air Force headquarters at Donaldson AFB and was linked by a communication net with movement control centers at the various maneuver airfields, acted as a centralized control and coordination agency for all troop-carrier activities.[67]

The exercise final report indicated that this arrangement, by providing effective control of large numbers of aircraft performing diverse tasks and operating from widely dispersed airfields, added flexibility to planning and operations. Eighteenth Air Force considered the experiment so successful that it decided to establish permanently a transport movement control center at Donaldson and subordinate movement control centers in the troop-carrier wings.[68]

Troop Carrier Air Force-Tactical Air Force Liaison

Good coordination between the troop-carrier air force and the tactical air force was achieved by establishing in the Ninth Air Force JOC a troop-carrier liaison section composed of pilots from Eighteenth Air Force. In most previous exercises the troop-carrier force had no representation in the JOC. The placing of troop-carrier liaison officers in the JOC in TACAIR 54-7 proved to be highly successful, and Eighteenth Air Force recommended that this practice be followed in all future exercises involving large-scale troop-carrier operations.[69]

Intelligence

In the field of intelligence there were few important deficiencies. Eighteenth Air Force reports mentioned no major difficulties, and Ninth Air Force found that its procedures and directives relating to combat intelligence were adequately tested and were basically sound and workable.* One problem, although it did not seriously affect TACAIR 54-7 but definitely needed a solution, was the use by the Army and Air Force of different grid reference systems on their maps and charts. The Army used the Universal Transverse Mercator (UTM) system and the Air Force the Geographical Reference (Georef) system. The Army's ground maps had no Georef overprint, and only one Air Force aeronautical chart had a UTM overprint, and this was a very large-scale chart that covered only the Third Field Army ground maneuver area. For operations in support of Third Field Army the Air Force had to use the UTM system, and for all other operations—operations outside the Third Field Army area—it used the Georef system.[70]

The use of two sets of maps, the transposing of one grid system to the other and the need for familiarity with two grid systems, increased the possibility of error. These practices would not have been necessary if the two services had used a single grid system. What was needed was a joint agreement on this matter. Ninth Air Force recommended that aeronautical charts with UTM overprints be furnished Air Force units taking part in joint operations, until such an agreement could be reached.[71]

Communications

Intimately related to all Air Force operations in TACAIR 54-7 were activities in the field of communications. As in previous exercises, there was no dearth of findings. Taken in sum, Air Force communications were adequate, and although several difficulties were experienced early in the exer-

*For intelligence findings in the field of atomic weapons operations, see below, p. 123.

cise, these were gradually reduced, and by the end of the exercise all communication systems were working effectively.[72] This, however, is an overall evaluation, and it takes very little probing to uncover incidents of specific communication failures.

Point-to-point communication was handicapped by a lack of sufficient radio channels. The number of FM voice channels available to the JOC, the tactical units, Ninth Air Force headquarters, and the exercise bases were not adequate to handle the traffic load during peak periods, and because of an equipment shortage additional channels could not be installed. Radio relay systems equipped with four-channel carrier equipment did not provide sufficient voice channels for tactical air force operations and administration. To correct this deficiency, Ninth Air Force recommended that the communications group supporting a tactical air force be equipped with 12-channel carrier equipment and the compatible radio relay system.[73]

The functioning of the radio relay system was hampered by Air Force and Army use of the AN/TRC-8 VHF radio as part of the relay system. Only a limited number of frequencies were available, and during the early part of the exercise there was severe frequency congestion. This difficulty was alleviated later in the exercise by the establishment of a joint frequency control panel. This problem was expected to be less acute in the future since the Army was beginning to change over from the AN/TRC-8 to the AN/TRC-24.[74]

There were also a number of communication shortcomings in the operation of the tactical air control system. Heavy traffic on the UHF channels used by pilots for reporting in and out to the TACC and TADC prompted Ninth Air Force to stress the importance of reducing the amount of information passed by pilots to the elements of the tactical air control system. In order to eliminate the long and repeated transmissions that overload radio channels, the Ninth recommended that pilots adhere to standard voice procedures and that only information necessary to the mission be transmitted.[75]

Several problems arose in connection with the operation of tactical air control system radar facilities. These facilities reported an excessive number of unidentified tracks on their radarscopes. The principal cause was the lack of flight plan information on aircraft flying in and through the exercise area. Although the 507th Tactical Control Group had approximately 800 square miles of this area under radar surveillance, it had little movement-of-aircraft information; only during marginal or instrument flight rules weather conditions did it have any such information and this was available only during troop-carrier operations.[76]

The identification problem was further complicated by deficiencies in the use of airborne Mark X identification, friend or foe (IFF) equipment. Some pilots were not familiar with the Ninth Air Force communications and electronics instructions supplement that prescribed the procedures for operating IFF equipment, and some pilots had not been thoroughly checked out in its use. Troop-carrier aircraft participating in the exercise were not directed to use IFF, an omission that prompted the Ninth to recommend that in future exercises all aircraft be equipped with and operate Mark X IFF equipment.[77]

An additional bar to the effective operation of the tactical air control system was the excessive delay between the time a target appeared on the radarscopes of the L/W radar facilities and the time this information was displayed on the plotting boards at the TADC and TACC. In order to maintain proper control of high-speed aircraft, this time would have to be reduced.[78]

An item of special interest in the field of radar was the testing at North Auxiliary Airfield during the exercise of a newly developed lightweight ground-controlled approach unit called super-precision approach radar (SPAR). During the period from 20 April to 8 May 633 approaches were carried out with F-86's, and additional runs were made by T-33, C-119, C-124, and C-45 aircraft. Although the tests were run under visual flight rules conditions, pilot reports were favorable. It was learned that the F-86 presented an easily discernible target at a distance of seven miles and that UHF communication with the aircraft did not fade at any time during the approach. Of particular interest to Ninth Air Force was the mobility of the unit and its use of simplified procedures for handling high-speed traffic rapidly. However, it was believed that further operational suitability tests would have to be made before a final verdict on this equipment could be reached.[79]

Following Exercise TACAIR 54-7 there was criticism of the radio equipment used by the forward air controllers (FAC) to control air strikes. On 1 January 1954 the Army took over from the Air Force the responsibility for supplying communication equipment for the FAC's, and TACAIR 54-7 was the first test of this new arrangement. From the Air Force viewpoint it was hardly an auspicious beginning. In the first place, there was a shortage of AN/MRC-20's, the primary FAC radio, caused by the Army's use of this set in its air-request net.* In the second place, the Army-supplied FAC radios were not properly channelized, even though the Ninth Air Force frequency plan, which specified the channels and frequencies to be used with the FAC radios, had been presented to XVIII Airborne Corps approximately six weeks before the exercise began. No air-to-ground or ground-to-air radio checks were made before the exercise, checks that would have revealed discrepancies in channelization.[80]

To prevent a recurrence of this channelization difficulty, Ninth Air Force suggested that operating units take steps to insure that their forward air controllers were thoroughly briefed on the air-ground frequency plan. The Ninth believed that the Air Force should request the Army to modify permanently the AN/MRC-20's AN/ARC-27 component on a frequency compatible with Air Force aircraft.[81]

Both the Air Force and the Army were dissatisfied with the FAC radio equipment itself. In addition to the AN/MRC-20, the Army supplied the FAC's with two pack sets—the AN/TRC-7 and the Navy May set. In the opinion of XVIII Airborne Corps both of the pack sets had proved inadequate for combat use. The AN/MRC-20, the long-awaited replacement for the old AN/VRC-1 that had given so much trouble in previous exercises, provided no final answer to FAC communication problems. XVIII Airborne Corps considered it to be superior to the pack sets, but the G-3 section of FLASH BURN headquarters reported that the set was inadequate and recommended that efforts be continued to develop a reliable, durable, lightweight FAC radio.[82]

