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**AIRBORNE OPERATIONS IN WORLD WAR II,  
EUROPEAN THEATER**

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## *Foreword*

This monograph describes the planning and execution of airborne operations by the Army Air Forces in the European Theater during World War II. Intended to serve as a case history of large-scale airborne operations, it seeks to analyze and evaluate them as a basis for doctrine and for the information of future planners. This history was written by Dr. John C. Warren of the USAF Historical Division.

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



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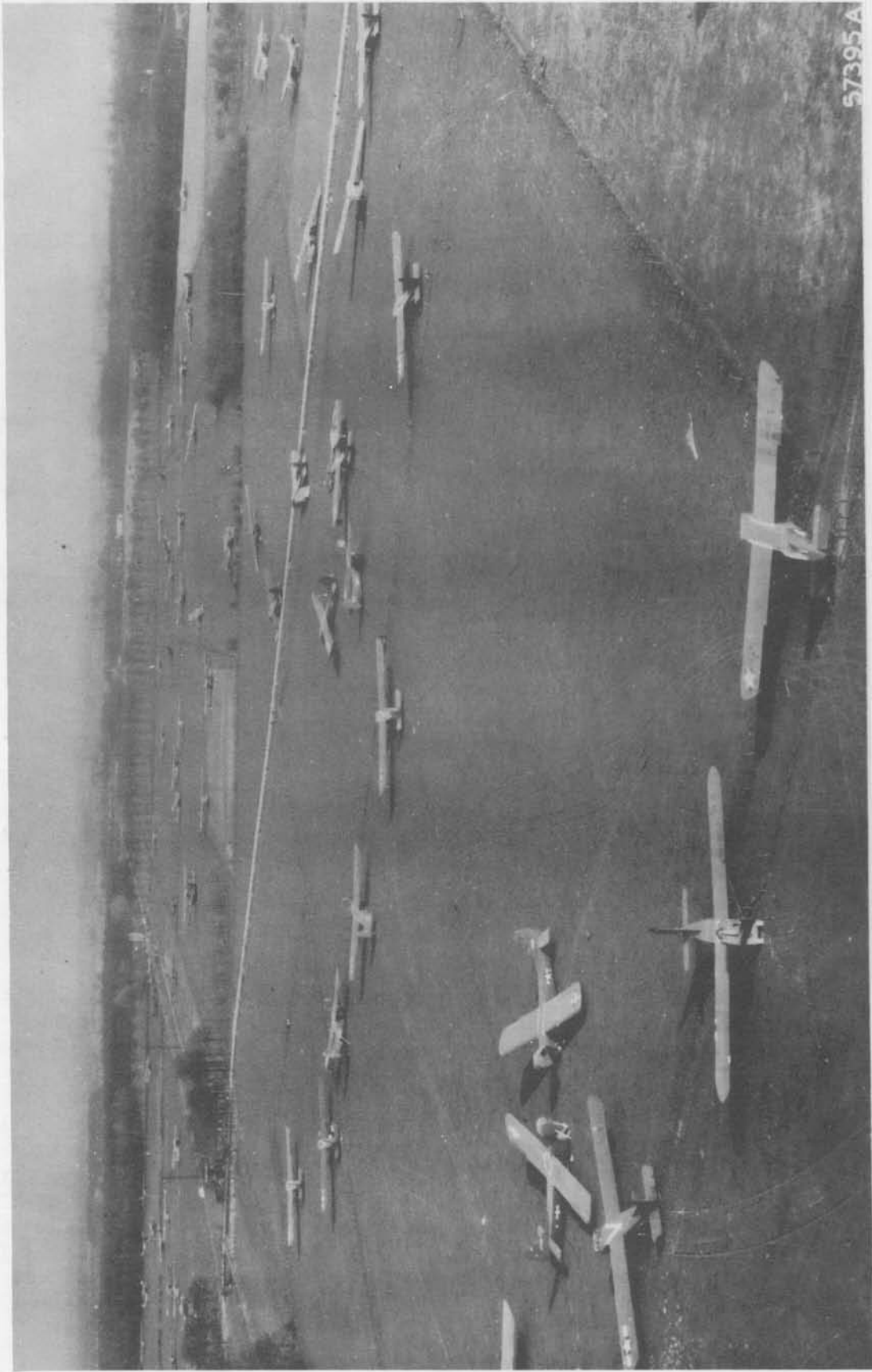
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*Waco Gliders on Landing Zone near Wesel Germany after Operation VARSITY.*



## The Airborne Invasion of Normandy - Plans and Preparations

### Background

THE FIRST combat airborne missions in history were flown by the Germans in 1940. Recognizing the possibilities of such operations, the British and Americans followed suit. The first British mission was flown in February 1941, and the first American mission was flown from England to Oran, Algeria, on 8 November 1942 as part of the Anglo-American invasion of North Africa. Other, later missions, principally in the Mediterranean region, provided the American troop carriers with an apprenticeship in airborne warfare.\* However, until the summer of 1944 no force larger than a reinforced regimental combat team was flown into action in any Allied mission. In World War II the only Allied airborne operations employing more than one division took place in the invasion of Normandy, the unsuccessful attempt to win a bridgehead across the Rhine at Arnhem, and the successful crossing of the Rhine at Wesel.† Consequently the study of airborne missions in the European Theater of Operations is of particular importance for the light it throws on the planning and performance of large-scale airborne assaults.

The invasion of Normandy occurred on 6 June 1944, but preparations for that event had begun long before. British planning for an invasion of the Continent had been carried on as early as 1941, and after the United States entered the war,

\*See USAF Historical Study 74, *Airborne Missions in the Mediterranean, 1942-1945*. For airborne operations in Burma and New Guinea, see W. F. Craven and J. L. Cate, *The Army Air Forces in World War II*, IV (Chicago, 1950), 181, 184-86, 503-7, 516-17, 658-59.

†In DRAGOON, the invasion of southern France, the troop carriers delivered one provisional airborne division of approximately 9,000 men.

President Roosevelt and his Chief of Staff, General George C. Marshall, concentrated unswervingly on that objective as the decisive action of the war. Actual preparations for such an invasion were begun early in 1942 under the code name of BOLERO. The BOLERO plans called for creation of a mighty airborne force, for which the 51st Troop Carrier Wing and a paratroop battalion were sent to England that summer as the first American installment.

The decision at the end of July 1942 to launch an invasion of North Africa before attempting an attack on Festung Europa postponed further planning of the latter operation for several months. It also resulted in a sweeping diversion to Africa of men and materiel needed for an invasion of Europe. In the spring of 1943 only one American division and no American airborne units remained in the British Isles. American airpower in the United Kingdom consisted of less than 12 operational combat groups of all types, including half of a troop carrier group.<sup>1</sup> British striking power was similarly depleted.

In May 1943 when the TRIDENT conference was held in Washington, it was obvious that between the invasion of Sicily, scheduled for 10 July, and the end of the summer there would not be time to concentrate an invasion force in the United Kingdom. Therefore, although at TRIDENT the Allies sanctioned renewed preparations for an invasion of Northwest Europe, they gave it a target date of 1 May 1944. To this crucial operation they gave the name OVERLORD. On 25 May 1943 the Combined Chiefs of Staff pledged a build-up to 29 divisions, two of them airborne, before the target date.

## **Early Planning—The COSSAC Phase**

These decisions were received by a planning headquarters, already in existence. Pending appointment of a Supreme Allied Commander for the invasion, Lt. Gen. Frederick E. Morgan, a British officer, had been appointed on 12 March as Chief of Staff to the Supreme Allied Commander. During April Morgan had set up at Norfolk House in London a headquarters which shared with its chief the code name of COSSAC (taken from the initials of his title). On 14 April Brig. Gen. Robert C. Candee, Commanding General of VIII Air Support Command, reported to Morgan for additional duty as Principal Staff Officer of the AAF Branch of COSSAC. On 26 April, just before TRIDENT, the Combined Chiefs of Staff gave COSSAC a directive including in its responsibilities the planning of a full-scale invasion of the Continent in 1944.<sup>2</sup>

At that time the AAF commanders in England were struggling with the problem of working out a proper buildup for their forces, and the AAF Branch of COSSAC began its career by participating in this task. General Candee, convinced of the importance of airborne operations, recommended a buildup to 23 American troop carrier groups with an assigned strength of 1,196 planes as being "the minimum necessary" for airborne operations in the invasion. Since that was almost as many troop carrier craft as the entire AAF possessed at that time, Candee's proposal seemed impracticable and had no immediate effect. A chart brought by General Stratemeyer from the United States indicated that only nine groups would be available. That estimate was favored by the bomber men in the Theater and endorsed by Maj. Gen. Follett Bradley, Air Inspector of the AAF, who arrived in England in May to assess the overall requirements of the AAF for the invasion. On 25 May the Combined Chiefs of Staff decreed a troop carrier buildup of 8½ American groups and 7 British squadrons, a total of 634 troop carrier aircraft. This figure remained unchanged for the next four months.<sup>3</sup>

General Morgan was convinced that OVERLORD should be based on all available information, but designed without reference to previous plans. Therefore his staff surveyed the whole west coast of Europe before deciding late in June (as

some British planners had done before them) that the grand assault should be launched against the coast of Normandy between the Caen area and the Cotentin Peninsula. Unlike its most favored rival, the Pas de Calais, Normandy had not been heavily fortified by the Germans. It had good beaches within fighter range of England, a great port in Cherbourg, and adequate sites for airfields.

On 15 July a preliminary study on the proposed invasion was submitted to the British Chiefs of Staff, and on the 30th, COSSAC issued a rather vague and tentative outline plan for an invasion of Normandy. In essence the plan called for an amphibious assault by three divisions against beaches between the mouths of the Orne and the Vire. The initial objective was a line running between Grandcamp, Bayeux and Caen. Morgan would have preferred to land another division further west on the beaches of the Cotentin, but he had been promised barely enough landing craft to carry three in the initial assault.

At first COSSAC had been inclined to employ its airborne forces on the right flank near Carentan rather than to risk them in the Caen area. The 634 troop carrier aircraft promised for the invasion could carry only two-thirds of a division at a time, and it was thought that at least a whole division would be needed to take Caen. On the other hand, Caen was the gateway to Normandy. In Allied possession it would be a barrier to enemy troops seeking to enter the invasion area from the east or northeast. It could also provide an entry into central France when the Allies were ready to attack out of the beachhead. So tempting a prize persuaded Morgan to approve an airborne assault against Caen.

Between 21 and 28 July COSSAC decided on an initial assault by two-thirds of a British airborne division to take Caen and, less definitely, on assaults by seven American paratroop battalions\* against coastal batteries and river crossings on the right flank of the beachhead. The minimum number of troop carrier aircraft needed to carry out the program was estimated to be 799 planes. COSSAC therefore requested at least 13 American troop carrier groups (of 52 planes each) plus a reserve of 120 aircraft and crews.

Room for additional troop carrier units would have to be found on Britain's crowded airfields.

\*The May estimate of airborne forces for OVERLORD had been increased by five American paratroop regiments.

Fortunately, higher echelons proved sympathetic. For example, Lt. Gen. Ira C. Eaker, Commander of Eighth Air Force, wrote on 3 August that he believed the proposed increment could be squeezed in. The next step was to present the COSSAC plan to the Allied leaders who convened at Quebec on 17 August 1943 for the QUADRANT conference. They not only approved the plan but also intimated that it might be possible to expand it. They offered little prospect of increasing the buildup of troop carrier units from the United States, but COSSAC was already exploring the possibility of getting them from other theaters of operations.

The Mediterranean theater was a promising source for all kinds of reinforcements for OVERLORD. Because the British were loath to halt major operations in that area, decisive action to divert its resources was not taken at Quebec. However, such action was contemplated and was already regarded as almost certain. Soon after the QUADRANT meetings, negotiations to obtain four additional troop carrier groups from the Mediterranean were in full swing. By November the four groups were included in flow charts, and fields were earmarked for their use. At Cairo in December the Chiefs of Staff officially allocated 13½ American troop carrier groups with 880 aircraft for use in OVERLORD. This level was to be achieved by taking from Italy the 52d Troop Carrier Wing with four groups plus two squadrons of the 315th Troop Carrier Group. Preparations for their transfer to the ETO were initiated on 8 January 1944.<sup>4</sup>

While the size of the airborne forces to be used in OVERLORD was being determined, the doctrine which was to govern their employment was just beginning to take shape. Indeed, written doctrine for airborne operations scarcely existed in July 1943 when the Allies invaded Sicily (Operation HUSKY). Allied experience in the field was too recent and limited. Operations in HUSKY had been expected to serve as a guide, but initial reports on them were incomplete and contradictory. As the summer progressed it became evident that the execution of the airborne missions in Sicily had been poor and their success rather limited. The conclusion was drawn that unless planning, equipment, and training could be markedly improved the premises of the COSSAC plan were too optimistic.<sup>5</sup>

Planning for HUSKY had not been well coordi-

nated, partly because the headquarters of many of the commands involved had been widely separated. Great pains were taken to see that the several headquarters planning OVERLORD would work closely together. In HUSKY the routes selected for the troop carriers had been much too complicated and difficult. The planners resolved to make them as simple as possible for OVERLORD. Fire from Allied guns had disrupted two airborne missions to Sicily in spite of the establishment of safety zones and in spite of warnings to the surface forces. Henceforth the necessity for ample precautions against such mishaps and particularly for keeping as far away as possible from convoys and naval vessels was consistently stressed.

The principal glider mission in HUSKY had been a fiasco, largely because the gliders had been released at night over the open sea. Because of the glider's ability to deliver men and materiel in concentrated packets, COSSAC had hitherto favored it over the parachute and had planned to use 350 gliders in the initial assault.

However, all agreed that the initial airborne assault in OVERLORD would require the protection of darkness, and HUSKY had confirmed earlier opinions that glider missions should not be flown at night except perhaps in fair weather under a full moon. Chances of getting fair weather and a full moon simultaneously for OVERLORD were less than 50 percent. These circumstances explain why responsibility for the initial assault came to rest with the paratroops.

Faulty navigation at night in the Sicilian missions had caused dispersion of the paratroop drops over the entire southeastern portion of the island. These errors stimulated a search for means to guide the troop carriers to their objectives in spite of darkness or bad weather. One remedy was the dropping of pathfinder troops before the arrival of an airborne mission to mark drop or landing zones. Some experimentation with pathfinder teams using visual aids had been done, and the need to provide guidance for formations which otherwise might pass many miles outside visual range led to consideration of radio and radar beacons for pathfinder use. Most promising of these was the Eureka, a simple, light, durable instrument which could be dropped by parachute and be put into operation within five minutes. Its responses to the signals of an airborne interrogator called Rebecca gave an accurate bearing and a fair indica-

tion of distance at ranges which varied considerably with conditions but were generally over 10 miles. After pathfinder teams equipped with Eureka proved effective in guiding airborne missions during the invasion of Italy it was generally accepted that pathfinder tactics would be employed in OVERLORD.

The American CG-4A glider, commonly known as the Waco, had proved combat-worthy in Sicily, but it was small, unable either to carry over 3,750 pounds or to take a gun and its prime mover in one load. Made of fabric with a tubular steel frame, the Waco was durable except for its nose, which was weak and easily crushed. Also, the nose, which was hinged to swing outward and up, was the only door, so that if the glider skidded into an obstacle, as commonly happened in Sicily, the cargo would be sealed in.

The British had developed a plywood glider, the Horsa, which could carry 6,700 pounds and could contain both a 75-mm. howitzer and a jeep to tow it. Early models had two passenger doors and a cargo door in the sides. The Horsa, although liable to break loose in flight and to splinter on landing, did well enough in Sicily to interest the Americans in adopting it. This interest grew after tests conducted in August proved that a C-47 could tow a Horsa, albeit with some difficulty. The British also had a giant glider, the Hamilcar, with a capacity of 17,500 pounds. Few in numbers and as yet untested in combat, the Hamilcar required an exceptionally powerful four-engined airplane to tow it. The American troop carriers consequently regarded it as unsuitable for their use.

HUSKY had revealed at least as much about the troop carrier crews as about their equipment. Some analysts considered that the greatest single lesson of the airborne operations in Sicily was that troop carrier crews needed far more training in night flying, especially night flying in formation. Weakness in this field had caused a tremendous amount of straggling and excessively loose formations. Almost all aspects of glider training had been shown to need improvement.

These shortcomings and others should have been revealed by a rehearsal, but there had been no rehearsal and few realistic exercises by the troop carriers before HUSKY.\* The planners resolved that before OVERLORD the troop carriers would

be thoroughly trained in night flying and glider work and that their proficiency would be tested by numerous exercises capped by a realistic rehearsal.<sup>6</sup>

The command structure under which troop carrier operations in the European theater were to be conducted developed gradually. In June 1943 Air Marshal Trafford Leigh-Mallory, chief of the RAF Fighter Command, had been named provisionally to head the air planners of COSSAC, and at Quebec in August the Allies had agreed to designate him as commander in chief of their tactical air forces in OVERLORD. After a period of discussion over the extent of its authority, his command, the Allied Expeditionary Air Force, was established in November. Headquarters, AEAFF was located at Stanmore, a dozen miles northwest of London, but a delegation was left at Norfolk House to collaborate with COSSAC.

Immediate, full, and direct control of the Second Tactical Air Force, RAF, Air Defense of Great Britain, and the RAF 38 Group was given to AEAFF as of 15 November. All British troop carrier operations were in the hands of 38 Group. Equivalent in size to an American wing, it was equipped with converted bombers good for glider work but ill-suited for paratroop operations. The British planned to expand 38 Group to 9 squadrons with 180 aircraft in time for OVERLORD. In December, as a result of pressure to enlarge the airborne assault, the RAF decided to establish another troop carrier group. The tactical air commanders had asked the Air Ministry for a loan of 150 Dakotas (British C-47's) from the RAF Transport Command and at least 150 bombers from Bomber Command for use in OVERLORD. The bombers were not forthcoming, but the Dakotas were. On 17 January 1944 this new force was organized as the RAF 46 Group. It was to be under operational control of 38 Group until after OVERLORD and would then revert to Transport Command.<sup>7</sup>

American tactical air units in England had been organized on 16 October 1943 into the Ninth Air Force under the command of Maj. Gen. Lewis H. Brereton, a veteran who within the past two years had commanded air forces in a wide variety of combat activities in four theaters of operations. Simultaneously with the creation of Ninth Air Force, IX Troop Carrier Command was activated as one of its components, replacing a provisional

\*The reasons for this situation are explained in USAF Historical Study 74, *Airborne Missions in the Mediterranean, 1942-1945*, Chap. III.

command set up by the Eighth Air Force in September. Its commander was Brig. Gen. Benjamin F. Giles. However, even before General Giles assumed his command, it was understood that Brig. Gen. Paul L. Williams, who had directed the troop carriers during almost all the Allied airborne operations in the Mediterranean theater, would take over IX Troop Carrier Command before intensive preparation for OVERLORD was begun.<sup>8</sup> When activated the troop carrier command had under it only one recently arrived troop carrier group, the 434th, and a detachment of the 315th Group with two or three planes.\* The 435th Group and the headquarters of the 50th Troop Carrier Wing arrived from the United States before the end of the year.<sup>9</sup>

On 15 December AEAFF received operational control of Ninth Air Force and its components. In the case of the troop carriers this control was to be unusually direct and complete. Leigh-Mallory regarded the coming airborne operations as subject to his special prerogative. He stated as a matter of course that planning for airborne operations would be done between his headquarters and 21 Army Group, which was to command the ground forces in the assault phase of OVERLORD. Coordination of plans for such operations with other outside agencies was also to be handled by AEAFF, and it was to have the final say in arrangements for fighter protection, routing, altitude, timing, and recognition procedure in airborne missions. Although subordinate commands would participate, all of the planning except such details as could be worked out between troop carrier wings and the ground units they were to carry was to be concentrated in AEAFF headquarters.

On 6 December Leigh-Mallory announced that the launching of airborne forces would be the responsibility of his headquarters. At a conference three days later he asserted that AEAFF should have direct operational control, not only of 38 Group, but also of Ninth Air Force's subsidiary, IX Troop Carrier Command, and he got an expression of agreement on this point from Brereton.<sup>10</sup>

Debatable points in the airborne planning were

\*At that time an American troop carrier group was composed of a headquarters with 4 aircraft and 4 squadrons with 12 planes apiece. About half of the 315th Group had reached England early in 1943, but most of the planes and crews had been flown to North Africa in May to supplement the troop carrier forces committed to HUSKY and had been kept there.

ironed out at meetings of the Airborne-Air Planning Committee. This organization, established in December, included Leigh-Mallory, the British and American troop carrier commanders, the principal British and American airborne commanders, and such other persons as might be needed on a given occasion. At its meetings Leigh-Mallory presided and usually played a dominant role.<sup>11</sup>

At times the AEAFF commander acted as though his operational and planning authority included the right to direct supervision of troop carrier training. Brereton insisted sharply that such supervision be exercised indirectly through the Ninth Air Force. Even this indirect authority was challenged by USSTAF which, as the highest AAF headquarters in the United Kingdom in 1944, claimed to have sole authority over the training of Ninth Air Force. In practice the troop carrier command was in constant close consultation with both AEAFF and the Ninth Air Force in training matters, but had very little to do with USSTAF.<sup>12</sup>

One important link in the chain of command controlling airborne operations in Normandy was not forged until the spring of 1944. On 27 January the Airborne-Air Planning Committee recommended that a joint troop carrier operations room and command post be set up for IX Troop Carrier Command, 38 Group, and 46 Group in the Uxbridge area near AEAFF headquarters for use during large-scale exercises and operations. Leigh-Mallory favored the idea, and on 21 February it was agreed that such a post should be established. A suitable room was found at Eastcote Place, and on 9 April IX Troop Carrier Command set up an advance command post there. The facilities at Eastcote were tested in a subsequent exercise and proved very satisfactory. Under the title of Troop Carrier Command Post this was the point from which troop carrier operations in the invasion were directed.<sup>13</sup>

During the autumn of 1943 Leigh-Mallory played the leading part in an interesting episode affecting airborne planning. In October General Morgan had visited Washington to discuss OVERLORD with American military leaders. There Lt. Gen. H. H. Arnold, Chief of the United States Army Air Forces, presented him with a plan, supported by the chief of staff, General George C. Marshall, to make OVERLORD predominantly an airborne operation. As many as three airborne and air transported divisions were to be delivered to a

strategic point well inland from the French coast. This force was to sever enemy communications and strike out in all directions until such time as sea-landed forces made contact with it.

Feeling the need for assistance in so momentous a matter, the COSSAC commander called for Leigh-Mallory. He arrived about the end of October and after examining the project gave his verdict against it. In the first place, Leigh-Mallory observed, the allotted troop carrier aircraft could not lift much more than one division at a time. Secondly, Leigh-Mallory had a somewhat exaggerated idea of what German guns and planes could do to an airborne mission. Thirdly, he believed, in company with most experts at that time, that airborne units should not be expected to operate against a strong enemy for more than a day or two before junction with friendly ground forces. Tailored to the limited capacity of the C-47, an American airborne division had no armor, no vehicle bigger than a jeep and less than half the firepower of an infantry division. Some consideration had been given to using Hamilcar gliders to carry tanks or big guns in OVERLORD, but the Hamilcars were few in number, and only one squadron in 38 Group had planes capable of towing them. Resupply by air was still in the experimental stage and was viewed with some skepticism. For instance, on 1 January 1944 the AEF Chief of Operations wrote that he did not believe large ground forces in action would ever be wholly supplied by air. The number of aircraft required would, he thought, be prohibitive. On such grounds as these the AAF plan was rejected. However, the exponents of "vertical envelopment" were not discouraged. They revised their plans and bided their time to make a new proposal.<sup>14</sup>

It appeared settled that the airborne troops would not be used independently; but exploration of how they would be used had barely begun. In December, 21 Army Group had initiated preparation of a plan for OVERLORD. Syndicates representing appropriate ground, air, and naval commands were set up at the army group headquarters, St. Paul's School, in London to examine various aspects of the invasion.

One syndicate, analyzing the threat of counter-attack by German armored forces, observed that the roads to the proposed beachhead converged on Caen at its eastern end and on Bayeux in the center of the area. Consequently plans were laid

for the employment of a British airborne brigade at points east of Caen to block the crossings of the Orne and for drops and landings southeast and southwest of Bayeux by American airborne units to cut highways leading to that town.

Airborne operations around Bayeux had one grave drawback. The terrain outside the town was open with few obstacles to deter enemy armor from overrunning the positions of the lightly armed airborne troops. However, within a few days the problem became academic when the accession of new commanders produced fundamental changes in the nature of OVERLORD.<sup>15</sup>

### **Shaping the Outline Plans**

Firm planning for OVERLORD could not begin until the Supreme Commander of the Allied Expeditionary Force (SCAEF)\* was chosen. On 5 December the choice fell on Lt. Gen. Dwight D. Eisenhower, who had commanded the Allied forces in the Mediterranean theater ever since their first landings in North Africa. Shortly thereafter General Bernard L. Montgomery, who was famed for his victory at El Alamein and who had served under Eisenhower as commander of the British Eighth Army in the Tunisian, Sicilian, and Italian campaigns, was named commander of 21 Army Group. Under him two other veterans of the Mediterranean campaigns, Lt. Gen. Omar N. Bradley and Lt. Gen. Miles C. Dempsey respectively, were to command the First United States Army and the British Second Army.

These appointments were the harbingers of change, for on learning of the COSSAC plan both Eisenhower and Montgomery immediately became convinced that the assault was too weak and on too narrow a front. On 2 January 1944, Montgomery arrived in England to act as Eisenhower's representative pending the latter's arrival. No sooner had he been briefed on the COSSAC program than he threw all the weight of his strong personality and great prestige into an effort to expand the initial assault to a strength of five divisions, even threatening to resign his command if the change were not made. By 6 January planning on the old basis had been halted, and ways

\*Eisenhower's headquarters was commonly known as SHAEF, an abbreviation of its full title, Supreme Headquarters, Allied Expeditionary Force.

and means to mount the larger assault were under consideration at COSSAC.<sup>16</sup>

On 14 January Eisenhower arrived in England to support the new dispensation, and to take over from COSSAC the responsibility for OVERLORD. On the 21st Eisenhower held at Norfolk House the first two meetings of his principal commanders. There Montgomery presented the case for a five-division assault on a front extended westward onto the Cotentin peninsula. The United States First Army would drive ashore with two divisions, one a little way northwest of Bayeux, the other at the base of the Cotentin. Three divisions of British Second Army would land between Bayeux and Ouistreham. The meeting endorsed the proposal, and, accordingly, on the night of 23 January a message was sent to the Combined Chiefs of Staff asking their assent. This was given on the 31st.

Obtaining the additional landing craft required for the enlarged assault was to prove extremely difficult. To get more time to obtain these boats the CCS on 31 January postponed the target date for OVERLORD from 1 May to 1 June,\* but not until 21 March did they finally make up their minds to meet the needs of OVERLORD by taking from the Mediterranean assault craft hitherto earmarked for ANVIL, an invasion of southern France.

Planning could not be postponed to await this decision. On 15 January 21 Army Group, assuming that the five-division plan would receive both official approval and the necessary shipping, had set up new interservice syndicates. They were directed to produce by the end of the month an initial joint plan from which further planning on Army-Air Force levels could proceed.<sup>17</sup>

The situation of the American division which was to land on the Cotentin peninsula was perilous enough to warrant special attention. Its beach, a mile of hard sand later christened UTAH, near the village of St. Martin-de-Varreville, was fenced in by two natural barriers. Behind it lay a swampy area which the Germans had flooded. Four causeways which crossed this flooded land had to be taken if the Americans were not to be confined to the beach. On the left was a second barrier, the marshy valleys of the Douve, Vire, and Taute,

which lay between the Cotentin and the rest of the invasion area. Since practically all routes across those valleys centered on the town of Carentan, the Germans by holding that town could isolate the UTAH force,\* which might then be defeated or at least effectively contained.

On the other hand, if airborne troops seized the causeways and cleared the way for an advance across the Douve, the UTAH force might take Carentan on D-day and establish contact with the other assault divisions. It would then be free to make a quick stab northward toward the valuable port of Cherbourg.

An airborne mission in the UTAH area was both feasible and relatively safe. Ample drop zones were available. The marshy, stream-girt meadows behind the coast were full of obstacles to enemy armor. No strong German forces were known to be in the vicinity, and the airborne troops could be reinforced within a few hours by guns and tanks from the beaches.

These considerations had led First Army to conclude almost as soon as it began planning the UTAH operation that an American airborne division should be employed behind the beaches to support the UTAH landing. Montgomery so far approved the plan as to include it in his presentation on 21 January, and at first Leigh-Mallory welcomed it as a change from the airborne operations in the Caen area for which, he said, he had never cared.<sup>18</sup>

Thus endorsed, the drop behind UTAH Beach was duly established in the NEPTUNE† Initial Joint Plan issued on 1 February. According to that plan a second airborne division would attack within twenty-four hours after the first, but whether its objective would be in the British or the American sector was still under discussion. The British continued to want an operation near Caen to hold the line of the Orne, and General Bradley was much interested in plans to place an American airborne division on the west side of the Cotentin. Plans for a third airborne operation were left indefinite because, although four airborne divisions and several smaller units were on hand, it was very doubtful whether there would be enough troop carrier aircraft for three large-scale lifts. On

\*See Map No. 3, p. 37.

†About this time the code word NEPTUNE came to be used for the assault on Normandy, the term OVERLORD being restricted to later phases of the invasion or to the invasion as a whole.

\*This postponement was welcome to Leigh-Mallory, who had already requested such a delay to provide more time for troop carrier training.

24 January Leigh-Mallory had pointed out the hard fact that he had only enough planes to carry one division at a time. The attrition of two hazardous operations might reduce the number of troop carriers operational to a much lower level.<sup>19</sup>

As a result of this situation renewed efforts to get additional troop carrier strength had been made during January. Proposals for expansion of 38 Group won support from the Prime Minister, Winston Churchill, and by 23 February had been approved by the Air Ministry. The Group was to be raised in time for NEPTUNE to a strength of 212 first-line aircraft and 36 reserves.

Meanwhile Eisenhower had appealed to Washington for aircraft and crews sufficient to provide IX Troop Carrier Command with a striking force of 832 planes plus 208 reserves. The AAF had a shortage of trained crews and barely enough C-47's in prospect to meet his request after filling existing commitments. Nevertheless, on 31 January the Operational Plans Division of AAF Headquarters worked out a solution. The departure of the last troop carrier group scheduled for spring delivery would be speeded so that it would have time to participate in preparations for OVERLORD. The troop carrier groups in England would be expanded by 1 April from 52 aircraft and crews apiece to a recently established T/O strength of 64 plus 9 in reserve. Thus IX Troop Carrier Command would have 13½ groups with 986 aircraft available for OVERLORD. On 19 February the War Department formally notified Eisenhower that these measures had been approved.

Ultimately Washington found it possible to send enough additional crews so that over 1,100 were in England at the time of the invasion, but the basic planning for the airborne operations in NEPTUNE was on the basis of the February estimates.<sup>20</sup>

While the wheels of the War Department were turning to supply additional troop carriers for OVERLORD, AAF Headquarters produced a plan for a large-scale airborne operation deep in enemy territory. Prepared by Brig. Gen. Frederick W. Evans, head of I Troop Carrier Command, and Col. Bruce W. Bidwell of the Operational Plans Division, this plan was approved by General Marshall, on 7 February and flown to England a few days later.

With it went a letter from Marshall in which, while disclaiming any desire to exert undue pres-

sure, he expressed to Eisenhower his strong personal support of the project. He criticized previous airborne operations as piecemeal, indecisive, and narrowly conceived. As for objections to the plan on grounds that nothing like it had been done before, he commented ". . . frankly that reaction makes me tired."<sup>21</sup>

The enterprise which so appealed to him was a parachute and glider assault between Evreux and Dreux by two reinforced airborne divisions on the night of D minus 1. In that area, some 70 miles east of Caen and 40 miles west of Paris were four large airfields. These would be seized and used for airlanding of two additional reinforced divisions before daylight on D plus 1. At least 1,250 tons a day of supplies would be delivered by 600 C-47's flying by night and 200 heavy bombers operating by day. The initial objective of the airborne troops after consolidating their position would be the Seine crossings below Paris. All of these were within striking distance of the airhead.

General Eisenhower gave the plan full consideration, but at a meeting with his subordinate commanders on 18 February he went on record as rejecting it. His objections were based on the immobility of the airborne troops after landing. This, together with their limited firepower and lack of armor, might permit the Germans to surround and destroy them if the forces in the amphibious assault were not able to move rapidly to their assistance. He also feared that their aerial resupply might be seriously interrupted by weather or enemy action. Eisenhower's view was that the time for such massed and deep penetrations by airborne forces would come when the Allies were established on the Continent and in position for a breakthrough.<sup>22</sup>

Since in actuality the Allies were unable to break out of their Normandy beachhead for a month and a half after D-day, Eisenhower's fear that under the Evans plan his airborne forces might be destroyed before ground assistance could reach them seems justified by events.

After 1 February planning responsibility for NEPTUNE passed from SHAEF to the appropriate army and air force commanders. The proposals of the former for airborne operations were presented at an interservice meeting on 23 February. There General Bradley won a second decision in favor of the use of an airborne division behind UTAH Beach. His emphatic statement that seiz-



ure of the exits from the beach was vital to his assault plan outweighed protests from Leigh-Mallory that the area near UTAH was not well suited to glider operations and was defended by perilously large numbers of anti-aircraft installations.

The lift of an American airborne division to take the UTAH causeways would require 800 of the 1,154 troop carrier aircraft which were to be available.\* The commanders agreed on the 23d that the remaining 354 planes should go to the British for missions carrying two brigades on D minus 1 to take or destroy bridges east of Caen. The two brigades (each roughly equivalent to an American regiment) would have a very tight squeeze.

Both Bradley and Dempsey wanted their airborne troops delivered on the night of D minus 1. Leigh-Mallory conceded that paratroop operations would be possible by moonlight but reserved judgment on the feasibility of glider landings at night. He also disliked the idea of having to furnish fighter escorts for two simultaneous airborne operations.

General Bradley had proposed that a second American airborne division be dropped and landed in an area on the west side of the Cotentin northwest of La Haye du Puits after the first two airborne missions were completed. Leigh-Mallory argued that zones south of La Haye were preferable, and decision on that point was postponed. On 2 March the Initial Joint Plan was amended to provide specifically for three airborne operations, but the exact timing and location of the second American assault was left open.<sup>23</sup>

Shortly thereafter it was settled that this operation would take place, as Bradley desired, northwest of La Haye du Puits on the night of D-day/D plus 1. North of La Haye, entrance to the west side of the Cotentin had to be gained through a four mile strip of dry land west of the Douve marshes or over a causeway two miles east of St. Sauveur de Pierre Pont. If one airborne division could block that bottleneck, while another seized or destroyed the bridges over the Douve in the UTAH area, the Cotentin would be effectively sealed against either the reinforcement or the escape of its Nazi garrison. However, since the La Haye area was more than 20 miles away from UTAH Beach, it might be several days before

American ground forces could reach it. Because of this prospect of hard fighting in an isolated position the experienced 82d Airborne Division was chosen to strike there, and the operation in the UTAH sector was given to the 101st Airborne Division.

The commanders agreed that the British airborne operation east of Caen could be handled by 38 Group and 46 Group. However, because of the small size of the British troop carrier force, IX Troop Carrier Command might have to assist it if further missions by the British airborne were undertaken. Later it was planned that the troop carrier command might help carry the British 1 Airborne Division in an operation after D plus 6 or make an emergency drop of a British paratroop brigade to reinforce the beachhead. However, it was never called upon to carry out those missions.<sup>\*24</sup>

### **Detailed Planning**

After 23 February detailed study of the proposed airborne operations was begun by the Airborne Operations Staff, AEAFF and by the staffs of IX Troop Carrier Command, 38 Group, and the airborne divisions, with the Airborne-Air Planning Committee serving as a central forum. The most heated controversy arose over the question of whether to attempt glider missions at night.