Further criticism of the AN/MRC-20 came from the 82d Airborne Division and Ninth Air Force. The 82d Airborne recommended that the Army develop as a replacement for the AN/MRC-20 a more rugged radio that could be dropped by the heavy-drop method. The chief complaint by Ninth Air Force was that the AN/MRC-20's antenna was too rigid. A number of antennas broke because of their rigidity, and to prevent this from happening, when the vehicle carrying the radio was moved, the antenna had to be dismounted. But then the set could not transmit or receive during the movement. Also contributing to the communication problem, according to the Ninth, was the lack of knowledge of the AN/MRC-20 on the part of Army communication personnel.[83]

Army radio operators were apparently not trained to operate the AN/GRC-26 radio used in the Army air-request net. The FLASH BURN final report states that although the AN/GRC-26 was an excellent radio for this net, its complexity made it necessary to use highly skilled, fully trained operators. During the exercise the lack of qualified operators was a real handicap as far as the Army's air-ground operations system communications were concerned.[84] The 82d Airborne Division criticized the radio itself on the grounds that it could not be adapted for delivery by parachute or assault aircraft and had to be moved administratively to the airhead.[85]

Airborne Electronic Warfare Operations

A special feature of communication activities in Exercise TACAIR 54-7 was the conduct of airborne electronic warfare (EW) operations by the 9th Tactical Reconnaissance Squadron. During the exercise this squadron engaged in EW reconnaissance, which consisted of ferret and hunter-killer sorties flown for the purpose of locating and destroying radar installations, and carried out jamming sorties against radars and communication channels.

The EW reconnaissance missions performed during the exercise revealed that under simulated combat conditions RB-26 ferret aircraft of the type assigned to the 9th Squadron could locate radar installations in a given area and keep them under surveillance. Hunter-killer and/or homing tactics

*See above, p. 112.

used during the exercise to locate and destroy radar installations promised to be an important part of future EW operations. It was determined also, as the result of successful EW operations against the guidance radars of the Army's Corporal missile, that guided missile control radars were susceptible to interception, analysis, location, and destruction by EW ferret aircraft within the time period required by the missile unit to prepare the missile for launching. These guidance radars were especially vulnerable because of their long warm-up period.[86]

The jamming operations conducted by the 9th Squadron indicated that 100-percent effectiveness in the jamming of radar equipment was hard to achieve; better results were obtained by using jamming for confusion and/or deception. Early-warning and ground-control interception communications, as well as other air-ground and ground point-to-point communications, proved highly suceptible to jamming. There were indications also that radar operators affected by communication jamming were not well trained in countermeasures. In one instance, for example, anti-jamming measures used by ground radar operators did more to decrease their radar's effectiveness than the jamming they were trying to combat.[87]

In light of these various findings the EW report for TACAIR 54-7 recommended that 1) hunter-killer tactics and techniques be further developed in order to increase their effectiveness, 2) the long warmup period for missile radars be reduced, 3) training of radar and radio operators in anti-jamming methods be intensified, 4) a joint EW committee be organized to control the conduct of EW operations in future maneuvers, and 5) an EW division be included in the JOC.[88]

Atomic Weapons Operations

Extensive atomic weapons operations in TACAIR 54-7 produced several significant findings. Training in the tactical employment of atomic weapons was hampered by a number of factors—by lack of realism in procedures for mounting an atomic strike, by insufficiently trained JOC personnel, and by deficiencies in intelligence. According to the normal procedure for conducting atomic strikes, the tactical air force prepared target computations, selected the bomb, and requested authority from the theater air commander to expend it. If the theater air commander approved the strike, he notified the tactical depot squadron to prepare the bomb for delivery and instructed a troop-carrier unit to pick up the bomb and deliver it to the strike unit. The latter unit checked the bomb and loaded it on an aircraft. After taking off, the aircraft reported to the TACC, which exercised control of the aircraft enroute to the target.[89]

In TACAIR 54-7 there was no actual test of this procedure. It was assumed that the atomic bombs had been pre-positioned at the strike bases, and the tactical depot squadron and troop-carrier unit were not actually brought into the play. Action by these units was simulated, and there was no test of their ability to furnish timely logistical and airlift support in a situation where bombs were not pre-positioned or where they were being expended at a rapid rate. The steps in the procedure for carrying out atomic strikes had been tested separately or individually prior to TACAIR 54-7. What was lacking in this exercise, and was suggested by Ninth Air Force for inclusion in some future exercise, was the testing of the entire procedure that a theater force would follow in conducting an atomic strike. A test of the complete action, the Ninth believed, would reveal the time required for each step as well as for the entire operation. To add realism to the test, the Ninth suggested that stockpile rather than pre-positioned bombs be used and that the strike units be located at various airfields 200 or more miles from the tactical depot squadron.[90]

Another lesson learned from the atomic play in TACAIR 54-7 was that the JOC was capable of handling the employment of atomic as well as conventional weapons. Ninth Air Force JOC procedures for conducting atomic operations proved to be adequate. According to the Ninth's report on the atomic play, however, Air Force personnel in the JOC had little or no knowledge of the part they were to play in atomic strikes or of the action required of them when a strike was in progress. To correct this deficiency, the Ninth recommended that they be given atomic training along with the specialized training applicable to their career fields.[91]

This same criticism applied also to army personnel in the JOC. Throughout the atomic play it was evident that the G-2 and G-3 air officers and their staffs had not received any instruction in the

capabilities, effects, and employment of atomic munitions. The opposite was true for the officers who handled the atomic play at Third Field Army headquarters. These officers from a technical standpoint were well trained in atomic operations, but they had little or no knowledge of the procedures followed in the JOC.[92]

Intelligence activities connected with the atomic play were also criticized. In the Ninth Air Force directorate of intelligence there were few individuals trained in the various intelligence functions involved in atomic warfare operations and the development of target intelligence especially was handicapped for this reason. When TACAIR 54-7 was conducted, only one officer in the Ninth's directorate of intelligence had completed the Air Weapons Course at the Air University. It was impossible for the directorate to man adequately a target vulnerability and weapons recommendation section in its target intelligence branch. The answer, as stated in the intelligence report, was to establish such a section within the directorate of intelligence and require everyone connected with it to attend the Air Weapons Course.[93]

There was a marked absence of realism in the intelligence procedures that were followed in connection with Army requests for atomic strikes. Intelligence data for these strikes was provided by Army umpires and was based on simulated Aggressor units and Aggressor movements. This data was furnished by the Army without any prior coordination with Air Force intelligence, and the Air Force remained uninformed until the Army submitted its requests. In combat this would not be the case. Intelligence data submitted by the Army would be obtained largely from Air Force sources, from photo reconnaissance and from pilots' spot reports. Since photographs are distributed to both services and spot reports are given to both the G-2 air officer and the A-2 officer, intelligence information pertaining to an atomic strike would be in the hands of both services at approximately the same time. The Ninth Air Force thought this procedure could have been followed and realism increased if there had been a joint maneuver headquarters and a joint umpire headquarters.[94]