The troop carriers and Leigh-Mallory stood together against this and against landings at daybreak as involving excessive operational difficulties. They proposed that the gliders of the 101st Division be landed at dusk on D minus 1, but this was ruled out as forewarning the enemy of the main operation. On the other hand, General Bradley insisted on having 260 gliders landed by early morning of D-day to facilitate the capture of Carentan. Impatient with objections of the air commanders, he declared that if gliders could not carry out missions in the proposed areas they were of no value as weapons of war, and that if the

\*Since the British and American airborne missions to Normandy were geographically and tactically separate, and since the Americans did not participate in the British missions, further discussion of British operations will be limited to matters of mutual concern and to brief comments for purposes of comparison.

For accounts of the British airborne operations in Normandy see Air Ministry (A.H.B.) *Airborne Forces* (London, 1951); Richard N. Gale, *With the 6th Airborne Division in Normandy* (London, 1948); and Hilary St. G. Saunders, *The Red Beret* (London, 1950).

\*Assuming a force of 986 American and 398 British planes of which 230 planes would be held in reserve.

glider troops of the 101st could not be delivered and ready for action before noon on D-day, he would prefer to take them in by boat. Maj. Gen. Matthew B. Ridgway, commander of the 82d Division, also wanted his glider echelon brought in as early as possible, preferably with the paratroops, to provide artillery\* against possible panzer attacks.<sup>25</sup>

Up to the middle of April it appeared that Bradley and Ridgway would have their way, that 260 gliders would land at dawn in the 101st Division's operation and 410 gliders would participate in the initial assault of the 82d Division. However, doubt was cast on the feasibility of this procedure by a test landing under realistic conditions at dawn on 18 April. Although only one major accident occurred there were many minor ones, and only half of the 48 gliders involved in the test could be flown away. On the 24th the issue was still in doubt, but by the 28th all gliders had been omitted from the initial missions and a new plan established under which the paratroops of both divisions would go in on the night of D minus 1. At dawn on D-day each division would be reinforced by about 50 gliders. Such small missions would be easy to escort, could be landed quickly and would not crowd small landing areas. Another glider mission would be delivered at dusk for the 82d Division and others thereafter at times as yet undetermined.<sup>26</sup>

The number of gliders to be sent in the evening on D-day was the subject of some misunderstanding and dispute. At first General Williams supposed it had been set at 150, while Bradley's staff held out for 200. Finally, late in May, it was decided that 176 gliders should be sent at that time for the 82d Division and 32 for the 101st. Later missions to the 82d Division, being both safer and less urgent, had been agreed on by the end of April. One mission of 100 gliders would go early on the morning of D plus 1, and another 100 would arrive at dusk. A parachute resupply mission by 185 planes would be flown on the night of D plus 1, and another parachute or glider mission of indefinite size would be flown on the next night.<sup>27</sup>

The main features of the American airborne operations seemed to have been settled; however,

\*Only two or three battalions of parachute field artillery were available and events in Sicily had raised doubts as to whether they could be used effectively.

late in May they had to be radically revised as a result of defensive measures taken by the enemy. Until the spring of 1944 the Germans had concentrated on defense of the Pas de Calais and neglected Normandy. Then Hitler in one of his flashes of intuition called attention to the likelihood of Allied invasion of Normandy or Brittany, and in April German intelligence analysts substantiated his suggestion. While still inclined to think that the main assault would be elsewhere, the High Command recognized that Normandy was in danger and that the Cotentin was peculiarly suitable for an airborne operation.<sup>28</sup>

One answer to this threat was to fortify Normandy to the point of impregnability. Fortunately for the Allies the Germans lacked time, men, and materials to do the job thoroughly, but the Cotentin did break out with a rash of entrenchments and obstacles. These were particularly dangerous to the 82d Division. One of the drop zones originally selected by it was later described by Brig. Gen. James M. Gavin, as "the most thorough job of anti-airborne organization I have ever seen."<sup>29</sup>

Photographic reconnaissance confirming these developments caused anxiety but no change in plan. Late in May came more serious news. The Germans had reinforced the 243d and 709th Divisions, already known to be in the Cotentin, with the 91st Infantry Division, the 6th Parachute Regiment and some lesser units. Thus German reinforcements, which it was the mission of the 82d Airborne to bar from the Cotentin, were already there in sufficient strength to give the 82d a very hard fight. The move also increased the chances that the 101st Airborne would meet strong opposition. If so, that division, which had been assigned to take an area of some 40 square miles containing 14 important objectives, might need some assistance.<sup>30</sup>

The possibility of such a situation had not been entirely unforeseen, and obviously the solution was to shift the 82d Division into a position where it and the 101st would be mutually supporting. On 26 May the old plan was canceled. On the 27th a meeting was held at Bristol to make a new one. First Army proposed that the 82d Division be dropped near the town of Ste Mère Eglise to cover the right flank of the 101st, but VII Corps, which was in charge of the UTAH assault, preferred to have the division placed west of the Merderet to establish bridgeheads over that river.

This had the virtue of keeping the two divisions far enough apart to avoid confusion during the paratroop drops, but there were not enough good drop and landing zones on the west side of the Merderet for a whole division. The outcome was a compromise by which two paratroop regiments of the 82d would drop on the west side of the river and one near Ste Mère Eglise. At first all gliders of the 82d Division were to land southeast of Ste Mère Eglise, close to the paratroops of the 101st, but later it was arranged that the initial glider mission of the division should land northwest of that town in position to make quick contact with the paratroop regiment there. Only one change was made in the plans of the 101st Division, but that was important. Hitherto a single battalion of the 506th Parachute Infantry Regiment (PIR) had been assigned to cover the southern perimeter of the division. Now the 501st PIR, previously assigned to take Ste Mère Eglise, was shifted south to reinforce that sector. It had proved possible to change drop and landing zones without changing loading plans, but the timing and route of the missions had to be revised.<sup>31</sup>

The staff of the 82d Division, well aware of the increasingly hazardous nature of their original operation, welcomed the new one "without a single regret."<sup>32</sup> On the other hand, the situation led the already pessimistic Leigh-Mallory to lose all faith in the chances of the American airborne operations. The AEAF commander appealed to Eisenhower in person and in writing to cancel the missions on the ground that enemy antiaircraft might shoot down half the parachute force and 70 percent of the gliders, and that the reinforced German troops would overwhelm such airborne forces as succeeded in landing. Eisenhower, though much perturbed, refused to accept the recommendation. He considered that the airborne missions were feasible and that their risks were warranted by their value. Without them the UTAH landing might fail, and its failure would cripple the whole assault. Therefore the Supreme Commander took the responsibility for having the missions carried out.<sup>33</sup>

Until May, planning for the protection of the airborne missions had of necessity remained unsettled pending decisions on the nature and timing of the missions themselves. The Allied commanders, particularly Leigh-Mallory, had been anxiously aware throughout their planning of the

danger presented by German aircraft and antiaircraft. It was conservatively estimated during the spring that the Germans would have at least 850 usable aircraft in northwest France on D-day and that over 200 of them would be first-line fighters.\* This later proved an accurate estimate. Allied airmen hoped to cripple these forces by pounding their airfields, but had little expectation of knocking them out. They anticipated that as many as 1,000 sorties a day might be made by the GAF. Since German warning radar was capable of picking up the troop carrier formations more than 30 miles off the coast, the risk of fighter interception in daylight missions, particularly glider missions, appeared great. German night fighters were not numerous in Normandy but had to be watched for. Antiaircraft fire was considered very dangerous. The whole tip of the Cotentin north of a line from les Pieux to Quineville was known to be infested with light and heavy guns, and intense fire was to be expected all along the east coast.<sup>34</sup>

To protect the airborne operations against these perils the Allies relied on avoidance, deception, and powerful air support. By 12 April IX Troop Carrier Command had planned and won approval for a route which avoided most antiaircraft concentrations by entering the Cotentin through the back door.

The assembly point of the 52d Troop Carrier Wing was to be about 20 miles east of Birmingham. From there the serials of that wing would fly southwest for 60 miles to the head of the Severn estuary and south for another 60 miles to the Command Assembly Point ELKO. The assembly points of the 50th and 53d Wings were respectively 23 miles west-southwest and 28 miles northeast of ELKO. From the Command Assembly Point all units would fly south-southwest for 30 miles to the Command Departure Point (FLATBUSH), at the tip of the sandy cape called Portland Bill. Thence they would go straight on over the sea for 57 miles to a point at 49° 45' 30" N, 02° 56' 30" W (HOBOKEN) at which they would make a 90 degree turn to the left and fly a 54-mile leg between Alderney and Guernsey, just out of range of the antiaircraft on either island, to the Initial Point

\*Some later estimates, based on German efforts to conserve strength during the spring, were more pessimistic. On 5 June Ninth Air Force calculated that the Germans had 1,099 usable aircraft, including 634 fighters, in position for employment against OVERLORD by D plus 1. (Ltr, Hq 9th AF Adv to CG 9th AF, Subj: Estimated Scale of Effort of the G.A.F. Against Operation "OVERLORD," 5 Jun 44, in 533.451-632A.)

(PEORIA) on the west coast of the Cotentin about six miles north of the towns of Carteret and Barneville. Although the coastline there was not particularly distinctive, PEORIA was on the straightest possible route to the objectives. Directly ahead about 11 miles away was the area northwest of La Haye which was then the destination of the 82d Division. A slight turn to the left at the IP and a 25-mile flight would bring the 101st Division to its drop and landing zones behind UTAH Beach. Rather than risk passing over the anti-aircraft batteries along the east coast and the Allied convoys off UTAH Beach all serials were to turn to the right after accomplishing their mission and return on a reciprocal course.

Discovery by German warning radar was to be delayed as long as possible by keeping below 1,500 feet over England and descending to 500 feet over the Channel. On reaching Normandy the troop carrier formations would climb to 1,500 feet to reduce the effectiveness of small arms fire. The route had the added virtues of avoiding the dense concentrations of aircraft operating from eastern and central England and giving a wide berth to the Allied convoys headed for Normandy.

The Allied naval commander agreed to set up a 10-mile safety corridor along the route, to notify his forces of the missions, and to instruct them that troop carrier formations on proper course and schedule were to be allowed to pass without challenge. Important as this precaution was, it was considered secondary to keeping the troop carriers out of range of the convoys.<sup>35</sup>

The revolution in troop carrier plans at the end of May necessitated certain changes in route. The concentration of German troops near the neck of the Cotentin, and the shift of the 82d Division's zones to the east exposed the troop carrier formations to greatly increased risks from ground fire during their flight across Normandy. With surprise and darkness in their favor the groups carrying paratroops could risk crossing the peninsula on the way in, but it was tempting providence to have them return the same way. Consequently, between 27 and 30 May they were given a new homeward route out over the east coast to the St. Marcouf Islands (PADUCAH), then over the water northward for 16 miles and west-northwest for 78 miles to rejoin the outward route at a check-point (GAL-LUP) 28 miles from Portland Bill. Such a course had been proposed previously by troop carrier

planners but had been vetoed by naval representatives.

In order to separate the approach routes of the two divisions and thereby give the paratroops of the 82d Division a better chance to achieve surprise, the route of the 101st Division's paratroop mission from HOBOKEN to the mainland was swung slightly southward so that landfall would be made at an IP (MULESHOE) near the village of Portbail. The village and the inlet on which it was located provided excellent checkpoints. The run from MULESHOE to the drop zones of the 101st was 22 miles straight ahead with the Douve and Merderet rivers providing several landmarks along the way.

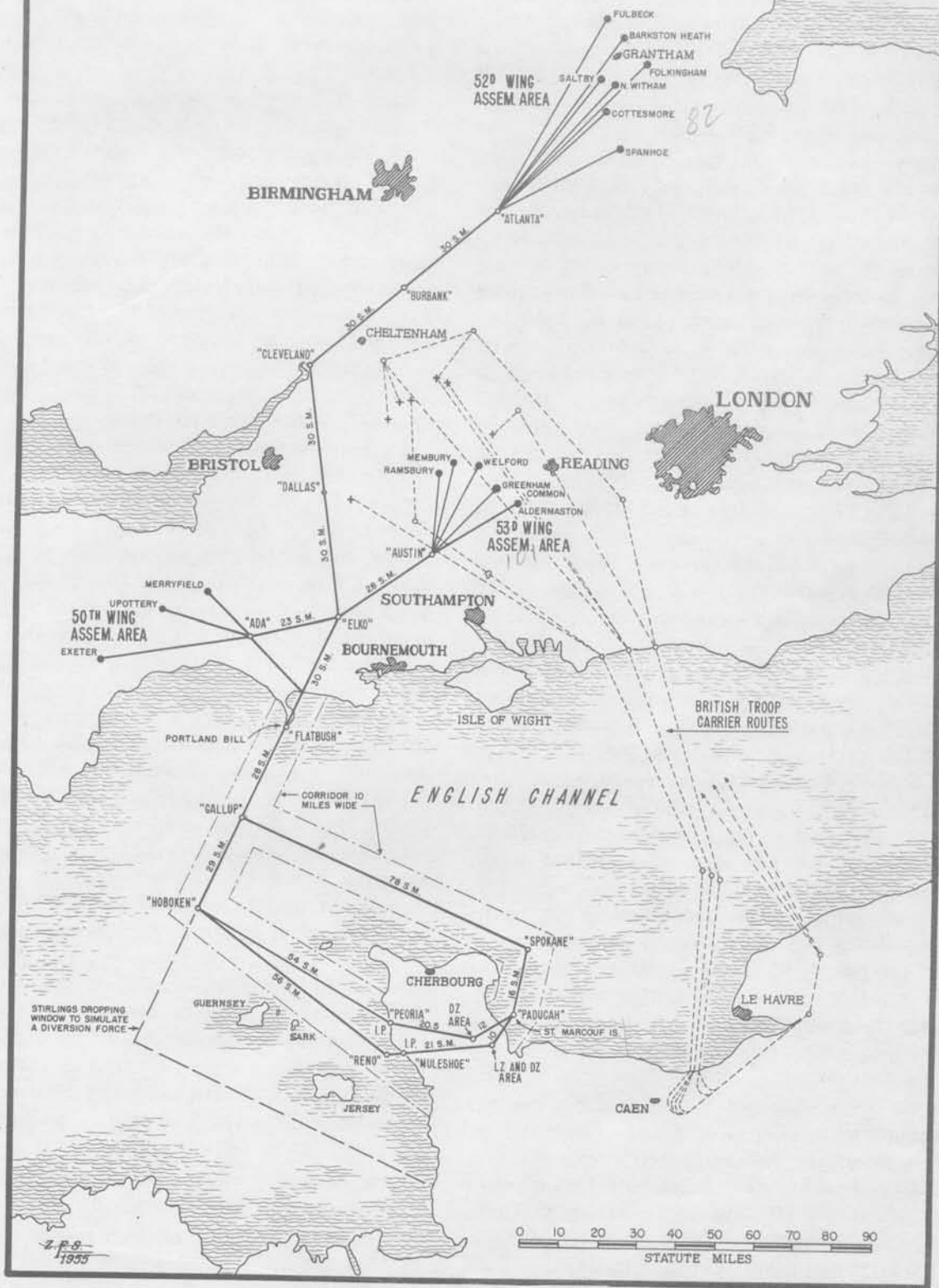
Later, after strenuous discussion, the planners agreed that the glider missions of the 82d and 101st at dawn on D-day should follow the same routes as the paratroop missions. The dim light of the early morning was relied on to protect their approach. Not until 31 May was it decided that subsequent glider and resupply missions, rather than fly across the Cotentin by daylight, were to approach their zones from the east side of the peninsula, following the route by which the earlier missions had returned, and that they would go back the same way.<sup>36</sup>

The new course entailed new risks. While it avoided the convoys as much as possible, some missions would pass over the UTAH assault area. The troop carrier spokesmen, fearing a barrage from the ships, asked for an absolute prohibition on naval anti-aircraft fire at times when airborne missions were scheduled to pass overhead. The admirals objected on the grounds that a German air raid on the convoys might coincide with the passage of troop carrier formations. However, because of the importance attached to the airborne missions, the Allied naval commander did accept the new routes and imposed on the naval gunners the prohibition requested by IX Troop Carrier Command.<sup>37</sup>

While under the revised plans the close proximity of troop carrier and naval operations made aircraft recognition very important, the troop carriers were limited to the use of visual recognition procedure. In case of challenge they could respond with Very pistols and Aldis lights, but they were forbidden to use IFF except when ditching. Early in April SHAEF had established a committee to study the possibility that the huge number of AI-

# Operation NEPTUNE

## ROUTES OF TROOP CARRIER MISSIONS



Map 1.

lied aircraft employed in the invasion might saturate the IFF system and cause it to break down. The committee reported on 2 May that without severe restrictions on the use of IFF such a result was to be expected. Consequently an interservice meeting on 9 May agreed to limit the use of IFF in the invasion mainly to night-fighters and carrier-based planes.<sup>38</sup>

One way to distinguish Allied aircraft from those of the enemy was to paint them with distinctive markings. In early May IX Troop Carrier Command was still thinking of camouflaging its planes, but since the decision not to use IFF made visual identification almost essential, it was ruled that certain types of aircraft including the troop carriers would be marked. Some SHAEF experts questioned whether it would be worthwhile to paint gliders as well as aircraft, but on 17 May Leigh-Mallory decreed that this, too, would be done. The pattern chosen for troop carrier craft consisted of three white and two black stripes, each two feet wide, around the fuselage back of the door and from front to back on the wings. To familiarize the naval forces with these markings an exercise was held on 1 June in which marked aircraft were flown over the invasion fleets. However, for security's sake, general marking of planes and gliders was not ordered until 3 June (D minus 2). It proved an arduous task which in many groups occupied all available troop carrier personnel far into the night.<sup>39</sup>

Security dictated that the paratroop missions arrive under cover of darkness. However, to help the troop carriers keep formation and enable the airborne troops to assemble after jumping, bright moonlight was considered highly desirable. This consideration, together with others relating to the amphibious assault had led Eisenhower early in May to pick 5 June as D-day. It was the first day after the 1 June target date that would be preceded by a moonlit night. Should a postponement prove necessary, the light on the next two nights would also be satisfactory.