In the Army's report on the atomic play in FLASH BURN there were two comments of special interest to the Air Force. In the first place, the Army was critical of the Air Force's requirement that before the Army could fire an atomic weapon it had to give the Air Force two hours to clear its aircraft from the strike area. To accept this requirement, the Army insisted, would be to negate one of the main advantages of the 280-mm. atomic artillery piece—its ability to strike at fleeting targets or targets of opportunity. These targets, of course, might well disappear during the time required by the Air Force to vacate the strike area.[95]

In the second place, the Army only grudgingly accepted the fact that the Air Force needed two hours' notice in order to deliver an atomic strike in support of the Army. Actually, the Army was interested in speeding up the delivery of these strikes. Under certain circumstances, Ninth Air Force reported, it would be possible to do so. If an aircraft with an atomic bomb aboard and with its crew ready were kept on runway alert, only a one-hour notice would be required from the Army. Such a procedure, it seemed to the Ninth, would be feasible if the Army were carrying out a large-scale advance or withdrawal and called for an atomic strike against an area target such as large enemy reserve forces. Targets of this sort were not likely to be precisely located, and therefore elaborate and time-consuming target computations would probably not be required. With only a one-hour notice, and using a large-yield weapon, a strike carried out by aircraft that had been held on runway alert could prevent the buildup of sizeable enemy reserve forces.[96]

CHAPTER XI

SUMMARY AND CONCLUSION

For each of the five training exercises considered in this study the treatment has included first, in narrative form, a discussion of the planning, organization, and play of the maneuver and then, against this background, a detailed analysis of the results or findings. This analysis has covered a multitude of items; it has revealed weaknesses in planning and organizational structure and deficiencies in virtually every aspect of tactical air operations. At the same time an effort has been made to include positive as well as negative criticism, to stress accomplishments as well as failures, and where mistakes were made to indicate why they were made and how they could have been avoided.

It remains to summarize those findings that have a special significance because of their appearance in several or in all of these exercises. Joint planning, in Exercises SOUTHERN PINE and LONG HORN especially, was hampered by the delay in manning Air Force positions on the joint maneuver staff and by the assignment of inexperienced personnel to these posts. The use of inexperienced personnel was perhaps justified, since one of the purposes of these exercises was to provide training in joint staff planning. But their use and the late arrival of Air Force officers slated for duty on the joint staff made it difficult for the Air Force to secure a maneuver concept that was consistent with Air Force doctrine and that would facilitate the achievement of Air Force training objectives. This point is well illustrated in the findings for Exercise LONG HORN. Even before the first joint planning conference the Army, working unilaterally, had formulated a detailed concept for the maneuver, a concept that stressed limited ground objectives and tended to ignore broad theater objectives that would have brought theater air forces fully into the play. After the formation of the joint maneuver staff this Army concept could have been modified and made more compatible with Air Force views. But this opportunity was lost when the Air Force delayed for over two months the full manning of its joint staff positions. The Army, on the other hand, filled its positions promptly and dominated the joint planning.

From the very inception of joint exercises and before the joint staff is established, the services should share equally in the planning and in the development of the maneuver concept. To Ninth Air Force it seemed that the best way to insure early and continuous joint planning was to set up a joint planning group at Tactical Air Command-Army Field Forces level. This group would plan all joint field exercises, publish the general plan, and clarify or delete controversial matters. For major exercises the group would move into the field and serve as the maneuver director's staff.

Air Force planning, as distinguished from joint planning, in these exercises was most frequently criticized for the delays that occurred in the publication and delivery of the general plans and the Ninth and Eighteenth Air Force operation plans. These delays hampered planning by subordinate units. A salutary effect of such tardiness was that it gave these units experience in planning on short notice from higher headquarters, a circumstance they were quite likely to encounter in combat. However, the late arrival of plans worked a hardship on reconnaissance units, whose operations usually began early in the exercise, and on communication units, which needed to know at an early date the detailed concept of operations in order to insure that Air Force and Army communications were compatible.

Balancing these shortcomings were certain solid accomplishments by Air Force planners. In SOUTHERN PINE the careful preparation of operation orders and administrative plans by Ninth Air Force, Troop Carrier Command, and Aggressor air headquarters insured that there were no supply breakdowns during the exercise; and in TACAIR 54-7 sound planning by Ninth Air Force greatly reduced logistic difficulties. Especially efficient was the Ninth's operation planning for LONG HORN.

All five of the exercises considered in this study were marked by discrepancies in or conflicts over organization and command structure. Three of the exercises—SOUTHERN PINE, SNOW FALL, and LONG HORN—were joint exercises, and two—COLD SPOT and TACAIR 54-7—were unilateral Air Force exercises held in conjunction with Army Exercises SNOW STORM and FLASH BURN respectively. For two of the joint exercises—SOUTHERN PINE and LONG HORN—the organizational structure, on the surface at least, appeared to be sound, with a numbered air force and a field army operating as co-equal components in a theater operation. In actual practice, however, Ninth Air Force, the numbered tactical air force in both of these exercises, operated with a single army corps, which was subordinate to the field army. In SOUTHERN PINE Third Field Army did not take the field, and the Ninth, for all practical purposes, worked with VII Corps. In LONG HORN Fourth Field Army was composed of one actual corps, the XVth, and two paper corps. Fourth Field Army virtually ignored the simulated corps, and as a result the Ninth operated almost entirely in support of XV Corps. In both exercises the impression was created that a numbered air force normally supports an army corps rather than a field army.

In LONG HORN the field army was not a fully manned and separate headquarters. Planning for Fourth Field Army was performed by Army members of the joint theater staff, and Fourth Field Army was commanded by the deputy theater commander (Army). This situation, in a sense, put Fourth Field Army at a higher command level than its opposite number, Ninth Air Force. To preserve the doctrine of co-equality of theater ground and air forces, the theater Army commander and staff should have been completely separated from the Army's operating or field army headquarters.

The command structure for the third joint exercise—SNOW FALL—is open to question because of the use of a joint task force. Originally, the Army planned to establish a joint task force, which was to be commanded by the 11th Airborne Division commander and staffed, on the Army side, by the 11th Airborne staff. This force was to include a troop-carrier division and a tactical air division. Tactical Air Command objected on the ground that the SNOW FALL type of operation could best be conducted not by a joint task force but by a normal theater organization. The underlying principle here, so far as the Air Force was concerned, was that in most circumstances theater air forces should be kept intact and should not be dissipated by parceling them out to a subordinate theater element such as a joint task force.

In SNOW FALL the joint task force question was settled by a compromise. The joint task force structure was retained, but to make it somewhat more palatable to the Air Force, the task force was removed from what amounted to division control and organized at a higher level. The maneuver director was named commander, and the Army portion of the joint task force staff was drawn not from the 11th Airborne Division but from the Army members of the joint maneuver staff. The troop-carrier division and the tactical air division were commanded directly by the commander of Air Force Forces, which was a component of the joint task force and was co-equal with the Army Forces. In agreeing to the establishment of a joint task force the Air Force did some violence to its doctrinal views, but it did secure within this task force a command structure that preserved the principles of unity of command and co-equality of ground and air forces.*

There was also disagreement over the organization for the unilateral exercises, COLD SPOT-SNOW STORM and FLASH BURN-TACAIR 54-7. Taking the position that these should have been joint exercises, the Army claimed that the planning and execution of joint operations would have gone more smoothly if there had been a joint maneuver commander and a jointly staffed maneuver headquarters. In the case of COLD SPOT-SNOW STORM, Tactical Air Command reached an opposite conclusion, arguing that in small-scale exercises of this type there was no need for a joint headquarters and that the concept of jointly phased unilateral exercises had proved to be sound and economical. After FLASH BURN-TACAIR 54-7 the Air Force was somewhat less vigorous in its support of the unilateral type of organization, and there seems to have been some feeling that these exercises, because of their size and scope, should have been conducted as a single joint exercise.

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*The Army and the Air Force also disagreed over the use of a joint task force for airborne operations. See below, pp. 128-29.

In the case of small-scale exercises, however, Tactical Air Command remained firmly convinced of the efficacy of the unilateral organization. Previous joint exercises, particularly the smaller ones, had not fully satisfied Air Force training and testing requirements. Usually these exercises were based on a ground or surface concept, which restricted the Air Force to operations in support of the Army in a relatively small maneuver area and failed to exploit in realistic fashion the broad, theater-wide capabilities of tactical and troop-carrier air forces. In a unilateral exercise the Air Force could support the Army and at the same time carry on operations calculated to give its units experience in the proper employment of theater air forces.

This expectation was realized to some extent during COLD SPOT, when Air Force units engaged in a separate exercise known as Operation SAMPSON. After TACAIR 54-7, however, Ninth Air Force complained that despite the use of a unilateral organization the concept of the exercise was essentially narrow, with Air Force operations being geared almost entirely to the support of Army forces engaged in Exercise FLASH BURN.

This experience indicated that the unilateral organization did not automatically produce a maneuver concept that was conducive to sound, realistic Air Force training. This concept must be constructed by careful planning and, where there are to be joint operations, by close and continuous coordination with Army planners.

The conduct of joint operations during unilateral exercises, it should be emphasized, calls for close association between the Air Force and Army during both the planning and the execution phases. Despite their emphasis on the advantages of the unilateral type of exercise, Air Force reports on both COLD SPOT and TACAIR 54-7 recognized that there should be joint planning and control of the joint aspects of such exercises; and Ninth Air Force, after TACAIR 54-7, renewed a suggestion it had made after LONG HORN—that to plan and control joint exercises or unilateral exercises of the FLASH BURN-TACAIR 54-7 type, a joint planning group be formed at Tactical Air Command-Army Field Forces level.

In unilateral exercises joint action and close cooperation should be encouraged not only in the planning and operational phases but also during the critiques. Although the Air Force played an important part in the three regimental combat team exercises conducted during Army Exercise SNOW STORM, there was no Air Force representation at the critiques, and there was no indication that Army officers took part in the COLD SPOT critiques. The top Air Force commanders of TACAIR 54-7 attended the FLASH BURN critique but did not participate in it; and, seemingly, there was no Army participation in the Ninth and Eighteenth Air Force critiques that followed TACAIR 54-7. Failure to arrange for reciprocal attendance at each other's critiques may have been an oversight, or it may have resulted from an overemphasis on the unilateral aspect of these exercises. Whatever the reason, it was unfortunate that there was no opportunity for an interchange of views on problems and findings of mutual interest and concern.

The operational phase of each of the five exercises produced important results in a number of fields of Air Force activity—reconnaissance, close support, troop-carrier operations, and communications. In each field certain problems appeared time after time. Tactical reconnaissance operations were beset with a myriad of shortcomings. Most in evidence were delays in the processing and delivery of aerial photos and reconnaissance information, the Army's lack of understanding of the capabilities and limitations of aerial reconnaissance, difficulties in the field of night reconnaissance, and the inefficiency of the joint air photo center.

Still, there were achievements deserving recognition. Reconnaissance in the last two exercises—COLD SPOT and TACAIR 54-7—was considerably more effective than it had been during the earlier exercises. Excessive delay in the procurement, processing, and delivery of aerial photos was the most troublesome of all reconnaissance problems encountered in these exercises. COLD SPOT was the lone exception. In this case, delays were reduced by the Army's effective supervision of its reconnaissance requests and by the good communication and transportation facilities linking the reconnaissance airfield and the Army maneuver headquarters. The outstanding accomplishment of the reconnaissance effort in TACAIR 54-7 was the establishment of an effective joint air photo center.

None of the exercises tested the effects of nuclear warfare on the reconnaissance system. Yet the dispersion of Army and Air Force facilities and units, necessary as a protection against nuclear attacks, is certain to complicate the already difficult problem of rapid processing and delivery of aerial photos. It is extremely doubtful whether the Services can any longer afford to concentrate their sizable and expensive processing facilities in a single joint air photo center, and the delivery of photos to even more widely scattered units certainly calls for a drastic revision of a delivery system that has been far from satisfactory even when units have been located fairly close together. The decentralization of joint air photo center facilities would seem to be essential, and there is a need to develop a new method of delivering photos.

The most common complaints concerning close support in these exercises were the Army's lack of understanding of the principles and procedures governing air operations, the ineffectiveness of the air-request nets, and TACP deficiencies. Ground commanders from corps down did not plan carefully the use of available air support. It was hard to get them to submit preplanned requests, and frequently they requested air strikes on targets that could best have been attacked by artillery. There was considerable evidence that ground officers were ignorant of the proper methods for requesting air strikes, and in only a few cases did the Army assign experienced people to the air-ground operations section of the JOC. Certainly these inadequacies offered abundant proof that the Air Force, through such media as its Air-Ground Operations School and Joint Air-Ground Instruction Teams, needed to intensify its efforts to indoctrinate Army personnel concerning their responsibilities in close-support operations.

Adding to the Army's difficulties in this area was the absence in most of these exercises of a workable air-request net, particularly within the infantry divisions. The breakdown or overloading of this net made it impossible to get requests through quickly and led in a number of instances to the practice of forwarding strike requests over the control communications of Air Force TACP's and mosquito aircraft. Air-request net deficiencies hampered close-support operations in almost every exercise held since the end of World War II. Even when the net was working well the forwarding of requests through the various ground echelons was a slow and cumbersome procedure. In this connection it might be worthwhile for the Air Force and the Army to explore the possibility of eliminating the Army air-request net and using Air Force TACP and mosquito aircraft communications for forwarding requests.

This procedure is used by the Marines; it is sanctioned by the Joint Training Directive for the early stages of airborne operations; and, as has just been pointed out, it has been employed again and again in training exercises when the present air-request system has broken down. The Air Force favors using the Army air-request system because it allows ground commanders at each echelon to control and supervise the requests. This is also possible to some degree in the Marine system, in which representatives of the ground commander monitor and can disapprove requests sent forward by the TACP's. This system, perhaps modified to insure tighter control over requests, offers a solution to this long-standing problem.

Difficulties encountered by the TACP's were due largely to the use of inadequate radio equipment and wornout vehicles. Except in COLD SPOT the old AN/VRC-1 radios proved unsatisfactory, as did the World War II jeeps upon which they were mounted. Tests of a new TACP radio—the AN/MRC-20—were conducted in LONG HORN and TACAIR 54-7, but the results were inconclusive.*

In Exercises COLD SPOT and TACAIR 54-7 the H-19 helicopter was tested as a TACP vehicle. When it was used as an elevated platform from which air strikes were controlled, the H-19 afforded excellent visibility for the controller and greatly enhanced his ability to recognize and describe targets. But there were serious misgivings about the helicopter's vulnerability to hostile fire. There was a possibility that other helicopter types, such as the H-13 or H-22, would be less susceptible to enemy ground fire and air attack, but the vulnerability problem remains as a serious drawback to the use of the helicopter as a control platform.

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*See below, p. 130.