To conceal themselves as far as possible, the paratroop formations were to reduce their lighting to a minimum, particularly over enemy territory. It was agreed in April that navigation lights would be turned off 10 miles from the British coast, downward recognition lights off at HOBOKEN, and formation lights dimmed at HOBOKEN until barely visible. They would be turned on again at

the same points on the way back. After the homeward route was changed GALLUP replaced HOBOKEN as the place where recognition and formation lights would be turned on again. Flame dampeners were relied on to hide the light from the exhaust.<sup>40</sup>

Leigh-Mallory had suggested in March that smoke might be used to shield the troop carrier formations. A test held on 12 April indicated to at least one observer that laying sufficient smoke to protect large missions would take more effort than it was worth. However, at the wish of the airborne commanders plans were made to lay smoke for the relatively small glider missions to be flown at dawn on D-day. On 17 May the Ninth Fighter Command agreed to provide six A-20's at that time to blanket five miles of coast north of Cape Carteret for ten minutes. A strafing of enemy positions was to precede the smoke-laying.<sup>41</sup>

The employment of deception and diversionary operations in support of OVERLORD had been considered by Allied planners as early as 1943, but not until 14 April 1944 did 21 Army Group present the AEAF commanders with a definite plan. A force of Stirlings was to simulate paratroop drops in coastal areas north of the Seine at about the time of the first British airborne missions on the night of D minus 1. WINDOW would be used to give the effect of a large force of aircraft to enemy radar, and dummy paratroops, rifle fire simulators and pintail bombs would be dropped. It was later agreed that a few SAS troops\* would be dropped to add realism. Meanwhile a dozen Stirlings were to screen the actual operations by jamming enemy warning radar all along the north coast of Normandy and six others would jam fighter control stations. While 38 Group was given control of the diversions, it had no planes to spare, so the necessary units were to be obtained from RAF Bomber Command.<sup>42</sup>

The American airborne commanders showed little interest in diversionary operations. However, by early May plans had been formulated to fly six Stirlings with the first paratroop mission. One would accompany the lead ship of each of the first six serials as far as HOBOKEN. Instead of turning there they would continue straight to the coast of Brittany, dropping WINDOW as they went to simulate a force of six troop carrier serials.

\*Specialists dropped to perform demolitions or to work with Resistance forces.

Late in the month a decision was made to screen this operation by jamming enemy radar on the northwest corner of the Cotentin and in the Channel Islands. Accordingly, on 3 June, AEAF requested the 803d Special Squadron from the Eighth Air Force to do the jamming.<sup>43</sup>

Final coordination of all plans for radio countermeasures was supervised by an advisory group directly under the British Air Ministry. This was established by SHAEF on 15 May, too late for major changes of plan. However, the simulated British airborne missions were later integrated with naval feints at Cap d'Antifer and the Boulogne area to give the effect of a coordinated airborne and amphibious assault. Also, the Stirling feint in conjunction with the first American mission was altered. It was to turn left a few miles after passing HOBOKEN and head for the Coutances area in Normandy instead of Brittany. By thus closely paralleling the troop carrier route the feint was more likely to achieve deception and to distract the German garrison of Normandy. Responsibility for radio countermeasures during the critical 30 hours preceding H-hour was delegated by SHAEF to the Allied Naval Commander of the Expeditionary Force.<sup>44</sup>

In early May plans for air support of the American airborne missions called for preliminary bombing, halted at twilight on D minus 1 to avoid hampering the troop carriers by fire or heavy smoke along the route. The paratroop missions that night would be protected by 15 British night fighters attacking searchlights and gun positions, 6 patrolling the coast around the IP, and 8 acting as escort. Similar protection was to be given the dawn glider missions on D-day. In addition all the glider missions were to be given daylight escort on a ratio of one fighter group for every 50 gliders.

By the end of the month changes had been made. Night fighters were to provide cover for the paratroop missions over the Channel. In the interval between the pathfinder drop and the arrival of the main force in the first paratroop mission, bombers would attack points in the Cotentin to draw flak and searchlights, and the positions thus revealed would be attacked by a dozen night fighters. While the paratroop missions were over Normandy interceptors equipped with AI radar would patrol in relays of six between enemy airfields and the troop carrier route at altitudes of 5,000 to 8,000 feet, and two or three squadrons

of intruders would orbit over the enemy airfields. All these tasks were to be performed by the RAF.

On 22 May VIII Fighter Command accepted responsibility for support of the first two glider missions, but when the route of those missions was changed at the end of May it was apparently released from that task. About the middle of May IX Fighter Command agreed to provide three fighter groups as close escort for the twilight glider mission on D-day and to support glider and resupply missions on D plus 1 on a similar basis.

Coordination of planning and control of air support for the airborne missions was in the hands of a Combined Control Center at Uxbridge to which AEAF had delegated control of all fighter operations in the initial phase of the invasion. Controllers from RAF 11 Group would direct the British, and IX Fighter Command would provide controllers for the Americans.<sup>45</sup>

The planners, vividly remembering how missions to Sicily had been thwarted by faulty navigation, were almost more afraid of that than of enemy guns. They saw to it that the troop carrier route was marked like an avenue as far as HOBOKEN, and they sought to provide as much guidance as possible from there to the zones.

The British Navy had promised to provide a 110-foot MT boat and a smaller craft to act as markers, one at GALLUP, the other at HOBOKEN. The boats were to keep in position by using a radar system called Gee.\* Navigational aids in England and on the boats were to be set up and operated by IX Troop Carrier Command.

For visual guidance aerial lighthouses known as occults were to be put at 30-mile intervals from the 52d Wing's assembly point to Portland Bill, and the marker ships were to have green holophane lights. Eureka beacons would be placed at all wing assembly points, the head of the Severn estuary, ELKO, FLATBUSH, and the marker boats. This list includes all points outside enemy territory at which there would be a change of course. In addition a beacon known as the BUPS, would mark the English coast at FLATBUSH and the important over-water turn at HOBOKEN.<sup>46</sup>

To guide the missions across Normandy much reliance was placed on navigational aids to be set up on the zones by teams of pathfinder troops flown in half an hour ahead of the main serials.

\*See below, p. 16.

The pathfinder planes were to locate the zones by conventional navigation assisted by Gee (PPF) and SCR-717C (PPI) radar.

Gee, which had been used successfully by RAF bombers in 1943, was a British radio system in which position was determined by triangulation. Navigators observed the sequences of pulses received from three stations and checked their results against a map on which the lattice lines marked the distribution of pulse patterns. Gee was effective to ranges of over 100 miles, ample for the Normandy missions. However, very precise interpolation was needed. Some experts held that errors of over 2,000 feet in range and 1,500 feet in deflection were to be expected, but troop carrier plans for NEPTUNE assumed a probable error of 400 yards. More anxiety was felt about Gee's vulnerability to jamming, which would be effective at distances up to 15 miles.

The SCR-717, an American product, was an airborne radar sender-receiver, which scanned the landscape with its beams. The reflected beams produced on the scope a crude outline map in which water seemed black, while land and shipping appeared lighter. It would thus provide a recognizable map of the Channel Islands and the Normandy coast.

The first installation of Gee on an American troop carrier aircraft was made in mid-January 1944. By the end of the month the command had decided to use it, and by 23 February the Ninth Air Force agreed to equip 108 troop carrier planes fully and 44 others partially with Gee. It is interesting that on 25 February General Williams, who had no experience with Gee in the Mediterranean but was full of confidence in Rebecca, offered to give up all or most of the Gee equipment if it were needed for bombing. This concession was not called for, and IX Troop Carrier Command got its quota of Gee sets.

On 8 January 1944 the command had requested samples of SCR-717, and on 4 February the War Department promised to give it 16 sets by the middle of March, including 5 which were already installed on planes of the 52d Wing. More were to be sent thereafter as they became available. However, because of production difficulties IX Troop Carrier Command had only 11 planes with this equipment on 9 April, and only about 50 sets arrived in time for use in the invasion. The first experimental installation of Gee in a C-47 having

SCR-717 was made on 9 April. By fast work all or most of the other planes with SCR-717 had also been equipped with Gee before D-day. Even so, there were only enough such planes for the pathfinders and for one or two of the leaders in each serial.<sup>47</sup>

The aids to be set up by the pathfinder teams on the zones consisted of BUPS and Eureka beacons, lights, panels, and smoke.

The BUPS, a supplement to the SCR-717, was a responder beacon designed to react to the beam of the SCR-717 as a Eureka beacon did to that of Rebecca. The blip produced by its response on the scope of a SCR-717 provided an orientation point from which a navigator could get his bearings and to some extent his range. Six BUPS beacons arrived in England in April and May. Tests made in England indicated that the BUPS could be dropped with pathfinder troops and used by them. Consequently, besides the two at FLAT-BUSH and HOBOKEN, arrangements were made to send in two with the pathfinders. One was to be set up on the most central zone (DZ C) and used throughout the paratroop jumps and the dawn glider missions as an orientation point for the entire drop and landing area. Another was to be used to guide resupply missions for the 82d Division.<sup>48</sup>

While the BUPS was regarded as an experiment, Rebecca-Eureka was heavily relied on to guide the approach of night missions. Eureka beacons were to be set up on every zone, and all aircraft employed by IX Troop Carrier Command were equipped with Rebecca. In February IX Troop Carrier Command had expected to have 650 Rebecca sets. A month later it was counting on 750. On 22 March word came from Washington that 200 more sets would be delivered by 1 May and 300 by 1 June. This pledge was fulfilled.

Though the supply of Rebecca was ample, its employment was restricted by technical considerations. Experts decided that simultaneous use of several hundred sets would cause failure through oversaturation. Therefore, its use in the airborne missions was to be limited to flight leaders, that is to about one pilot in nine in the paratroop formations. Even these were to turn off their sets between HOBOKEN and points 20 miles short of their zones and between the zones and points 30 miles out on the return trip. Stragglers and leaders of straggling elements were authorized to use Re-



becca but only in emergency, presumably if they were lost or hopelessly separated from their serial.

Radar experts also feared that interference and confusion might arise among the Eureka's, since six closely grouped beacons were to be used in rapid succession. Transmitting and receiving channels for the Eureka's were carefully chosen to minimize the chance of interference, and their signals were coded so that if received by the Rebeccas of a serial for which they were not intended, they could be distinguished from those of the correct beacon. As a further precaution, each Eureka was to be turned on at a specified time, in most cases 15 minutes before planes were due at its zone, and turned off 20 minutes after the pathfinders considered that the drop or release on that zone was completed.

One weakness of the Rebecca-Eureka was a tendency of the transmitter pulse on the scope of the Rebecca to merge with the blip from the Eureka a mile or two before the beacon was reached, thus ending the instrument's effectiveness and causing premature drops and releases. For this reason the troop carriers in NEPTUNE were directed to determine their drop or release point not by Rebecca but by visual observation of lights, panels and smoke, set up to mark the zones.<sup>49</sup>

For night missions lights were to be used. They were to be set up on each zone in the shape of a T with the stem 30 yards long, parallel to the line of flight of approaching serials, and head 20 yards across. The pathfinders would place a Eureka 25 yards beyond the head of the T. Each T was to be lit by 5 specially designed holophane lights which shot narrow beams of light about 2 degrees above the horizon in the direction from which the planes would come. They were also visible from above through frosted panes in the top of each light. The lights on the three drop zones of the 101st Division were to be green, red, and amber respectively; so were those on the zones of the 82d Division; while all of the three glider landing zones were to have green lights. Both for security and to prevent confusion, the lights on a given zone were not to be turned on until six minutes before planes were due there and were to be turned off as soon as the drop or release on that zone was considered complete. The scheduling of the serials was such that there seemed hardly a chance that two T's of like color would be on at the same time for the paratroop missions. There was, however, a strong

likelihood that green lights for different glider missions would be on simultaneously, since at dawn and dusk on D-day missions for both airborne divisions were to arrive in quick succession. This opportunity for error may have been discounted because it seemed settled that those missions would have some sunlight to assist them. As an additional means of identification, the lights on each drop or landing zone were to flash in code the letter identifying that zone.

For daylight missions, zones were to be marked by fluorescent panels 3 feet by 15 feet in size, arranged to form T's and identifying letters, and by colored smoke. Each zone would have its own color combination of panels and smoke.

Emergency resupply missions were to be called for by placing one long and one short panel in line pointing toward the desired zone. Such missions could also be requested by radio by an air support party through Ninth Air Force Headquarters at Uxbridge. No provision was made for direct radio contact between the airborne troops in Normandy and the planes engaged in follow-up missions. Moreover, to provide maximum security for the airborne and amphibious landings, complete radio silence was imposed from the start of the invasion until H-hour, which was ultimately set at 0630 on D-day.<sup>50</sup>

Thus stood the plans at the end of May, a carefully constructed and comprehensive structure. Flaws there might be, but until revealed by combat experience they were scarcely visible.

## **The Buildup**

The preparations of IX Troop Carrier Command for OVERLORD were favorably affected by a strong transfusion of experienced officers into its headquarters and adversely affected by an influx of new and green personnel into its flying units.

The command expanded its staff from about 100 officers in January to over 150 by the middle of March. Most of the newcomers had served in the Mediterranean either with the 52d Troop Carrier Wing or on the staff of the XII Troop Carrier Command, which had been dissolved on 20 February, the cream of its officers being sent to England. About half of them went into the A-3 Section, which grew from 17 to 33 officers, and into Communications, which expanded from 13 to 21 officers.<sup>51</sup> Man for man, the experience of the

contingent from the MTO in handling airborne missions was unparalleled in the AAF or, indeed, in any other air force with the possible exception of the German Luftwaffe. Naturally, the already strong influence of Mediterranean doctrine and methods on IX Troop Carrier Command became increasingly dominant.\*

Most important of the personnel changes was the assumption of command on 25 February by General Williams, former chief of XII Troop Carrier Command, in place of General Giles. Lt. Col. James C. Pruitt, who had been Williams' Signal Officer in the MTO, had arrived ahead of him and had been installed as Communications Officer early in February. Within a week after taking command General Williams named a new A-1, Lt. Col. Owen G. Birtwistle, formerly with the 52d Wing, and a new Deputy Chief of Staff, Col. Peter S. Rask, who had held a corresponding post in XII Troop Carrier Command.

Col. Ralph E. Fisher, who joined the command in April and became A-3, was a comparative outsider, though favorably known to Williams. With Fisher in the A-3 Section were two veterans from the MTO, Col. Glynne M. Jones, former A-3 of XII Troop Carrier Command, and Lt. Col. John W. Oberdorf, who had also held that position for a time. Both played an active and influential role in planning the coming airborne operations. In close contact with them was Col. Ralph B. Bagby, former Chief of Staff of XII Troop Carrier Command. He had been assigned to Headquarters AEAF, put in their Operations Section, and given charge of their troop carrier planning.

Three major holdovers provided IX Troop Carrier Command with an element of continuity and a valuable knowledge of the administrative intricacies of the ETO. The Chief of Staff, Col. James E. Duke, Jr., had held his post since December 1943. The A-2, Lt. Col. Paul S. Zuckerman, and the A-4, Col. Robert M. Graham, had held theirs since October 1943 when the command was in its infancy.<sup>52</sup>

When Williams took command the field strength of IX Troop Carrier Command was growing fast. What had been little more than an advance party in 1943 was being built up to a point where it could undertake large-scale training in March

1944. In the first two months of the year the 436th, 437th, and 438th Troop Carrier Groups, part of the 439th, and Headquarters, 53d Troop Carrier Wing had come from the United States. In addition most of the air echelon of the 61st, 313th, 314th, and 316th Groups and Headquarters, 52d Wing, which commanded them, had flown up from the Mediterranean. By the end of March the rest of the 439th, the 440th, 441st and 442d Groups had arrived from the United States, and all of the 52d Wing and its four groups had come from the MTO, as had 47 planes and crews for the 315th Group. The command had attained its full complement of 13½ groups and 3 wing headquarters.

However, at that time it had on hand only about 760 crews and 845 aircraft. Its strength was built up to 1,076 qualified crews and 1,062 operational aircraft by the end of April, and raised to 1,116 qualified crews, and 1,207 operational aircraft at the end of May by flying in additional crews and planes from the United States. This action provided a sufficient force and reserve for all airborne missions to be undertaken by IX Troop Carrier Command in NEPTUNE. However, it should be remembered that of 924 crews which IX Troop Carrier Command was committed to send on missions before H-hour on D-day about 20 percent would have to be inexperienced filler personnel who had been overseas less than two months.<sup>53</sup>

The groups from the United States brought with them their T/O complement of 104 glider pilots apiece, so, although the 52d Wing was somewhat short of glider personnel when it arrived in the United Kingdom, IX Troop Carrier Command had pilots and co-pilots for 618 gliders by 31 March, not counting the glider pilots of the 442d Group, then en route from the United States. As it turned out, this was enough. However, had the large glider operations which First Army desired been approved and others tentatively arranged with the British been carried out, the supply of glider pilots would certainly have run low. In view of such a situation IX Troop Carrier Command had requested late in January that an additional 700 glider pilots be sent from the United States as replacements. Drastic steps were taken to step up the rate of advanced glider training and some pilots were diverted from other theaters with the result that 380 pilots reached the United Kingdom in late March and early April and 215 more

\*However, policy was shaped by experts from all possible sources. For example, Lt. Col. M. C. Murphy, formerly director of the Advanced Tactical Glider School, was an active and helpful adviser in glider matters.

arrived in May, giving IX Troop Carrier Command enough for 951 gliders on the eve of OVERLORD.<sup>54</sup>

One potentially grave personnel shortage existed in IX Troop Carrier Command. With planes and combat crews more than a third overstrength, ground personnel had been left at T/O level. However, because the ground crews were mostly fresh and enthusiastic and materiel mostly new and in good condition, this situation, although it caused some anxiety, did not appreciably impede operations in OVERLORD.<sup>55</sup>

Of the planes themselves over three-quarters were less than a year old as of 1 June, and all were in fine condition. All old engines had been replaced, thus eliminating a prime cause of abortive sorties. During the winter, supply shortages had been frequent, but by late May, time, effort, and high priorities had given the troop carriers all the items they needed for their planes with one exception, self-sealing fuel tanks.