The most promising aspect of this test was the use of the helicopter to transport TACP's to points on the ground from which they could control air strikes. In speed and mobility the helicopter is, of course, superior to a ground vehicle. By using the helicopter for transportation one TACP can do the work of several, and the number of TACP's needed by the ground forces can be substantially reduced. Frequently the Army has claimed that 13 TACP's should be assigned to each infantry division. The Air Force, partly because of the drain such a demand would place on its fighter pilot strength and partly for doctrinal reasons, has countered with the argument that TACP's should be assigned by the air commander in the numbers he considers necessary in light of the demands of the overall tactical situation.

In these exercises the use of mosquito aircraft to control close-support strikes met with only indifferent success. The T-6 and the F-51 were considered to be too vulnerable to air attack. The RF-80 had in its favor maneuverability, speed, and excellent visibility for the pilot-controller. However, because of the high rate of fuel consumption of this single-place aircraft, its pilot—who must at the same time fly, observe, and control—normally had time to locate only one target and control a strike against it. One reconnaissance unit feared that the RF-80 would be vulnerable in combat because it could not accelerate rapidly after slowing down for observation and for the control of strikes.

Troop-carrier operations were generally well conducted. In most cases personnel drops were accurate and on schedule. One of the M-day drops in Exercise LONG HORN, despite the fact that all personnel landed on the DZ, indicated the need for more practice in formation flying. This operation also lacked realism; troop-carrier aircraft flew a course that was in range of much of the enemy's artillery, and the DZ was located within range of a number of enemy artillery battalions. Realism was unavoidably lost in COLD SPOT, when high winds and the frozen condition of the DZ forced the cancellation of all but a few of the drops. Realism was again lost in TACAIR 54-7; because of the size, shape, and location of the DZ's, the assault elements of the 82d Airborne Division could not be dropped simultaneously, and the use of only one airfield in the assault area made it difficult to conduct realistic airlanding operations. There is little evidence, even in the last of these exercises—TACAIR 54-7—that those responsible for the planning took fully into consideration the effects of nuclear warfare on airborne operations.* Even as late as 1954 there was no serious effort to test concepts for airborne operations in a nuclear war—concepts that would involve such measures as greater dispersal, small formations, and the use of multiple routes into multiple DZ's and LZ's.

Drops of equipment and supplies by the heavy-drop method were in the main satisfactory. In most of the exercises there were several malfunctions of the equipment used for making heavy drops. From the experience of LONG HORN it was evident that there was a need for replacing the Army's 6,000-pound load-bearing platform and a need for redesigning the extractor bar, the shot pack and ejection parachute, and the trigger mechanism for release of loads. Heavy-drop equipment was still inadequate in the last of these exercises—TACAIR 54-7. Malfunctions in this exercise led to the recommendation that an improved heavy-drop system be developed for the C-119, a system that would provide for the instantaneous release and ejection of heavy-drop loads.

In all of the exercises, troop-carrier operations were marked by interservice controversy. Most in evidence were disputes over command structure, aeromedical evacuation, and aerial port operations. The command structure disagreement was focused on the question whether or not a joint task force should be established for the conduct of airborne operations. Army airborne commanders favored the joint task force structure, arguing that such a force, with its joint commander and staff, could best insure the close coordination and control of troop-carrier and airborne forces necessary to the success of large-scale airborne operations. Tactical Air Command's position on this matter was that the establishment of joint task forces for normal theater operations was neither necessary nor desirable, that normally there was no need for a joint task force at airborne-troop carrier level, and that effective airborne operations could be carried out on a cooperative basis by separate airborne and troop-carrier headquarters located in close proximity.

*See also below, pp. 130-31.

Actually, a joint task force for airborne operations was employed in only one of these exercises–SOUTHERN PINE. In this case it worked well, but the rehearsal, which was held before the joint task force took over, also went off smoothly, and the results of the exercise were inconclusive as far as this problem is concerned. After SNOW FALL, COLD SPOT, and TACAIR 54-7, Army reports, especially those of the airborne units, were sharply critical of the failure to form a joint task force. All in all, these exercises contributed little to the settlement of this dispute. However, it is one that should be resolved before the Army and the Air Force are called on to conduct airborne operations in combat.

The two services were also at odds over responsibility for the air evacuation of casualties. For each of the first three exercises–SOUTHERN PINE, SNOW FALL, and LONG HORN–Army Field Forces and Tactical Air Command reached an agreement or compromise by splitting the responsibility for aeromedical evacuation. In SOUTHERN PINE each service provided aeromedical evacuation for an approximately equal number of U.S. forces combat units, and in SNOW FALL and LONG HORN the Army handled air evacuation from the frontlines to an Army forward medical facility, such as the division clearing station, and the Air Force carried out evacuations from that point back. After the exercises Air Force reports criticized these arrangements on the ground that split responsibility resulted in a costly duplication of facilities and personnel and suggested that a single theater-deep air evacuation system operated by the Air Force would be more efficient than two systems which joined at some intermediate point in the theater. The Air Force was critical of the Army's requirement that its air evacuated casualties, on their way to a point of definitive treatment, pass through every link in the Army evacuation chain. The Air Force had a special reason for dissatisfaction with aeromedical evacuation in LONG HORN, when the maneuver surgeon, evidently in order to keep a full complement of Army personnel at the front, ruled that no simulated casualties would be evacuated beyond the division clearing station, a decision that shut the Air Force out of the simulated play.

The dispute over aeromedical evacuation was seemingly settled in November 1952, when the Secretary of the Air Force and the Secretary of the Army in the Memorandum of Understanding Relating to Army Organic Aviation agreed that within the combat zone air evacuation would be an Army responsibility. Air evacuation from points within the combat zone to points outside and all air evacuation during airborne operations until the link-up of the paratroops and ground units were made Air Force responsibilities. Still, difficulties in this field persisted. In COLD SPOT-SNOW STORM the Army held that a premaneuver agreement, which was based on the memorandum of understanding, did not apply to actual casualties, and the exercise was almost over before the matter was settled to the satisfaction of the Air Force. In FLASH BURN-TACAIR 54-7 the Army fell far short of supplying the agreed upon number of simulated casualties, and as a result the Air Force cut short the simulated play.

Also a matter of interservice controversy was the operation of aerial ports or terminals, particularly the packaging, loading, and in-flight ejection of supplies and equipment. Both the Air Force and the Army claimed responsibilities in this field, and for each of the first three exercises a special agreement was worked out whereby aerial port functions were shared by an Air Force aerial port operations squadron, an Army quartermaster aerial supply company, and a transportation port company. Throughout the period of these exercises, the Air Force, because of aerial port squadron equipment shortages, had little choice but to allow the Army to take over a large share of the aerial port activities.

Service responsibilities relating to the operation of Air Force air terminals were clarified in an agreement reached by the Air Force and Army Chiefs of Staff in January 1953. But neither COLD SPOT-SNOW STORM nor FLASH BURN-TACAIR 54-7, both of which were held after this agreement, was free of difficulties in this field. COLD SPOT-SNOW STORM was marred by a stormy disagreement over a shortage of aircraft floor conveyors and tie-down equipment for heavy-drop operations. After FLASH BURN-TACAIR 54-7, Eighteenth Air Force expressed dissatisfaction with the provision of the January 1953 agreement that for unit moves assigned to the unit being moved the task of tying down and securing aircraft loads. Because some Army units had done a poor

job in this respect and because of the flying safety hazard involved, the Eighteenth recommended that the tying down and securing of loads be made an Air Force responsibility.