The command had asked in February for personnel armor and self-sealing tanks. Thanks in part to lend-lease assistance from the British they got armored seat-pads for their pilots and copilots, and flak helmets, armored vests and aprons for all crew members. Seat-pads and armored clothing were also procured for the pilots and copilots of the gliders. The request for self-sealing tanks was turned down; General Arnold, himself, ruled in February that they could not be spared for troop carrier use. Information in April that about 75 such tanks might be available roused IX Troop Carrier Command to new efforts to get at least enough to equip its pathfinders, but these attempts, too, were in vain.<sup>56</sup>

The troop carriers had plenty of gliders on hand before the end of April 1944, largely because provision for them had been made well in advance. Before the end of July 1943 General Arnold, who then believed that gliders would be a decisive factor in the assault, had ordered the shipment of 1,441 Waco gliders to the United Kingdom. About the same time the British, who expected to have some 1,600 Horsa gliders on hand by the spring of 1944, had pledged a minimum of 300 of them to the AAF. These quotas were later made even larger. By February 1944, 2,100 Waco gliders had been shipped to England.

On 31 May, after considerable attrition in training IX Troop Carrier Command had 1,118 opera-

tional Waco gliders and 301 operational Horsas.<sup>57</sup> However, before so many gliders had been made available delays in the assembly of the Wacos had threatened to upset the troop carrier training program. Except for the first shipment of Waco gliders, which had arrived unexpectedly in the United Kingdom in May 1943, Wacos were stored at Crookham Common about 40 miles southwest of London. Attempts to use the nearby base of Aldermaston for assembly proved unsatisfactory because of transportation difficulties, so Crookham came to be the center for assembly as well as storage of Waco gliders. While spacious and fairly well located, Crookham Common lacked facilities for efficient glider assembly and was so windswept that completed gliders were in constant danger of being wrecked.

During the summer of 1943 Eighth Air Force delegated the care and assembly of incoming gliders to untrained British civilian workers with the result that of the first 62 gliders they attempted to put together 51 were unflyable. In September the 26th Mobile Reclamation and Repair Squadron was given the assembly job. In October the IX Air Force Service Command took over the base and unit. Inexperienced, ill-equipped, and undermanned, the squadron managed to assemble about 200 gliders out of a quota of 600 before the end of 1943. It failed to speed up appreciably during the next three months and was set back by storms, which damaged over 100 completed gliders. On 26 March 1944 IX Troop Carrier Command, which even then had less than 300 usable Wacos, appealed to IX Air Force Service Command to raise glider output to 20 a day. The response was a promise to produce 30 a day. Many additional personnel, including an experienced engineer officer who was to reorganize assembly methods, were sent to Crookham Common. For its part the troop carrier command arranged to have the gliders flown away promptly after completion to prevent them from accumulating. Working a seven-day week, the men at Crookham assembled 910 Wacos in April, and the danger of a glider shortage vanished.<sup>58</sup>

During late April attention shifted to glider modification, including the installation of parachute arrestors, landing lights, glider-plane intercommunication sets, and especially the Griswold nose, a framework designed to protect the Waco and its contents in a crash-landing. On 29 April

IX Troop Carrier Command requested that the Griswold nose be installed in all of 500 Wacos still awaiting assembly at Crookham. Later it agreed to have production reduced to 10 gliders a day in order to get that modification done. In addition it sent out service teams to put the Griswold reinforcement on gliders at its own bases. By 27 May 288 Griswold noses had been installed. Two or three days later work at Crookham was halted and the mechanics there were sent to the troop carrier bases to help the overburdened glider mechanics in their final preparations.<sup>59</sup>

Although British lashings for Horsa cargoes arrived late, the only important Horsa equipment not received in time for the invasion was  $1\frac{5}{16}$ -inch nylon tow ropes, of which 960 had been ordered from the United States on 10 February. Three months later none had arrived, and the troop carriers urgently requested that 100 sets be sent by air. Only a few incomplete sets arrived, and  $1\frac{1}{16}$ -inch rope had to be used. Fortunately, it proved to be a satisfactory substitute.\*

Late in April, inspections revealed decay around

\*Unlike the Waco, which was towed by a single rope hitched to the nose, the Horsa had a Y-shaped tow rope with 350-foot stem and 75-foot arms hitched to either wing.



Figure 1. Paratrooper Boarding a C-47.



Figure 2. Paratroop Officer Demonstrates Jump Position.

the stern posts of many Horsas, and a crew of 100 civilians was hastily set to repairing them. Also during the late spring the Horsas were being modified so that their tails could be removed if the doors were jammed or blocked. By the end of May mechanics of IX Air Force Service Command had made this change on 257 of the Horsas in American possession.<sup>60</sup>

### Deployment and Training

On 6 February SHAEF had directed IX Troop Carrier Command to prepare in conjunction with the airborne commanders an intensive training program to culminate early in May in exercises with an airborne division. The goal of the training was to enable the troop carriers to fly night paratroop missions to within a mile of an objective and to fly glider missions by twilight or moonlight to a given landing zone in formation and within a minute of schedule. By 26 February such a program had been worked out. It called for intensive joint training with airborne troops to begin on 15 March.\* Later the plan was revised

to meet General Williams' feeling that training should be made more realistic and that a larger proportion of the program should be devoted to exercises with American airborne units, since all scheduled missions were to be with them.<sup>61</sup>

Until 1944 it had been assumed that IX Troop Carrier Command would fly its missions from fields in the northeast of England. Its headquarters had been established at Grantham in Lincolnshire, and the bases it was to use in the invasion were grouped around that town. There its units could practice in relative security from enemy air raids and would not interfere with the bomber and fighter units so tightly packed in the southeast of the island.

However, preliminary studies had shown that glider missions would stand a much better chance if based near the south coast, because they would be less exposed to bad weather and nearer to their objectives. These points applied particularly to Horsa missions, since towing them taxed a C-47 to the limit. Accordingly arrangements were made in January to move a wing containing five groups to fields in southern England. Ramsbury and Welford Park were quickly obtained, and by 17 February authority had been given to take over the neighboring fields of Greenham Common, Membury, and Aldermaston. All five were excellent bases. They were located about 50 miles from the south coast and between 50 and 70 miles west of London. The 53d Troop Carrier Wing was picked to occupy them.

Up to the end of February 1944 IX Troop Carrier Command had no intention of seeking more



Figure 3. Cockpit of a Waco Glider.



Figure 4. Jeep Emerging from Nose of Waco Glider.

than five southern fields. The decision to lift two American divisions and the requests of those divisions for glider missions produced a change. On 3 March General Williams announced at a meeting of Ninth Air Force commanders that if his command was to fly 400 gliders in the assault phase of OVERLORD, it would need five additional fields in southern England from which to launch them. Within a week the RAF had agreed to provide five fields in the southwest near Exeter, and on 16 March a meeting at AEAF Headquarters selected Exeter, Upton, Merryfield, and Weston Zoyland for use by the American troop carriers as tenants of the RAF. The 50th Wing was designated to occupy them. No suitable fifth field was found, although several were proposed then and later.<sup>62</sup>

Throughout the training period, the 52d and 53d Wings were closely paired with the divisions they were to carry in NEPTUNE.\* When the 53d moved to its southern bases it found its partner, the 101st Division already established close-by. Divisional headquarters was at Greenham Lodge, only a mile or so from wing headquarters at Greenham Common. The divisional commander, Maj. Gen. William C. Lee, one of the pioneers of airborne warfare, was incapacitated by illness in March. His place was taken by Brig. Gen. Maxwell D. Taylor, Divisional Artillery Commander of the 82d Division, an officer who had won much experience and a fine reputation in the Mediterranean. In mid-February the 82d Division had

\*The 50th Wing was able to work with the 82d Division until it moved south in April, but its southern fields had been acquired too late to make good arrangements for training there with the airborne.

moved from Northern Ireland to the Leicester area within easy commuting distance of the bases into which its partner, the 52d Wing, was then moving. Divisional headquarters was set up at Braunstone Park in Leicestershire. The 82d's commander was Maj. Gen. Matthew B. Ridgway, who had directed the 82d throughout its campaigns in the Mediterranean.

Both divisions were remodeled to provide the powerful paratroop punch expected of them in Normandy. The 101st had come overseas with one parachute regiment, the 502d. Now it had the 506th PIR assigned and the 501st PIR attached to it; it lost one of its two glider regiments, retaining the 327th.

The 82d Division had left one of its two parachute regiments in Italy. This unit, the 504th PIR, which had suffered severely at Anzio, did not reach the United Kingdom until May and was not ready for use in the invasion. However, as compensation, the 507th and 508th PIR's were attached to the division in January to supplement its veterans, the 505th PIR and the 325th Glider Infantry.<sup>63</sup> Thus the airborne divisions, as used in Normandy, were in effect quadrangular with three parachute and one glider regiment apiece.

The joint training program could not be uniform. It had to be adjusted to the missions and proficiencies of the various troop carrier units as well as to the training policies and geographic accessibility of the airborne troops. As a result each wing and to some extent each group of troop carriers received different training.

The 53d Wing had been selected to specialize in glider operations but would have to be ready for possible paratroop commitments. To aid its preparation for this dual role, it was given the only four groups in the command which were intact and fully operational at the end of February. Of these, the 434th and 435th Groups had already flown many paratroop and glider exercises in the United Kingdom. The 436th and 437th were well qualified for paratroop work but had had only rudimentary training with gliders. By 3 March these four groups had been assigned to the wing and moved to their tactical bases, Aldermaston, Welford Park, Membury, and Ramsbury. The 438th Group, which joined the Wing at Greenham Common on 16 March, was not operational until April.<sup>64</sup>

During early March the 53d Wing put its fliers

through a series of paratroop exercises with simulated drops, and on the night of 12 March executed a successful drop of a parachute regiment. The wing made a spectacularly good drop on 23 March in the presence of Eisenhower, Brereton, and Churchill and a still better one on the night of 12 April. These performances won the confidence of IX Troop Carrier Command in spite of the fact that in a night exercise on 4 April heavy clouds with bases at 1,000 feet had caused three out of four serials of the 53d to abort and the other to disperse and to drop inaccurately. The wing ended its work with paratroops on 18 April, because its partner, the 101st Division, decided its troops had jumped enough.

All groups of the 53d Wing did some training with gliders during March, and the 434th and 437th Groups, which were picked to specialize in glider operations, reached the point where they could fly glider formations at night. After some experimentation the 437th concluded that the most satisfactory formation was the pair of pairs in echelon to the right. Glider training in the 53d Wing rose to such intensity during April that the wing logged 6,965 hours of glider towing that month. The effects of this work were shown in an exercise on 21 April when pilots, most of whom had towed a Horsa for the first time less than seven weeks before, released 241 out of 245 Horsas at their proper landing zones after a long flight. For the first three weeks of May the wing continued glider training with increasing emphasis on night formations and on landings at dawn in areas less than 400 yards in length. The final verdict of IX Troop Carrier Command was that it was fully qualified for its coming role.<sup>65</sup>

Between 11 February and 5 March almost all the air echelon of the 52d Wing, including the flying personnel of the 61st, 313th, 314th, and 316th Groups flew from Sicily to England via Marrakech and Gibraltar with a loss of only one out of 221 planes. The rear echelon arrived by boat on 18 March. The remnant of the 315th Group in England was assigned to the 52d Wing on 17 February. In March the 315th's two squadrons in North Africa returned to the ETO and the group also received 26 aircraft with experienced crews transferred from troop carrier units in the Mediterranean to bring it up to strength. These crews later were organized into two new squadrons. Attached to the 52d Wing in May for operations and train-

ing was the 442d Group, which had arrived from the United States between 26 and 29 March and had been assigned to the 50th wing.

During the training phase the groups of the 52d Wing were concentrated within a 15-mile radius of Grantham, except for the 315th, which was at Spanhoe 22 miles away. Wing headquarters and the 316th Group were at Cottesmore, the 61st at Barkston Heath, the 313th at Folkingham, the 314th at Saltby and the 442d at Fulbeck. All bases were connected by good English roads and when completed had all necessary facilities including hard-surface runways in the 6,000-foot class. The notoriously bad spring weather of northern England often interfered with flying. However, enough time had been provided so that the training of all but the 315th and 442d Groups was completed with time to spare.

The quality of the 315th and 442d Groups was very different from that of the other four. The others had flown so much that there was a danger they would go stale. Their pilots had an average flying time of well over 1,500 hours when training began. Most of them had been overseas for more than ten months and had flown paratroop missions. The fliers of the 315th Group had equally impressive amounts of overseas and flying time, but its two original squadrons had been employed for ten months on routine transport work and never had had much training for airborne operations. Also, the group, having been built up from various sources, needed time to develop teamwork. The 442d was a very green unit. Activated in September 1943, it had had only one or two C-47's per squadron until December. Its training in the United States, hampered by winter weather, and curtailed to meet the schedule for OVERLORD, had included almost no night formation flying or dropping of paratroops.<sup>66</sup>

The 52d Wing had been selected to fly the paratroops of the 82d Division into Normandy. Since its bases were too far north to be suitable for glider missions, the wing concentrated on paratroop work. Nevertheless, it spent 4,207 hours in April and May towing gliders and demonstrated in a daylight glider exercise on 29 May that it could fly glider missions if necessary.

The 61st and 316th Groups were able to make actual drops of paratroop battalions on 18 March. The 313th and 314th Groups, hampered by construction at their fields, flew no exercises until

April. By the end of that month all four were considered ready, although the 313th and 314th had done badly in three night drops.

Meanwhile the 315th and 442d had not begun training programs until 3 April, and had spent that month mostly in formation flying. They flew no exercises and dropped no troops until May. By then the American airborne divisions had almost wound up their jumping program and were not eager to risk accidents by further parachuting. Fortunately, the 82d Division had some men who had not completed their quota of jumps, and additional exercises were scheduled for the nights of the 5th and 7th of May. In the former both groups had loose formations and the 315th drifted off course. In the latter, flown in cloudy weather by the 315th, assembly, formation and drop were all unsatisfactory.

EAGLE, the command rehearsal on 11-12 May, had been intended as the final exercise of the training period, but IX Troop Carrier Command recognized that the 315th and 442d Groups needed more work and felt that the 314th had not yet proved itself in night operations. The performance of the three groups in EAGLE bore out this opinion. Accordingly the 314th was given another night paratroop exercise on 14/15 May, and the training periods of the 315th and 442d were extended to 26 May at which date they, too, made night paratroop drops on a token basis. The three exercises were so completely successful as to indicate that even the least experienced groups would be ready for NEPTUNE.<sup>67</sup>

Last of the troop carrier wings to enter intensive training was the 50th. During the winter it had been at Bottesford in command of the groups subsequently given to the 53d Wing. In their place it received the 439th Group on 25 February and the 440th and 441st Groups on 21 March.\* None of these groups had been in existence for more than nine months. All had arrived from the United States within a few days of their assignment to the wing. The 439th was stationed at Balderton, the 440th at Bottesford, the 441st at Langar. The three fields were in the northern group and were all within about five miles of IX Troop Carrier Command headquarters at Grant-ham. Some formation flying was done in daytime during March, despite wintry weather, but the

\*The 442d Group was also assigned to the 50th Wing but its training has been discussed in connection with the 52d Wing.

wing's training program did not really get under way until the beginning of April. At that time an inspector observed that all groups in the 50th lacked practice in night formation flying and that most of the navigators were inexperienced and ignorant of all radar aids, even Rebecca.<sup>68</sup>

During April each of the groups had a different program. The 439th specialized in glider towing and became skillful enough to fly night formations with gliders. It carried out four glider exercises by daylight with good results. In its only paratroop exercise everything went wrong, and the drop was far from the DZ. The 440th flew one successful daytime glider exercise, and executed four paratroop drops, the last three of which were very good. The 441st Group, which had dropped paratroops only twice in its short life, carried none in April. It concentrated on day formation flying until the tenth and on night formations thereafter but did make a very accurate resupply drop on the afternoon of the 21st.

During the last week of April the 50th moved to southwest England. Wing headquarters and the 440th Group went to Exeter, the 439th to Upton about 15 miles northeast of Exeter, and the 441st to Merryfield some ten miles northeast of Upton. All were fine large bases with long hard-surface runways. Although some construction was still going on at all three fields, they were ready for use.

During early May the 50th Wing carried on intensive training, including two simulated wing paratroop drops at night. No troops were actually dropped, because the 101st Division had finished its jump training except for EAGLE and was averse to doing more. Although the wing did well in EAGLE, it was considered to be in need of further practice. Since there were no paratroops to drop, it flew four more night exercises with simulated drops between 18 and 29 May. These were carefully designed to resemble actual operations, and lights were flashed to indicate when the jump signal would have been given. The results were good. Besides these exercises a heavy schedule of other flying training was continued until the 29th of May. By then the 50th Wing, too, was rated as ready for action.<sup>69</sup>

Besides the three wings, another organization, the Command Pathfinder School, was engaged in an even more exacting training program. The development of a separate pathfinder organization

seems to have been a gradual process. The success of RAF bombers led by Gee-equipped pathfinders inspired the command to begin training navigators at Bottesford in the use of Gee about the end of January. The school had one radar officer, a second lieutenant, and four instructors with one Gee ground trainer, three Gee ground sets, and two Gee-equipped aircraft. Early in February the arrival of five planes from the MTO equipped with SCR-717C made it possible to begin training with that instrument. By 12 February IX Troop Carrier Command had decided to include both Gee and SCR-717 training in one Command Pathfinder School.

To secure more room and better facilities the school was moved to Cottesmore. On 26 February Lt. Col. Joel L. Crouch, who had planned and led pathfinder operations in Italy, was named as Commandant (one of General Williams' first appointments in IX Troop Carrier Command), and on the 28th the school officially opened. Cottesmore, which also housed the 316th Group and 52d Wing headquarters, proved to be too congested, so on 22 March the pathfinders were moved to North Witham, about ten miles south of Grantham.<sup>70</sup>

Early plans for large-scale radar training had to be whittled down for lack of equipment and instructors. Aircraft with SCR-717 already installed trickled in one by one from the United States. Men trained to use or repair the SCR-717 were scarce and tools with which to repair it were scarcer.\* Although Gee was more plentiful, and the RAF had provided instructors and mechanics to help the Americans get started, test equipment and parts for it were hard to get. Consequently the first class had to be limited to 24 crews, 3 from each of the 8 troop carrier groups then in England. A few more were included after the course started. These were to be trained intensively for 60 days. If time and facilities permitted, another class would be trained later in the spring. Whole crews were enrolled on the grounds that much better results could be attained by a team working together than by a trained navigator whose comrades were ignorant and perhaps skeptical of his new techniques.