Success in training exercises as well as success in combat is largely dependent on effective control, and effective control is impossible without good communications. In these exercises there were numerous communication deficiencies. Air Force communications in SNOW FALL and COLD SPOT were generally satisfactory, but these exercises were by no means free of defects in this field; and if the five exercises are taken as a whole, the record is far from outstanding. Point-to-point radio, teletype, and telephone communications linking the tactical air force headquarters, the JOC, and the operating units were frequently overcrowded, and the exercise reports contain frequent references to the need for more communication equipment and additional circuits. Even of communications, however, there can be too much; and after LONG HORN, Ninth Air Force was apprehensive concerning what it considered to be a proliferation of tactical air force communication facilities. The size and complexity of the LONG HORN communication systems violated the principle that a tactical air force should operate in forward areas on an austerity basis, and the Ninth called for a ruthless elimination of all facilities that interfered with mobility and combat efficiency.

In most of the exercises the effectiveness of the tactical air control system was hampered by radar deficiencies and TACP communication problems. Control system radars often failed to provide adequate low-level coverage and lacked the range and height-finding capabilities needed to control interceptions when high-speed, high-altitude aircraft were involved. This was a situation badly in need of correction, for to tolerate a poor control and warning system in an age of mass-destruction weapons and increasingly rapid and effective means of delivery is to court disaster.

Radar deficiencies of the tactical air control system extended also to the AN/MSQ-1 close-support-control radar used by the TADP's. The set had only a limited range, and operators had trouble locating, locking on, and maintaining contact with aircraft. Skin tracking of fighter-bombers was often poor, and the set was not sufficiently accurate for pinpoint navigation or as an aid in night reconnaissance. Also below par in several of the exercises were Shoran and IFF operations. Several times radar generators failed to function properly.

As brought out above in the discussion of close air support, TACP communications were less than satisfactory. Much of the trouble is attributed to the old AN/VRC-1 radio. The set's SCR-191 HF radio component, used for point-to-point ground communication, was underpowered, lacked range, and was difficult to repair in the field. The SCR-522, the VRC-1's VHF component, used for ground-to-air communication, did not stand up well under rugged field conditions, and its four channels were too few for effective aircraft control. Still, in COLD SPOT the VRC-1 worked fairly well, proving that good maintenance can often offset the shortcomings of old equipment.

The new AN/MRC-20 control party radio, which was field-tested in LONG HORN and used again in TACAIR 54-7, was an improvement over the VRC-1. But the experience of these exercises was hardly conclusive. The LONG HORN test was conducted without sufficient preparation; and in TACAIR 54-7 the Army, which shortly before the exercise began had assumed responsibility for furnishing TACP radios and vehicles, kept most of the MRC-20's at regimental command posts for use in the air-request net, thus depriving the TACP's of their most reliable means of communication and preventing a thorough test of the new equipment. Few Army people were as yet experienced in the operation and maintenance of the MRC-20.

Communication equipment for the Army's air-request net was in the main undependable, particularly the AN/GRC-26 radio. This set had several defects: nighttime static, too few voice channels, insufficient spare parts, faulty operation, and poor maintenance. The GRC-26 was totally unsuited for airborne operation, for it could not be delivered by parachute or by assault aircraft.

In four of the five exercises—COLD SPOT was the lone exception—the Air Force engaged in atomic weapons play. The exercises provided an opportunity for experimentation and improvization in the employment of atomic weapons, but the atomic weapons play fell short in providing sound, realistic training in this field. In none of the exercises did the atomic play sufficiently influence the entire scheme of the maneuver: its effect on the overall concept of each maneuver was not outstanding, and it was not fully integrated into operations plans and unit fire plans. Realism suffered

because of excessive simulations. The atomic play in SOUTHERN PINE was almost entirely simulated, and in LONG HORN all atomic play below the level of Ninth Air Force advance headquarters was simulated except for reconnaissance. In none of the exercises was there an actual test of the entire procedure for delivering an atomic strike, a test that would have shed light on the ability of tactical depot squadrons and troop-carrier units to furnish timely logistical and airlift support. Immediate and evaluated intelligence is a vital aid in locating tactical atomic targets, but the intelligence play in these exercises was handicapped by a shortage of intelligence personnel trained in atomic warfare operations and by a failure to establish effective intelligence procedures.

All five exercises were deficient in the amount of training they provided in joint planning for the use of air-delivered atomic weapons in close support. Only a very few atomic close-support missions were undertaken—and most of them were flown for the Aggressor—probably because the small, widely scattered Aggressor forces presented few atomic targets. But for LONG HORN at least, the Ninth Air Force believed the reason was the disagreement between the Air Force and the Army over control of atomic weapons in a theater of operations. The Air Force held that the control of air-delivered weapons should be exercised solely by the theater commander and that joint planning for the use of such weapons should be carried out at tactical air force-field army level. The Army, according to the Ninth Air Force, wanted to see control of air-delivered weapons delegated to corps commanders, who would also be responsible for the planning. The Army made no provision for joint atomic planning at numbered air force-field army level and sought instead to have it conducted at corps level.

Effective joint planning for using air-delivered weapons in close support was difficult because the Army did not understand what information should be included in a request for such support. In LONG HORN especially and to some extent in TACAIR 54-7, the Army seemed to consider a request for an atomic close-support strike to be a sort of directive that specified bomb yield, burst height, ground zero, type of aircraft, minimum safe altitude, and direction of attack. The Air Force looked on atomic requests as being similar to any other requests for close support. The specifications that the Army sought to include in its atomic strike requests were actually—as with conventional requests—matters that should be determined in the JOC, with the power of final decision resting with the air commander.

From this summary of findings it is apparent that in the training exercises held during the period 1951-1954 certain mistakes were frequently repeated. The problem is how to prevent the errors of one exercise from reappearing in the next. Studies of exercises conducted during the years 1946-1950* dealt with this same problem and made several suggestions that are also pertinent here. Exercise reports should be carefully prepared and should contain full information on deficiencies and recommendations for their correction. Reports should be written promptly, while recollections of the exercise are still fresh; but in setting the deadline for the submission of reports, time should be allowed for a thorough analysis based on all the evidence. In both quality and quantity the reports of the more recent exercises are an improvement over those held in the years immediately following World War II. But even the best exercise reports are of little value unless they are widely read and are actually used by the units and individuals that stand to benefit.

The repetition of deficiencies in exercise after exercise can be attributed largely to a neglect of the vital follow-up stage in the training process. Every exercise should be followed by individual and unit training programs designed to strengthen specific weaknesses revealed during the exercise. Each old exercise should be the guide to the new exercise. Planners at all levels should determine the nature of past mistakes, include their correction as stated objectives for the new exercise, and provide situations in which the objectives can be achieved. The attainment of these objectives must be emphasized during pre-exercise training, during the exercise itself, and during the critiques and in the final reports.

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*USAF Historical Studies: No. 80, Air Force Participation in Joint Army-Air Force Training Exercises, 1947-1950, pp. 69, 71; and USAF Historical Studies: No. 94, Air Force Participation in Joint Amphibious Training Exercises, 1946-1950, pp. 162-64.

This discouraging tendency to continue making the same mistakes--indeed some shortcomings that hampered exercises in 1946 and 1947 were being repeated in 1954*--has led some to lose confidence in the efficacy of maneuvers as a training medium and to question whether the time, effort, and money consumed can be justified. But there is little likelihood that training exercises can be abandoned no matter how great their failings. Immediately after World War II maneuvers were needed to keep alive the lessons and skills of the war. Now, field exercises have a different but no less significant function--that of serving as a testing ground for new concepts, methods, and weapons. For this purpose they are indispensable; there is no substitute short of combat. In the joint exercises and in the joint phases of the unilateral exercises several interservice controversies occurred. Although training exercises may tend to intensify disagreement and rivalry among the services, they do force differences into the open and bring them to a head. Exercises may do little more than emphasize the seriousness of an interservice problem and the need for dealing with it, but there is always the possibility--too seldom realized in these exercises, it is true--that as in combat the pressure of circumstances will force a compromise or produce a working arrangement that will serve as a basis for a lasting solution.

*For Summaries of the deficiencies that marked the exercises held during the period 1946-1950 see USAF Historical Studies: No. 80, Chapter IX, and USAF Historical Studies: No. 94, Chapter VI. A comparison of these deficiencies with those that characterized the exercises treated in the present study confirms the fact that the same mistakes were repeated time and time again, over a period of almost nine years. Especially was this true in the field of reconnaissance, in close-support operations, and in communications.

FOOTNOTES

Chapter I

1. Maneuver Director's Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 3 (Final Report, Exercise SOUTHERN PINE is a compilation of reports of the major participants in the exercise), Hist TAC, 1 Dec 50-30 Jun 51, Vol V, Pt II, p. 48.

2. Maneuver Director's Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 26; Hist Rpt, Opr and Tng, 1-30 Nov 50, in Hist TAC, 1 Jul-30 Nov 50, Vol V, doc 882[1]; ltr, OCAFF and Hq TAC to Maneuver Director, subj: Study Committee for Exercise SOUTHERN PINE [n.d.], in Hist TAC, 1 Dec 50-30 Jun 51, Vol V, Pt II, doc 126.

3. R&R, Radio TAC to Comm TAC, subj: Historical Report, Radio Branch, November 1950, 1 Dec 50, in Hist TAC, 1 Jul-30 Nov 50, Vol V, doc 884[2].

4. Maneuver Director's Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 13.

5. *Ibid.*, p. 22.

6. *Ibid.*, p. 24.

7. *Ibid.*

8. 9th AF, TAC, Final Rpt, Exercise SOUTHERN PINE, in Hist 9th AF, 1 Jul-31 Dec 51, Vol VII, App R; Hist TAC, 1 Dec 50-30 Jun 51, Vol V, Pt II, p. 50.

9. Maneuver Director's Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, pp. 9-10.

10. *Ibid.*, pp. 9, 13; Joint Airborne Task Force (hereafter cited as JATF) Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 131.

11. Hist 314th TC Wg (M), 1 Jun-30 Sep 51, Chap V, doc 3; Maneuver Director's Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 3.

12. Hist 314th TC Wg (M), 1 Jun-30 Sep 51, Chap V, doc 1; Troop Carrier Command Rpt (hereafter cited as TCC), in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 152, Maneuver Director's Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, pp. 63-64.

13. Rpt of Aggressor Air Force, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 225, Maneuver Director's Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 66.

14. Maneuver Director's Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 65.

15. TCC Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 173; Rpt of Aggressor Air Force, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 225.

16. Hist 123d Ftr-Bmr Gp, 1 Jul-30 Sep 51, p. 7; Hist 117th Tac Rcn Gp, 1 Jul-30 Sep 51, p. 8; Maneuver Director's Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, pp. 63-64, 66.

17. Aggressor Army Forces Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 216; Maneuver Director's Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 60.

18. 9th AF, TAC, Final Rpt, Exercise SOUTHERN PINE, 6-27 Aug 51, p. 42, in Hist 9th AF, 1 Jul-31 Dec 51, Vol VII, App R.

19. TCC Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, pp. 158, 160.

20. Aggressor Army Forces Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 218.

21. Maneuver Director's Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 4.

22. Hq TCC Exercise SOUTHERN PINE, General Plan Troop Carrier Command, 25 Apr 51, Annex B.

23. *Ibid.*; Hq Southeastern Theater Opr Plan 1-51, 25 May 51; Maneuver Director's Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 4.

24. Aggressor Army Forces Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 219; Maneuver Director's Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 4.

25. Maneuver Director's Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 7.

26. *Ibid.*, pp. 7, 9; Ground Umpire Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 76.

27. Hq 123d Ftr-Bmr Wg, Hist of Exercise SOUTHERN PINE, 13-27 Aug 51, p. 12.

28. Hist 85th Bomb Sq (L) Jet, 23 Jul-31 Aug 51, Phase III, p. 2.

29. Hist 117th Tac Rcn Gp, 1 Jul-30 Sep 51, p. 8; 9th AF, TAC, Final Rpt, Exercise SOUTHERN PINE, 6-27 Aug 51, p. 74, in Hist 9th AF, 1 Jul-31 Dec 51, Vol VII, App R.

30. Aggressor Air Force Rpt, in Final Rpt, Exercise Southern Pine, Aug 51, p. 229.

31. JATF Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, pp. 131-32; Hq Southeastern Theater, Opr Plan 1-51, 25 May 51, p. 3.

32. TCC Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 166.

33. 82d Abn Div Rpt (Abn Phase), in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 135.

34. *Ibid.*, pp. 135-36.

35. *Ibid.*, p. 136.

36. TCC Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, pp. 152, 163, 167.

37. *Ibid.*, p. 170.

38. 82d Abn Div Rpt (Abn Phase), in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 134.

39. TCC Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 168.

40. *Ibid.*, p. 165; Hist 18th AF, 28 Mar-31 Dec 51, I, 407-11.

41. TCC Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 155.

42. *Ibid.*; JATF Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 131.

43. Chronological Rpt on Day-to-Day Helicopter Operations, 17-25 Aug 51, in Hist 316th TC Gp, 1 Jun-30 Sep 51, doc 60; TCC Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 163.

44. TCC Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 163.

45. *Ibid.*, p. 164; 9th AF, TAC, Final Rpt, Exercise SOUTHERN PINE, 6-27 Aug 51, p. 5, in Hist 9th AF, 1 Jul-31 Dec 51, Vol VII, App R.

46. 301st Logistical Command Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 201; Maneuver Director's Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 37.

47. Special Hist Rpt on the 507th TAC Control Gp during Exercise SOUTHERN PINE, 13-27 Aug 51, pp. 8, 13-14; Hq 9th AF Opr Plan 6-51, 1 Jul 51, Annex E, App 1.

48. Special Hist Rpt on the 507th Tac Con Gp during Exercise SOUTHERN PINE, 13-27 Aug 51, p. 9.

49. Hq 9th AF Opr Plan 6-51, 1 Jul 51, Annex E, App 1.

50. Aggressor Air Force Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, pp. 227-28.

51. Hist of the 3d Shoran Beacon Unit for Exercise SOUTHERN PINE, 20 Jul-29 Aug 51, pp. 9, 12; Hq 9th AF Opr Plan 6-51, 1 Jul 51, Annex E, App 1.

52. Rpt of Atomic Play in Exercise SOUTHERN PINE, in Hist 9th AF, 1 Jul-31 Dec 51, Vol III, doc 73.

53. *Ibid.*

Chapter II

1. 9th AF Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 98; TCC Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, pp. 154, 173.

2. Maneuver Director's Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, pp. 22-24.

3. *Ibid.*, pp. 30, 32.

4. *Ibid.*, pp. 43-44.

5. 9th AF, TAC, Final Rpt, Exercise SOUTHERN PINE, 6-27 Aug 51, pp. 5, 29, in Hist 9th AF, 1 Jul-31 Dec 51, Vol VII, App R.

6. Maneuver Director's Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 39.

7. 9th AF, TAC, Final Rpt, Exercise SOUTHERN PINE, 6-27 Aug 51, pp. 1, 25, in Hist 9th AF, 1 Jul-31 Dec 51, Vol VII, App R.