\*The first shipment of materiel for installation of SCR-717 did not arrive in England until 18 May, and 18 trained radar officers requested by IX Troop Carrier Command in March did not arrive until 28 May. (Journal, IX TCC Comm Off, 18, 28 May 44 in 546.901A; Rpt, IX TCC Comm Off, 20 May 44, in 546.116.)



By the end of March the students had completed ground training and had an average of 60 hours flight instruction and practice with the new instruments. Most of them were deemed skillful enough to graduate from basic instruction and to concentrate on perfecting their technique in practice missions. Therefore on 6 April, 24 more crews were called in for training. Since this expansion required additional equipment, IX Troop Carrier Command decided to allot the pathfinders 52 aircraft, including the 11 equipped with SCR-717 which were then on hand and all of the same type subsequently received by the command. The rest of the 52 planes were to be equipped with Gee and, after the successful installation of a Gee set in a plane with SCR-717, all aircraft so equipped were also provided with Gee.

As early as 18 March pathfinder planes had participated in exercises and dropped paratroops with Eureka beacons and visual aids. However, in several early exercises the Rebeccas in the troop carrier aircraft were ineffective because they were badly tuned or even set for the wrong channel. The pathfinder school requested and was given the responsibility for designating channels and for the tuning of Rebecca-Eureka equipment. With precise tuning this radar improved remarkably thereafter in reliability and in range. Some poor performances had occurred because the paratroop pathfinder teams dropped to operate the Eureka had only limited knowledge of their instruments and were ignorant of troop carrier plans and procedure. Therefore 300 pathfinder personnel from the American airborne divisions were sent to North Witham to study and work with the troop carrier pathfinders. This also produced dividends in greater efficiency and better teamwork.

By 10 May the second batch of crews had completed their basic training, and 14 fully trained crews were returned to the groups to lead serials in EAGLE. Lack of coordination in EAGLE between those 14 crews and the serials they were supposed to lead resulted in a decision to keep at North Witham only 24 crews for further training and return the rest to the groups to get practice as leaders. The aircraft of the 28 crews which were returned had to fly to North Witham every three days for servicing and current radar data, but the move was probably a wise one. Reintegrated into their groups, and usually with group commanders

or executive officers as pilots, most of these ex-pathfinders did well in NEPTUNE.

By D-day, all navigators at the pathfinder school had operated Gee for at least 25 hours and were considered qualified operators. Most had had from 15 to 45 hours training with the SCR-717C and could easily identify the image of a coastline on its scope. However, using the SCR-717 to orient oneself over inland areas was much more difficult and few if any were prepared to do this with assurance.<sup>71</sup>

The command exercise, EAGLE, deserves attention both as the nearest thing to a true rehearsal held for any American airborne operation in World War II, and as a test to determine whether IX Troop Carrier Command could carry out its controversial and perilous role in NEPTUNE. EAGLE was originally an exercise of the 50th and 53d Wings with the 101st Division, but late in April after the 82d Division paratroop mission was moved up to follow immediately after that of the 101st, the exercise was revised to include the 52d Wing and the 82d Division and to correspond as closely as possible to the whole sequence of pre-H-hour airborne missions as then planned. It was also postponed from the 7th to the 11th and 12th of May so that all units would be ready to participate.

The main route to be flown ran from March, the 52d Wing assembly point, westward for 159 miles to Cefn Llechid in Wales, then south for 50 miles to a marker boat in the Bristol Channel, and east for 55 miles to Devizes, which was the IP. Eureka and beacon lights were spaced at intervals along the way, including all assembly points and turns. In addition BUPS beacons were provided on the marker boat and at Devizes. Drop zones were to be marked by pathfinder troops essentially as they would be in the invasion. Simulated glider landing zones in the tactical area were to be marked by T's, but after some debate, it had been settled that the gliders would simply be towed over these zones and land in comparable areas marked out on airfields, thus avoiding possible crashes and recovery problems.

The rehearsal began on the night of 11 May with the take-off of seven pathfinder serials from North Witham half an hour ahead of the main serials. Four pathfinder serials got excellent results; two did well; one lost its way in a haze, which in places limited the visibility to three miles. When it did reach its zone it was so late that the

troops it carried were unable to get their equipment into action in time to direct the 315th Group, which was the first scheduled to drop there.

After the pathfinders came 19 paratroop serials spaced at 6-minute intervals. The parachute echelon of the 101st Division was flown by 432 aircraft in 10 serials, half from the 53d Group and half from the 50th. The first jump was to take place at 0033. The serials of the 53d Wing were uniformly successful. Those of the 50th also did creditably, except that one flight from the 440th Group fell out of formation, missed its drop zone in the haze and returned without making a drop.

The paratroops of the 82d Division were carried by 369 planes of the 52d Wing in nine serials. Unlike the 101st Division which, having prepared the operation long in advance, sent over 6,000 jumpers, the 82d was able to provide only token loads of two jumpers per plane. One serial, that of the 442d Group, broke up on the way. Only 16 of its 45 aircraft got to the vicinity of the drop zone and dropped troops. The rest, lost in the haze, returned to base on orders from group headquarters and tried again at dawn. The Eureka lights on the zone were off at the time and the 442d, baffled, dropped its paratroops 10 miles away. The other serials reached the drop area approximately on course and on schedule, and six did well. However, the aids on the zones of the 314th and 315th Groups were not on when they arrived. Most of the 314th made a second pass, saw the T, which by then had been lighted, and dropped troops on it. However, nine pilots had given up and gone home, and another nine made drops by guesswork far from the zone. The 315th Group, although it finally received some signals, was too disoriented to make use of them and returned without making any drop.

Only two glider serials were flown in EAGLE. They were spaced 10 minutes apart from head to head and consisted of 52 planes each from the 434th and 437th Groups, towing a mixture of Wacos and Horsas. The first glider was to be released at 0529, ten minutes before civil twilight.\* Seven pilots of the 434th lost their way in the dark, but the 437th released all but one of its gliders at the proper point. The landings were considered good.

\*Civil twilight begins in the morning when there is enough sunlight to see by. The sun is then about 6 degrees below the horizon.

The effect of EAGLE was to induce a mood of optimism as far as troop carrier capabilities were concerned. Williams, who had already declared that, barring unexpectedly heavy flak or failure by the pathfinders, 90-100 percent of the paratroops in IX Troop Carrier Command's Normandy missions would land in the correct area, was confirmed in his opinion. Even Leigh-Mallory stated that he was highly impressed.<sup>72</sup>

Since in general the experienced groups had done very well, and the only serious failures were by the inexperienced 315th and 442d Groups, the lesson seemed to be that further training of the weak sisters was the only thing needed to insure good performance, at least as far as the paratroop operations were concerned. (The attitude toward the initial glider missions remained a mixture of opposition and fatalistic resignation.) This optimism was related to neglect of a major variable in the situation, namely the weather. Time and time again in big and little exercises during the past two months, and in several previous missions, wind and low visibility, particularly at night, had scattered troop carrier formations, twisted them off course or spoiled their drops. Yet the halcyon weather in EAGLE seems to have pushed all this into the background. The field orders for EAGLE had contained full and specific precautions against bad weather. Those for NEPTUNE were to be notably lacking in such precautions. Even the requirements of security and the need to send in the NEPTUNE missions under almost any conditions cannot fully explain this neglect.

### **Final Preparations**

Final troop carrier preparations began with the completion by IX Troop Carrier Command of Field Order 1, NEPTUNE-BIGOT, at 1500 on 31 May. Although as yet few knew it, D-day had been set for 5 June, and the first planes were to be on their way over the Channel before midnight on the 4th. The 52d Wing at Cottesmore was so close it could pick up the orders almost immediately and have its own order out next day. Copies for the 50th and 53d Wings were flown to them, those for the 53d arriving at Greenham Common about 2300 on the 31st. Working continuously the staff of the 53d Wing issued the first part of its order at 0800 on 1 June. The 50th Wing issued its field order at 0800 on 2 June. By 1400 that afternoon

the 53d had the last annexes to its order ready for distribution. Group field orders, being hardly more than extracted copies of the command and wing orders, came out almost immediately after the wing orders. Some groups relied on wing orders and issued none of their own.

The troop carrier command had obtained ample supplies of maps from First Army and distributed them to the wings. The maps of Normandy were on a scale of 1:50,000, those of the troop carrier routes and objective areas on a scale of 1:25,000. One innovation was the addition of 1:25,000 photographic maps of routes and zones as they would appear at night.

The wings received photographs from IX Troop Carrier Command at about the same time as the field orders. Coverage included run-in strips, obliques of landfall areas, and mosaics of drop zones and landing zones. These were identical with the photographs used by the airborne units. An agreement had been reached in March to consolidate airborne and troop carrier requests for photographic reconnaissance and to have photographs and overlays standardized so that they could be used interchangeably by both parties.

On 29 April, just after completion of the Tactical Air Plan, IX Troop Carrier Command had arranged to have experts from Ninth Air Force make terrain models of run-in and objective areas on a scale of 1:25,000 and of some particularly important places on a scale of 1:5,000. They had begun work on 4 May. Changes in plans after 26 May had required additional models, particularly for the new zones of the 82d Division, but by 1500 on 3 June all models were ready, and copies were on their way to the wings, which in turn loaned them out to their groups for briefing purposes.<sup>73</sup>

Except that one officer representative from each wing had participated in planning since about the beginning of March, IX Troop Carrier Command had carefully restricted information on its impending missions to a small group of specially cleared officers on its own staff. A high-level briefing of troop carrier officers was scheduled for 20 May but was postponed, and during the last five days of the month the unsettled state of planning made briefing impossible. On the 31st Leigh-Mallory announced that high-level briefing could begin and Williams called a meeting for the next day. This was held at Northolt in the briefing room

of Advance Troop Carrier Headquarters and was attended by wing and group commanders plus four or five key staff officers from each wing and two or three, usually the S-2, S-3, and Communications Officer, from each group. The briefing was thorough, possibly too much so, since there were no less than a dozen speakers including Williams, Brereton, Ridgway, a British representative, a naval representative, and various other experts.

After returning from Northolt the group commanders of the 50th Wing held briefings for additional members of their staffs and for squadron commanders, S-2's and S-3's on 2 June. With minor differences most other groups appear to have done likewise.

Formal briefing of flying personnel was done on a group basis, although additional briefing was done by squadrons. Each group had its own schedule and procedure. Some began briefing on 3 June, some on the 4th, and some, learning that operations had been postponed 24 hours, set back their schedules accordingly and began briefing on the 5th.

When a single group was sending out 90 planes and some 400 men it was obviously undesirable to brief all its crews at once. In general, groups sending two serials briefed each separately, and the pilots, co-pilots and navigators of a serial were usually briefed separately from the radiomen and crew chiefs, who were given only limited and special information. Many of the pilots' briefings were addressed by airborne officers and attended by jumpmasters of the units they were to carry. To avoid unduly long meetings some groups split their data and saved part of it for later sessions. On the evening of D minus 1 final briefings were held from which in most cases the crews went directly to their planes. Not until those last meetings was the time of the mission announced. The briefings were generally rated as very good and the information in them thorough and accurate, as might be expected considering the unparalleled time and effort devoted to collecting it. During the last two or three days General Williams flew from group to group giving short talks to staff members and flight leaders. These, however, were "pep talks" rather than briefings.<sup>74</sup>

Between 28 May and 1 June the airborne divisions had moved onto the airfields from which they were to be flown. There they bivouacked in the most isolated spots available behind heavily

guarded barbed wire. The service troops keeping house for them were also isolated. On the arrival of the airborne units the troop carrier men were restricted, and so were the large numbers of British civilians living in the base areas. Current business provided pretexts for a surprising number of special passes, but the movement of military and civilian gossips and possible spies was successfully halted. Before briefing began, the bases were sealed to almost all personnel. Personal phone calls were prohibited, and all calls were monitored; pay phones were discontinued, and personal mail was put in special bags and stored until after D-day. All briefed personnel were segregated in special quarters under officer guards who escorted them even on trips to the latrine. Wing and group war rooms were also put under 24-hour guard, and so were the marshalling areas during the servicing and loading before take-off.

The need for strict security in connection with airborne missions had always been recognized, but these measures were the strictest yet imposed. The fact that restrictions had been ordered during EAGLE and on several other occasions kept the uninitiated from realizing that something unusual was going on. Those who knew what was planned could not talk to those who did not, and many men at the bases learned with surprise after the planes were in the air that the long-awaited invasion had begun. While some surmised what was coming, they were unable to verify their surmises or to disseminate them outside the bases.<sup>75</sup>

English weather, famed for its unpredictability, nearly upset the entire invasion. Transports were at sea, the troop carrier bases had been sealed and the crews and their airborne passengers were being briefed when the high command found itself faced with the agonizing necessity of postponing NEPTUNE perhaps indefinitely.

The SHAEF weather forecast on 3 June for the 5th, which was to be D-day, was unexpectedly bad. It predicted winds of 17 to 22 knots, thick clouds below 500 feet and a four-foot surf on the Normandy beaches. Such winds were too high for paratroop drops. The low visibility would make the towing and landing of gliders next to impossible. Even amphibious landings would be hazardous in the high surf. Two anxious meetings by the principal Allied commanders ended with Eisenhower deciding to wait six hours for a new forecast. This was worse than the last, and about

0415 on the 4th he ordered the invasion postponed for 24 hours.

At 2115 on the 4th the commanders met again and were told that a sudden shift in the weather pattern gave promise of an interval of relatively good weather for the next two days. Beyond that the outlook was dubious. There remained a certainty of heavy surf, and a likelihood of high winds and low clouds. However, waiting another day was more likely to forfeit what opportunity there was than to gain better conditions, while further postponement was an appalling prospect because the next date suitable for the amphibious operations would be the 19th, which fell at a phase of the moon unsuitable for airborne missions. Moreover, the problems involved in keeping the force in readiness for two weeks more and still maintaining secrecy were staggering. It seemed better to gamble on the 6th. "I don't like it," said Eisenhower, "but I don't see how we can possibly do anything else." Leigh-Mallory liked it even less. Stormy weather and low visibility could play hob with all the missions assigned the AEAFF. However, he conceded that given the expected lull, air support could be provided and airborne missions would be practicable. Thus the invasion was set to take place on 6 June unless some new and extraordinary difficulty arose. The paratroops, its advance guard, would set out on the night of the 5th.

### **Deception and Diversion**

In return for the trouble it gave them, the weather rewarded the Allies a hundredfold by giving them an extraordinary opportunity for tactical surprise. Since the Germans had no outposts in the Atlantic to report the coming lull, they believed that storm conditions would shield them from invasion for several days. Consequently they were caught with their patrol boats in harbor and their reconnaissance planes on the ground.<sup>76</sup> The only means by which they could know of the approaching armadas was by radar.\* Along the invasion coast they had warning stations at average intervals of approximately ten miles. The best of these had a maximum range of 150 miles at high altitudes and could pick up low-flying aircraft

\*They did intercept BBC messages alerting the French resistance, but Rommel's army group staff, which was responsible for the defense of Normandy did not take them seriously and apparently did nothing to alert its subordinates.

at a distance of 30 to 35 miles. In the normal course of things the operators would discover the troop carriers at least half an hour before they reached their objectives.

Beginning on 10 May, the AEAFF, occasionally assisted by Eighth Air Force and Bomber Command, RAF, had conducted a bombing campaign to knock out these radar stations. They were hard to hit, and the effort devoted to them was limited by other and heavy commitments and by a rule that, to preserve security, two stations outside Normandy would be hit for every one inside it. On the other hand the stations were only moderately defended and scantily camouflaged, and none of the long-range sets were mobile. By D minus 1 the system had been hammered until, according to subsequent Allied estimates, it was no more than 18 percent operative and few, if any, sets were functioning between Le Havre and Barfleur. In addition, the headquarters of German signal intelligence in northwest France had been bombed out on the night of D minus 3.

Against the punch-drunk remnant of the German warning system the Allies employed a three-point program of countermeasures, jamming of warning and night fighter radar in the invasion area, simulation of an invasion north of the Seine, and simulated paratroop drops just far enough from the American and British drop areas to confuse the enemy as to the true location of his airborne assailants. In these operations 105 planes, mostly RAF bombers, were employed and three were lost.

Despite bombing and jamming, German radar apparently caught brief, ambiguous glimpses of mine-sweepers off the coast and troop carrier formations off Cherbourg, but was unable to see enough to recognize their full significance. Some troops may have been alerted as a result, but no general alarm was given until a majority of the airborne troops had landed.

The fake invasion consisted of a few ships and planes using WINDOW and other devices to simulate two large convoys headed respectively for the Le Havre and Boulogne areas and troop carrier serials making a drop a few miles from Le Havre. The airborne and seaborne feints at Le Havre, though well executed, had little effect, but that at Boulogne drew a violent reaction. The Germans opened up with searchlights and guns on the supposed convoy and between 0100 and 0400 sent 24

night fighters against a patrol of 29 WINDOW-dropping bombers which was simulating air cover for the convoy. Thus at the very time when they might have been slashing at the troop carrier columns over Normandy, most of the Nazis' small stock of night fighters in northwest France were chasing will o' the wisps off the mouth of the Somme.

The influence of these threats of invasion between the Seine and the Straits of Dover in helping convince the German high command that the main Allied effort was going there rather than to Normandy was probably of substantial strategic value in delaying the movement of German reserves into Normandy. It did not, however, affect the German forces already in the vicinity of the American airborne objectives.

It is very doubtful whether the simulated mission near Coutances designed to divert the enemy from the true American drop area had much effect. During the night, reports were received of landings in that area, but the Germans apparently reserved judgment on them pending reports of actual fighting. Postwar German assertions that their signal intelligence distinguished the true drops from the false by the presence or absence of radio activity seem questionable because for various reasons there was scarcely any radio activity that night in the genuine drop areas.

Seventh Army, which commanded the German forces in Normandy, had a rough idea of the situation by 0220, an hour and half after the main American drops began. Before 0300 it had identified the Caen area and the eastern Cotentin as areas of concentration. By 0340 its chief of staff was convinced that a major operation involving those sectors was in progress, and by 0500 he had recognized that Ste Mère Eglise was the focal point in the American drop area and had guessed that the Allies meant to cut the narrow base of the Cotentin.

What prevented Seventh Army for several hours from identifying the precise objectives of the American airborne missions was the accidental dispersion of the troops, who, as will be seen, had been spread over a 20-mile strip of the eastern Cotentin between Carentan and Valognes with some elements even more scattered. In the darkness even units in contact with them could only guess at their strength and distribution. Such information as was obtained filtered in slowly to

German higher headquarters, since paratroops were cutting wires and blocking roads at scores of places, and the French resistance forces were doing likewise all over Normandy. An extraordinary demonstration of the blindfold thus imposed on the Germans is the fact that as late as 1720 on D-day Seventh Army headquarters was still ignorant of the amphibious landings on UTAH Beach, which had begun 13 hours before, and supposed that in the Cotentin it had only airborne troops to deal with.<sup>77</sup>

In summary, aside from the diversion of German night fighters, Allied efforts at deception had at most a slight effect on German opposition to

the American airborne missions and, despite all attempts at secrecy, the Germans had some inkling of the impending invasion before midnight on D minus 1. However, it was too little, and too late for them to redeploy or even to issue a general alert before fighting began. They learned the general location of the assaults very quickly after that, but communication difficulties and the accidental dispersion of the paratroops prevented Seventh Army for four hours from making a precise estimate of their positions and objectives. Indeed, all through D-day German headquarters outside the invasion area had very little idea of what was going on inside it.



# OPERATIONAL CHAIN OF COMMAND FOR AIRBORNE OPERATIONS, ALLIED EXPEDITIONARY FORCE

5 JUNE 1944

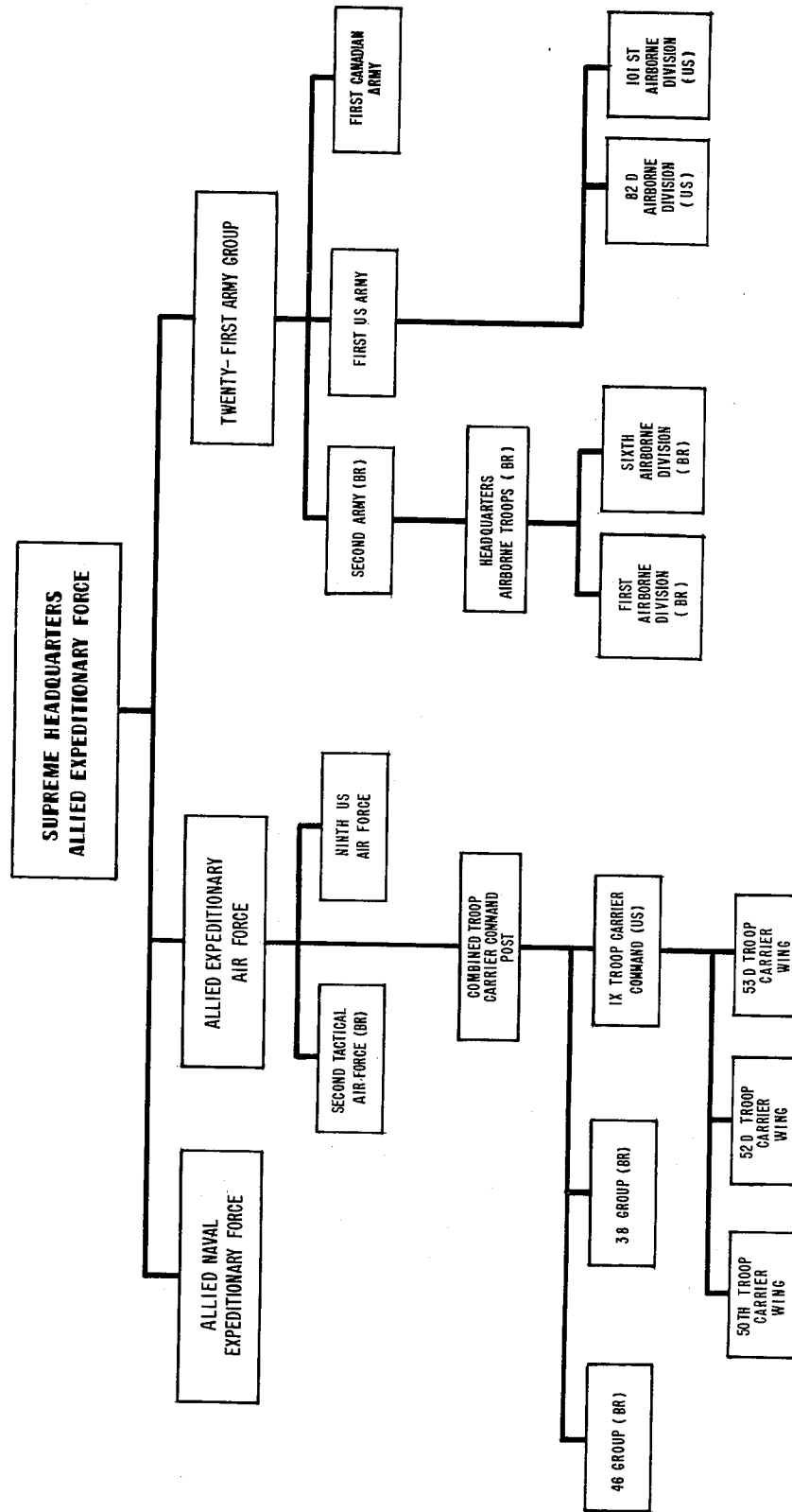


Chart 1

## The Assault\*

### The Pathfinders

THE PATHFINDER force which was to blaze a way for the airborne missions of IX Troop Carrier Command consisted of 6 three-plane serials, one for each of the 6 drop zones, and another serial of 2 aircraft added in accordance with a late decision. The troops carried by this serial were to jump on Drop Zone C, move about a quarter-mile west and set up aids for the 101st Division's first glider mission. Each plane carried panels, holophane lights, two Eureka beacons, and a team of pathfinder troops averaging 13 in number. In addition the pathfinders brought the two BUPS beacons.

The pathfinder drops in the 101st Division area were to begin at 0020 and those for the 82d Division at 0121, Double British Summer Time, which was the time used throughout the operation. Mass drops by the respective divisions were to begin half an hour after their first pathfinders landed. It was estimated that at least one team from each serial would be in operation on its zone in time to guide them.

The first pathfinder serial for the 101st Division took off from North Witham shortly before 2200 with Colonel Crouch flying the lead plane. It crossed Portland Bill slightly ahead of scheduled time of 2324. Twilight still glimmered in the western sky as the planes crossed the English coast.

The expert pathfinder pilots and navigators had no trouble reaching Normandy. They crossed the Channel in good formation "on the deck," risking collision with Allied shipping, in order to conceal themselves from German warning radar. A favor-

ing wind brought them to HOBOKEN about five minutes ahead of schedule. After turning there, they relied on the outline of the coast and islands displayed on the scope of the SCR-717 to guide them safely between the antiaircraft guns of Alderney and Guernsey and to show them the proper points at which to make landfall. In this they were successful, although radar maps prepared to help them interpret the SCR-717 had not arrived in time to be used. After reaching Normandy the fliers relied on Gee and dead reckoning, supplemented to the limited extent feasible by SCR-717 and visual recognition of the terrain.

The pathfinders for the 101st Division had been given a special course in order to facilitate their use of Gee. After passing Jersey they were to swing south of the main route, make a 90 degree turn to the left five miles offshore and fly east-northeast to points 2 or 3 miles south of Montebourg. There they would strike the Gee Chart lattice lines which passed through their respective drop zones, and make a 90 degree turn to the right to run down the lines to the zones.

On approaching the Continent the pathfinders found their navigation impeded by a layer of clouds which extended from the western shores of the Cotentin almost to the drop area. Sporadic German fire, mostly from small arms, damaged eight planes slightly but had no serious effect. Planners had feared that the Germans might jam the Gee sets, but interference was negligible.\*

The lead serial navigated by Gee from landfall to destination, although it did get a visual check at the final turn. At 0016 the jump signal was given. The troops came down about a mile northeast of

\*For route and assault area orientation in this chapter refer respectively to Map No. 1, p. 13, and Map No. 2, p. 34, and Map No. 3, p. 37.

\*To prevent jamming, new bands had been chosen at the last moment and each Gee set was put on a different frequency.



the objective, Drop Zone A, northernmost zone of the 101st Division. Unable to reach DZ A in time, they set up their navigational aids near the village of St. Germain-de-Varreville.

In the first serial for DZ C, the 101st Division's center drop zone, one plane was ditched with engine trouble before reaching Normandy. All aboard were rescued, the first of many to be picked up that day. The other two aircraft in the serial made their drop at 0025, having depended on Gee entirely except for some visual checks at the turn and a glimpse of Ste Mère Eglise by one crew. One stick of troops hit close to the zone and the other about half a mile southeast of it. The pathfinder equipment was put up on the zone, but about a quarter-mile southeast of its planned position.

The second serial to DZ C overshot the final turn but dropped its troops at 0027 between one and two miles south of the zone. However, the equipment brought by that serial was not to be used until dawn—for the glider missions—so the pathfinder troops had plenty of time to move into position.

The serial which was headed for DZ D, the third and southernmost of the 101st Division zones, misjudged its position because the Gee in the lead aircraft had not been properly set, failed to recognize its final turning point, and ran out over the east coast before discovering its mistake. It made a sweeping circle to the right and approached the DZ from the southeast over the Carentan estuary. The drop, believed to be accurate, was made at 0045; the troops actually landed about a mile from the zone.

The three pathfinder serials scheduled for the drop zones of the 82d Division were to go straight from PEORIA to their zones, just as the main paratroop serials of the division were to do. This course cut diagonally across the lattice lines of the Gee charts, a satisfactory if not ideal arrangement. An approach down the lattice lines was not feasible for them, since it would have required passing close to German anti-aircraft concentrations.

The pathfinder serial bound for DZ O, the zone outside Ste Mère Eglise, attempted to cross the Cotentin on Gee but swerved north, passed close to Valognes and made its final run parallel to the lattice lines. It was fired on but surprise and the cloudy weather saved it from serious damage. At 1115, six minutes ahead of schedule, it dropped its

teams on the basis of Gee indications supplemented by a visual check. All troops landed on or close to the zone.

Of the two DZ's on the west side of the Merderet, the northernmost was called DZ T, the southern one DZ N. The three planes bound for DZ N made their approach according to plan at 0138 and had a good look at the DZ area. Their navigators were sure the drop had been accurate, but the troops landed over a mile southeast of the zone.

The pathfinder serial for DZ T made landfall appreciably north of PEORIA, but made accurate use of Gee, sighted some landmarks near the zone, and dropped its team with precision. Unlike the other serials it had come in considerably above the prescribed altitude of 600 feet.

The fact that most of the pathfinder pilots who supposed they had pinpointed their DZ's with Gee had actually missed them by over a mile was attributed by an AEAFF radar expert to the navigators' relatively limited experience with Gee and to the combat conditions under which they worked. He thought the normal margin of error in such cases would be about three times as great as under favorable conditions. However, other factors besides Gee should be considered. Difficulty in allowing for the brisk northwest wind probably contributed to the deflection of some teams, and slight delays in jumping might account for an apparent tendency to overshoot.

At any rate, though only two serials achieved the degree of accuracy prescribed in the directives, all teams were put near enough their zones to perform their missions in spite of cloudy weather which might easily have caused the pilots to lose their way completely had they not had Gee to help them.<sup>1</sup>

### **ALBANY Mission and The Paratroop Operations of The 101st Division**

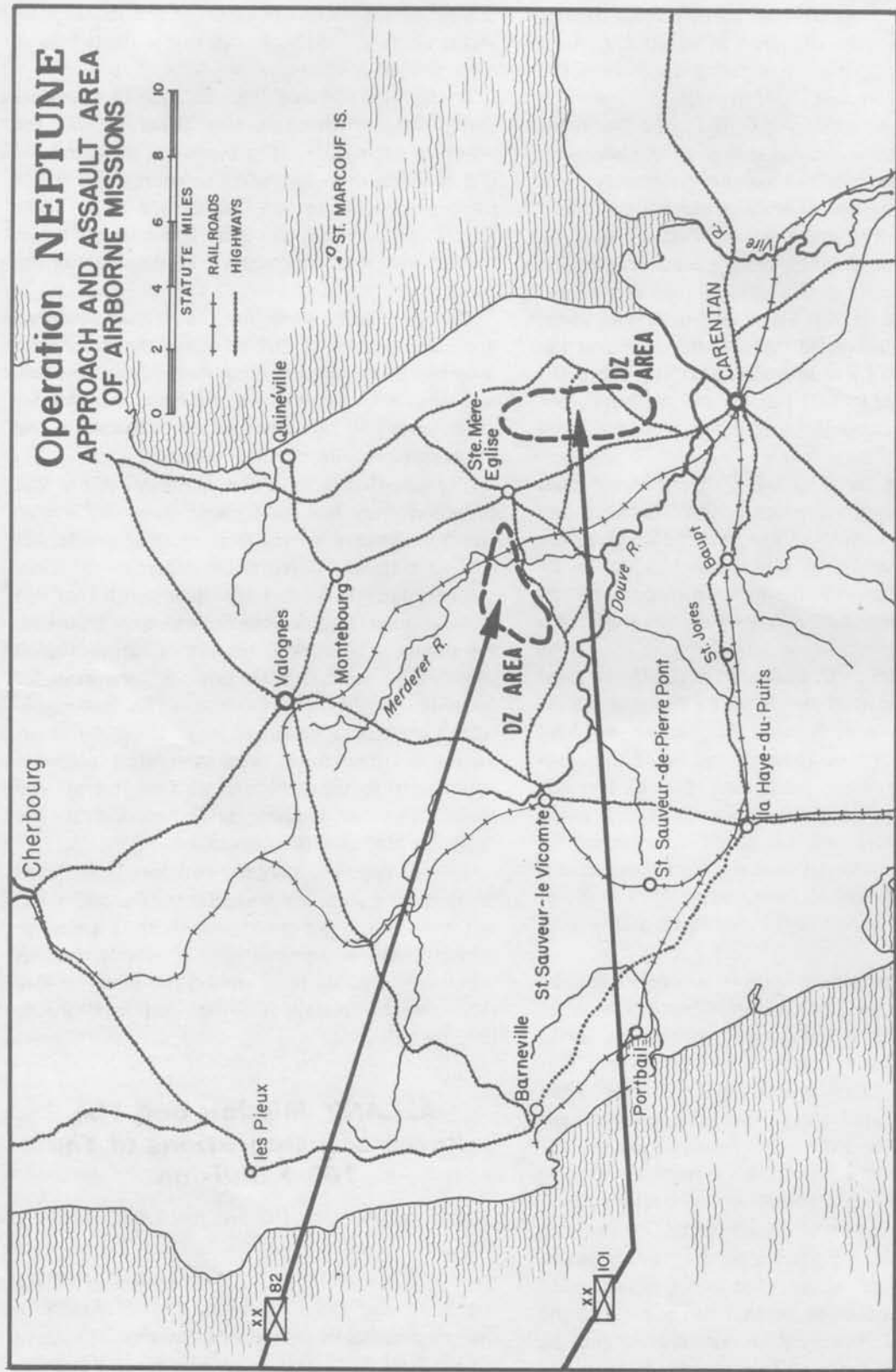
Half an hour after the first pathfinders jumped, the main paratroop drops began. These were ALBANY, a mission by 432 aircraft carrying troops of the 101st Division, and BOSTON, a 369-plane mission for the 82d Division. The missions were divided into serials, most of which contained 36 or 45 planes. In 1943 it would have

# Operation NEPTUNE

## APPROACH AND ASSAULT AREA OF AIRBORNE MISSIONS



RAILROADS  
HIGHWAYS



Map 2.

been all a group could do to contribute one such serial. Having been raised to almost double the 1943 strength, all IX TCC's groups except the 315th, the 442d, and the two groups responsible for the morning glider missions, were able to send two serials.

Within the missions the interval between successive serials was to be six minutes from head to head. With two minor exceptions, each was made up entirely of nine-aircraft V's of V's in trail, with the leader of each nine-ship flight keeping 1,000 feet behind the rear of the preceding flight. The leaders of the wing elements in each flight were to fly 200 feet behind and 200 feet to the right and left respectively of the rear planes in the lead element. Within each three-plane element the wingmen were to hold positions 100 feet back and 100 feet to the left and right of their leader. This was a tight formation at night for aircraft approximately 65 feet long and 95 feet from wing-tip to wingtip.

A preliminary warning would be given to the paratroops when their plane was 20 minutes from its zone, and the door cover would then be removed. When four minutes from the DZ the lead pilot of each serial was to flash a red warning light by the door to alert the troops. They would then line up for the jump and would hitch their parachutes to the static line. An order to flash the red light would be transmitted to the rest of the serial with a red Aldis lamp displayed by the radio operator from the astrodome and would be passed on by the other flight leaders to the pilots behind them. Approaching the zone the formations would descend to 700 feet and slow down from the cruising speed of 140 miles an hour prescribed for the outward route to 110 miles an hour to give the paratroops the best possible drop. When in position over the drop zone the serial leader would give the green light which was the signal for an immediate jump. The signal would be passed back as before by a green Aldis lamp, with the flight leaders repeating the signal when they found themselves at their jump point. Before the men jumped the crew chief and the paratroops nearest the door were to shove out bundles of supplies and equipment.\* References in unit histories indicate that these procedures were generally followed.

All pilots were adjured to drop all their troops. Evasive action prior to dropping was prohibited

lest it disrupt formations or throw the paratroops into confusion. Planes missing a drop zone on the first pass were to drop near it if possible. If they overshot so far as to find themselves over the east coast, they were to circle to the right and drop their loads on DZ D. Stragglers would be held responsible for finding their own way to their zones, using Rebecca if necessary.