8. USAF Historical Studies: No 94, Air Force Participation in Joint Amphibious Training Exercises, 1946-1950. Chap. V.

9. 9th AF, TAC, Final Rpt, Exercise SOUTHERN PINE, 6-27 Aug 51, p. 1, in Hist 9th AF, 1 Jul-31 Dec 51, Vol VII, App R, p. 1; Hist TAC, 1 Dec 50-30 Jun 51, Vol V, Pt II, pp. 59-61; ltr, CINCLANTFLT to C/AFF and CG TAC, subj: Naval Participation in Exercise SOUTHERN PINE, 2 May 51, in Hist TAC, 1 Dec 50-30 Jun 51, Vol V, Pt II, doc 133.

10. 9th AF, TAC, Final Rpt, Exercise SOUTHERN PINE, 6-27 Aug 51, pp. 5, 28, in Hist 9th AF, 1 Jul-31 Dec 51, Vol VII, App R.

11. VII Corps Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, pp. 100, 104, 110; Rpt of Air-Ground Opr Sp Staff Sec, Maneuver Dir Hq, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 124.

12. See Air War College thesis titled "Selected Factors Influencing Air Force-Army Relations and Employment of Air Forces, 1941-1953," by Col. Frank S. Perego, dated Apr 54. During the period of Exercise SOUTHERN PINE Col. Perego was Ninth Air Force Deputy for Operations and had firsthand knowledge of the exercise.

13. VII Corps Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, pp. 104, 110.

14. Maneuver Director's Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 43.

15. *Ibid.*

16. Air Umpire Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, pp. 82-83; Aggressor AF Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 229.

17. 9th AF, TAC, Final Rpt, Exercise SOUTHERN PINE, 6-27 Aug 51, p. 75, in Hist 9th AF, 1 Jul-31 Dec 51, Vol VII, App R.

18. 82d Abn Div Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 122.

19. Rpt of Air-Ground Opr Sp Staff Sec, Maneuver Dir Hq, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 129.

20. 9th AF, TAC, Final Rpt, Exercise SOUTHERN PINE, 6-27 Aug 51, p. 74, in Hist 9th AF, 1 Jul-31 Dec 51, Vol VII, App R.

21. Rpt of Air-Ground Opr Sp Staff Sec, Maneuver Dir Hq, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, pp. 124, 127, 129.

22. 9th AF, TAC, Final Rpt, Exercise SOUTHERN PINE, 6-27 Aug 51, p. 6, in Hist 9th AF, 1 Jul-31 Dec 51, Vol VII, App R.

23. Rpt of Air-Ground Opr Sp Staff Sec, Maneuver Dir Hq, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 127.

24. *Ibid.*, pp. 127-28.

25. 9th AF, TAC, Final Rpt, Exercise SOUTHERN PINE, 6-27 Aug 51, pp. 76, 105, in Hist 9th AF, 1 Jul-31 Dec 51, Vol VII, App R.

26. 123d Ftr-Bmr Wg Hist of Exercise SOUTHERN PINE, 13-27 Aug 51, p. 13.

27. 137th Ftr-Bmr Gp Sp Hist Rpt, Exercise SOUTHERN PINE, 2-27 Aug 51, p. 6, in 137th Ftr-Bmr Wg Hist of Exercise SOUTHERN PINE, 13 Jul-1 Sep 51; 123d Ftr-Bmr Wg Hist of Exercise SOUTHERN PINE, 13-27 Aug 51, p. 14; Sp Hist Rpt on 507th Tac Con Gp during Exercise SOUTHERN PINE, 13-27 Aug 51, pp. 13-14.

28. 9th AF, TAC, Final Rpt, Exercise SOUTHERN PINE, 6-27 Aug 51, pp. 76, 104-5, in Hist 9th AF, 1 Jul-31 Dec 51, Vol VII, App R; 137th Ftr-Bmr Gp Sp Hist Rpt, Exercise SOUTHERN PINE, 2-27 Aug 51, p. 6, in 137th Ftr-Bmr Wg Hist of Exercise SOUTHERN PINE, 13 Jul-1 Sep 51, Hist of 117th Tac Rcn Wg for Exercise SOUTHERN PINE, Aug 51, p. 26.

29. 123d Ftr-Bmr Wg Hist of Exercise SOUTHERN PINE, 13-27 Aug 51, p. 14; 9th AF, TAC, Final Rpt, Exercise SOUTHERN PINE, 6-27 Aug 51, p. 76, in Hist 9th AF, 1 Jul-31 Dec 51, Vol VII, App R.

30. 9th AF, TAC, Final Rpt, Exercise SOUTHERN PINE, 6-27 Aug 51, pp. 75, 88, 104, in Hist 9th AF, 1 Jul-31 Dec 51, Vol VII, App R.

31. Hist of 117th Tac Rcn Wg for Exercise SOUTHERN PINE, Aug 51, p. 26.

32. USAFHS-80, pp. 26-27.

33. Hist 85th Bomb Sq (L) Jet, 23 Jul-31 Aug 51, Phase III, pp. 3-4.

34. *Ibid.*, p. 3.

35. VII Corps Rpt, in Final Rpt, Exercise SOUTHERN PINE, Aug 51, p. 102.

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38. Hq Umpire Gp, Med Air Umpire Final Rpt, Exercise LONG HORN, 26 Feb-10 Apr 52, pp. 7-8, in Rpt of Opr, 1st Aeromed Gp, Activation through Exercise LONG HORN, Exhibit #20.

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12. Hq 9th AF, Special Rpt, Exercise LONG HORN (n.d.), pp. 11-12

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27. 118th Tac Rcn Wg Maneuver Final Rpt, Exercise LONG HORN, 30 Apr 52, pp. 16-17.
28. Hq 9th AF, Special Rpt, Exercise LONG HORN (n.d.), Sec III, p. 18.
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GLOSSARY

ACW	Aircraft control and warning
AFF	Army Field Forces
AIR	Airborne infantry regiment
ALO	Air liaison officer
ALA	Assault-landing area
AOC	Air operations center
CAA	Civil Aeronautics Administration
CALSU	Combat airlift support unit
CP	Command post
CPX	Command post exercise
CSF	Casualty staging flight
DACG	Departure airfield control group
D/F	Direction finding
DZ	Drop zone
EW	Electronic warfare
FAC	Forward air controller
FACP	Forward airfield control party
FM	Frequency modulated
FSCC	Fire support coordination center
GCI	Ground-controlled interception
Georef	Geographical Reference
GZ	Ground zero
HF	High frequency
HF-CW	High frequency-continuous wave
IFF	Identification, friend or foe
IP	Initial point
JAPC	Joint air photo center
JATF	Joint airborne task force
JTF	Joint task force
JOC	Joint operations center
L/W	Lightweight
LZ	Landing zone
MASH	Mobile army surgical hospital
MATS	Military Air Transport Service
MCC	Movement control center
MLR	Main line of resistance

NOTAMS	Notices to airmen
OCAFF	Office, Chief of Army Field Forces
RCT	Regimental combat team
RIO	Reporting in and out
SAC	Strategic Air Command
Shanicle	Short range navigation vehicle
Shoran	Short range navigation
SOP	Standing operating procedure
SPAR	Super precision approach radar
TAC	Tactical Air Command
TACC	Tactical air control center
TACP	Tactical air control party
TADC	Tactical air direction center
TADP	Tactical air direction post
TMC	Transport movement control
T/O&E	Table of organization and equipment
UHF	Ultra high frequency
UTM	Universal Transverse Mercator
VHF	Very high frequency
ZI	Zone of interior

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