After completing the drop, the pilots were to dive down onto the deck and fly out over the coast to the St. Marcouf Islands at an altitude of 100 feet as a precaution against antiaircraft and other ground fire in the coastal area. They would proceed home at a cruising speed of 150 miles an hour by way of GALLUP, and Portland Bill, climbing to 3,000 feet at GALLUP in accordance with agreements with the naval commander. Over England they would retrace the routes taken on the way out, except that the 50th Wing was authorized to take a 20-mile short cut from the coast to its wing assembly point.<sup>2</sup>

The loading, take-off and assembly of the troop carrier serials in ALBANY was accomplished as the 101st Division later reported with "notable efficiency."<sup>3</sup> This was the well-earned result of the many months spent in planning, training and preparation of equipment.

It is true that both troops and planes were loaded to the limit. Some paratroops when fully laden weighed as much as 325 pounds and had to be boosted aboard their planes much as 14th century knights were hoisted onto their horses. Partly as a result of this individual overloading, some planes contained more than the 5,850 pounds prescribed in the field orders as the maximum. Also, several carried more than 18 paratroops, although this was considered the maximum for a good drop from a C-47. These overloads, generally slight, did not hinder the flight of the planes but may have created some delay and confusion in the drops.

Take-off went rapidly and smoothly despite the ban on use of radios. Blinker lights were used to control taxiing and take-offs. Not one plane had an accident, and none had to turn back. At Greenham Common the 438th Group, which was to fly the lead serials, got 81 planes in the air between 2232 and 2256, an average of 18 seconds per plane. The 441st at Merryfield reported that its aircraft took off at average intervals of 10 seconds apiece. Other groups made similar time. Such

\*The usual number of bundles was two.

speed was made possible by high proficiency and the excellence of the British airfields.

Assembly, never an easy matter at night, was handled with equal success. All serials spiraled into formation over their home fields and swung onto course over ELKO at approximately the prescribed six-minute intervals.<sup>4</sup>

The weather over England was then in process of changing and varied from hour to hour, and from base to base. The wind ranged from 10 to 30 miles per hour from the north and west. Cloudiness ran the gamut from none to 10/10, the overcast, fortunately, being above 4,000 feet. However, over the Channel the sky was generally clear and visibility excellent. As one pilot put it "It was a beautiful night. You could fly formation by moonlight."<sup>5</sup>

Under these conditions navigation was easy as far as HOBOKEN. Apparently all the serials in ALBANY approached Normandy on course and in good formation. Almost all were four or five minutes ahead of schedule, probably because of the wind, but the condition was so general that they kept their relative positions and did not over-run each other.

The coastline at the IP was visible, but immediately beyond it the mission ran into an unforeseen obstacle which disrupted its formations and very nearly caused it to fail. This was the cloudbank already encountered by the pathfinders. It extended solidly for 10 or 12 miles inland, becoming progressively thinner and more broken between the center of the peninsula and the east coast. Near the IP the base of this layer was at an altitude of 1,100 feet and its top at about 2,000 feet. With any sort of warning the troop carriers could have flown over or under it, but no provision for such a warning had been made, and radio silence was in effect. Thus the pilots, flying at 1,500 feet as prescribed, did not know of the overcast until it loomed up close ahead, and most of the formations plunged into the heart of it.

The first four ALBANY serials, two from the 438th Group at Greenham Common and two from the 436th Group at Membury, consisted of 36, 45, 36, and 54 aircraft respectively. They had been given the task of bringing the 502d Parachute Infantry Regiment and the 377th Parachute Field Artillery Battalion to DZ A. The lead plane of the first serial was flown by Lt. Col. John M. Donalson, commander of the 438th. DZ A was a rough

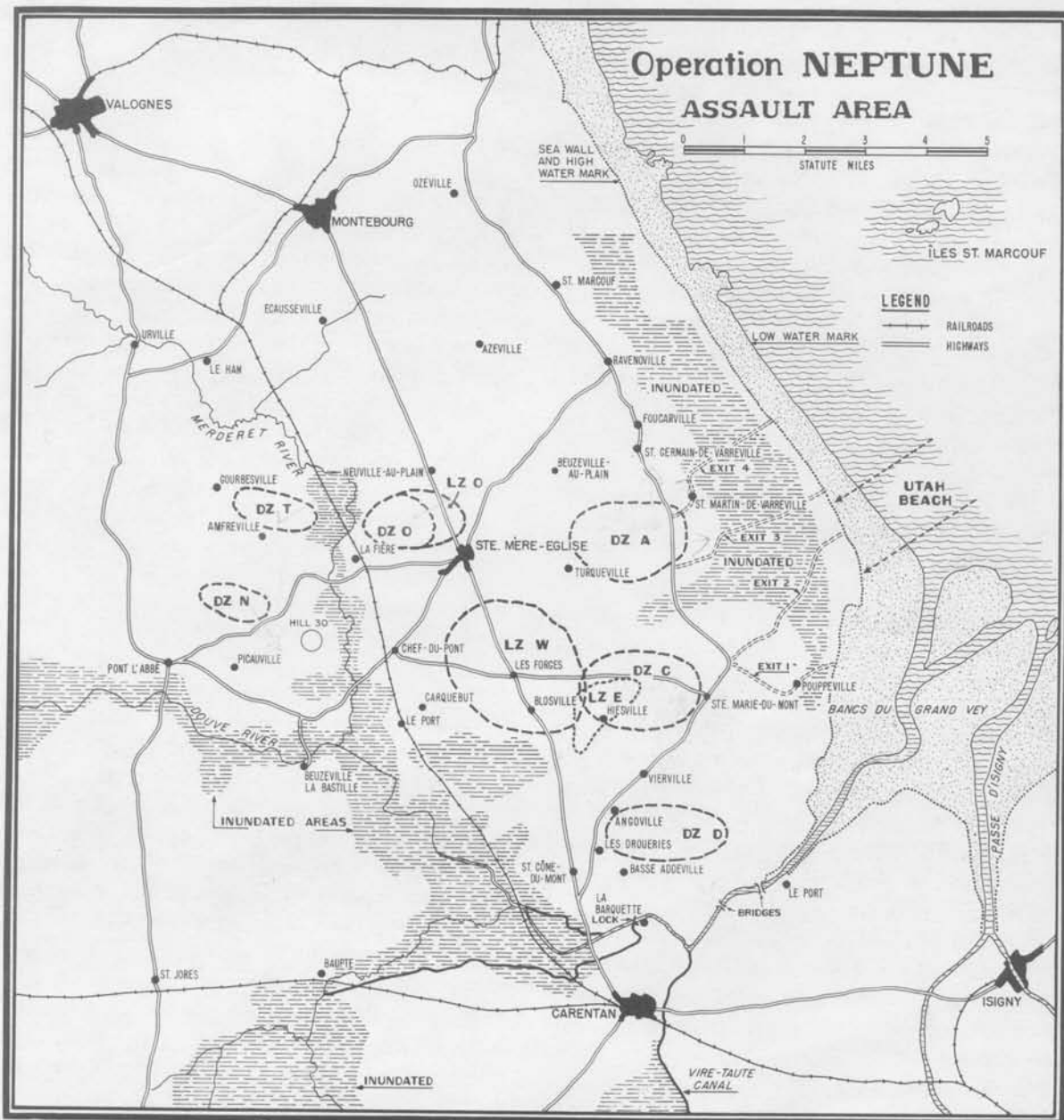
oval about a mile and a half long from west to east and about a mile wide, situated 2½ miles east of Ste Mère Eglise and half a mile southwest of St. Martin-de-Varreville. Only a mile east of the zone were the flooded areas behind UTAH Beach, a hazard to troops who were slow to jump or whose pilot overshot. Like all zones of the 101st, DZ A was on low, flat land broken into small fields and orchards.

These four lead serials had the easiest approach of any. They reported light, scattered clouds over Normandy but apparently had little trouble keeping clear of them. They had greater difficulty with a ground fog which limited visibility in the drop area to about three miles. Moreover, they achieved a degree of surprise which gave them substantial protection from the enemy. The lead flight reached the drop area without being under fire; the second was near Ste Mère Eglise when first shot at; and all the rest of the 438th was several miles inland before the enemy went into action. The serials of the 436th came under fire soon after landfall, but it was inaccurate, sporadic and mostly from small arms. So feeble was the opposition that the two groups lost no aircraft, suffered no serious damage, and had no casualties. In the 438th Group five or six planes received slight damage, mostly bullet holes, and 11 in the 436th had similar petty damage.

The pathfinder troops allotted to DZ A had been unable to get their beacons in operation in time for the arrival of the first serial of the 438th Group, so Colonel Donalson made his approach and drop on Gee. His passengers jumped at 0048,\* two minutes ahead of time, from the prescribed altitude. By 0058 the Group had completed its drop, although several planes had had to circle back for a second pass. Of 1,430 troops carried in the first two serials all jumped but one man who had been stunned by a fall.

About the time the second serial of the 438th reached the drop area, the pathfinders got a Eureka beacon and an amber T into operation near St. Germain-de-Varreville, a mile north of the zone. The 436th Group obtained responses from the Eureka at a point 10 miles away, probably at the moment the set was switched on. Some pilots also sighted the amber T. Several pilots had to make extra passes, and one made three to get all

\*So states the operations report. The group history gives the time as 0044.



Map 3.

his troops out; a bundle had stuck in the door on his first run. The 436th had carried 1,084 men and 12 guns and dropped all but two or three injured men and one who refused to jump.

Both groups reported their drops as ranging from good to excellent, and unit histories, written some three weeks later, reiterate assertions that the drops were both accurate and compact.<sup>6</sup> Actually, none of the four serials had done very well, and one had done very badly.\* Colonel Donalson's lead serial had dropped the 2d Battalion of the 502d PIR compactly but inaccurately. Through some maladjustment or misinterpretation of his Gee set, Donalson gave his troops the green light on the far edge of DZ C, three miles south of DZ A, and 26 of his pilots in tight formation followed his example. Six others dropped within a mile of this concentration. One straggler in the serial put his load within a mile of DZ A; one dropped five miles northwest of that zone; and one stick was missing.†

The second serial of the 438th was more accurate than its predecessor, but seems to have flown a rather loose formation. Its leader dropped his troops, members of the 3d Battalion of the 502d, near the south side of DZ A, but none of his flight dropped with him. He may have relied on Gee, while the others homed on the Eureka near St. Germain. At any rate, 36 of the pilots put their sticks in an area about four miles long from west to east and about two miles wide, with the pathfinder aids at its center. Three others, including the leader, dropped within two miles of the zone; five impatient pilots dumped their men three or four miles short of the DZ, and one stick went unaccounted for.

The lead serial of the 436th Group, which carried the 1st Battalion of the 502d PIR, placed 20 of its 36 loads, including those of the leader and his two wingmen, within about a mile of the beacons. These can be considered as dropped from a loose formation onto what appeared to be the

drop zone. Of the rest, 4 were within a mile of the original zone and 6 between one and 2 miles from it. Presumably their pilots had straggled slightly and had used landmarks or dead reckoning to pick their drop points. Another 4 sticks landed between 2 and 4 miles from DZ A; one load fell in the Channel; and one was listed as missing.

In contrast to this respectable performance was that of the second serial of the 436th, which was supposed to deliver the 377th Parachute Field Artillery and 12 of its guns, a planeload of medics, and 5 planes of supplies. All the flights in this formation missed the DZ by a wide margin, and all but the first 2 flights had become badly dispersed before they made their drops. Those 2 flights followed a line of approach which passed about 3 miles north of the DZ. The first did drop its troops about 3 miles away near St. Marcouf, a village near the coastal marshes which might have been mistaken for St. Martin-de-Varreville. The second flight dropped prematurely from 5 to 7 miles northwest of the zone. The last four flights in the serial got thoroughly lost and badly dispersed. How they did so, and why hardly any of them recognized and corrected their errors is anybody's guess. Most made a pronounced deviation to the north, with the result that 5 sticks were dropped beyond Valognes at points between 10 and 20 miles northwest of the zone; and 21 loads came down between 5 and 10 miles north of it; and 2 sticks went unaccounted for. Of the 8 sticks which landed within a 5-mile radius of the zone, only one was within a mile of it and one other within 2 miles. If the 2 pilots delivering them knew approximately where they were, they were the only ones in the serial who did.<sup>7</sup>

The mission of the units dropped on DZ A was to seize the exits of Causeways 3 and 4 which were a little more than a mile away to the southeast and northeast respectively. In addition the paratroops were to clean up German positions near St. Martin-de-Varreville and to establish a defense on the north flank of the 101st Division on a line running from the marshes near St. Germain-de-Varreville to a contact-point with the 82d Division near Beuzeville-au-Plain.

The 2d Battalion of the 502d Parachute Infantry Regiment, despite its excellent concentration, had such trouble in assembling and orienting itself in its unexpected location that it played little part

\*Discussions of drop accuracy in NEPTUNE must be regarded as approximations. General Taylor and his staff, though dropped comparatively close to their zone, did not know where they were until dawn, and this apparently was true of a majority of the paratroops. Since they moved about constantly in zig-zags during the night attempting to assemble, to gather equipment, to engage or avoid the enemy and to reach their objectives, they might at dawn be several miles from where they had come down and with only a vague idea of the direction and extent of their wanderings.

†Sticks described as missing were so listed in reports a month or more after D-day. In most cases that means that no member of the stick had returned to duty at that time.

in the action on D-day. This difficulty was in part caused by the dense hedges which split most of that part of Normandy into a maze of little fields known as the bocage.

The 3d Battalion, scattered as it was, achieved its objectives. It was scheduled to help the 2d Battalion if necessary in neutralizing a coastal battery west of St. Martin-de-Varreville, but its principal task was to capture the causeway exits. Lt. Col. Robert G. Cole, the battalion commander, hit the ground about half a mile west of the drop zone, made a false start toward Ste Mère Eglise, discovered where he was, and headed eastward across the zone toward his objectives. On the way he picked up about 75 men including some from the 82d Division and several others who did not belong to his battalion. They reconnoitered the coastal battery about 0400 and found that it had been dismantled and abandoned as a result of damage recently inflicted by the RAF. Already at the battery were the commander of the 2d Battalion and a dozen of his men waiting in vain for the rest of their unit. With the battery disposed of, Cole decided to attack the causeways. He divided his men into groups, one to take Exit 4,\* another Exit 3, and another to go to DZ C and make contact with the 506th PIR. Exit 4 was found unoccupied but unusable, because German guns to the northwest could rake the causeway. Cole led the assault on Exit 3 and took it easily before 0730. When, about two hours later, German forces driven from the beaches began retreating across that causeway, they were easy game for the entrenched paratroops, who killed over 50 of them without losing a man. At 1300 the first American patrol from the beaches arrived at the exit. Following the patrol came the 1st Battalion, 8th Infantry Regiment, which moved inland from the causeway and bivouacked that night about two miles east of it. At the end of the day Cole's battalion, then numbering about 250 men, was ordered into regimental reserve. It had accomplished its mission.

The 1st Battalion of the 502d, which was supposed first to destroy the German troops quartered on the outskirts of St. Martin-de-Varreville and then to establish a defensive line on the northern flank of the division, achieved even more spectacular results than the 3d, and with even fewer men. Its commander, Lt. Col. Patrick J. Cassidy,

landed near the pathfinder beacons outside St. Germain,\* collected a small force, composed mostly of his own men, and marched on St. Martin. By 0630 he had reached there and set up a command post. Keeping part of C Company in reserve, he first checked the situation at Exits 3 and 4, then sent about 15 men to attack the German quarters. With a few later additions this handful of men with tommy guns, bazookas and grenades took the massive stone buildings in which the Germans had barricaded themselves. Before they finished the job at 1530 they had killed or captured over 150 of the enemy.

Meanwhile some 45 men of A Company had undertaken the task of defending the division's northern perimeter. During the morning they seized the village of Foucarville and by early afternoon had established four roadblocks in that area. The Germans around Foucarville greatly outnumbered them, but contented themselves with unaggressive patrolling. Late in the afternoon the arrival of 200 more paratroops at Cassidy's CP enabled him to move reinforcements onto the northern flank. He thereupon sent his reserve, C Company, to occupy the Beuzeville sector of the perimeter, two miles inland from Foucarville. The company encountered such stiff resistance that Cassidy hastily dispatched B Company, which had assembled during the afternoon, to move into line on C's left flank. As yet there was no contact with the 82d Division and the thinly held perimeter seemed for a time to be in danger. However, the low quality and morale of the enemy and the advance of Allied forces from UTAH Beach saved the day.

The German forces facing A Company lost their nerve and shortly before midnight at least 137 of them hoisted the white flag. About the same time two battalions of the 22d Infantry Regiment, which, unable to cross on Causeway 4, had spent seven hours wading through the marshes, were plodding into St. Germain-de-Varreville, and the 12th Infantry Regiment, which had also waded the marshes, was moving into position in the Beuzeville sector ready to take the offensive next day. Thus the independent operations of the 502d were successfully concluded within 24 hours after its jump.

\*One statement that he landed "in the middle of the battalion drop zone near St. Germain-de-Varreville" is self-contradictory. (UTAH Beach to Cherbourg, (Washington, 1948) p. 18.)

\*See Map No. 3, p. 37.

As for the 377th Field Artillery Battalion, only a handful of its men played a significant part in the fighting on D-day, and only one of its 12 guns supported the operations of the 101st Division. Scattered many miles north and west of the drop area, the artillerymen engaged the enemy in innumerable little fights and showed great resourcefulness in regaining the Allied lines, but their actions had at best a nuisance value.<sup>8</sup>

The next three serials in ALBANY were 45 aircraft of the 439th Group from Upottery carrying the headquarters and 1st Battalion of the 506th Parachute Infantry Regiment, 36 from the group carrying the 2d Battalion of the 506th, and 45 planes of the 435th Group from Welford with the 3d Battalion of the 501st PIR plus divisional headquarters and artillery and signal personnel. The lead plane of the 439th was flown by the group commander, Lt. Col. Charles H. Young, and had on board Col. Robert L. Sink, commander of the 506th PIR. In the lead aircraft of the 435th Group, which was flown by the group commander, Col. Frank J. MacNees, were General Taylor and several of his staff, and the second plane of that group carried the 101st Division's artillery commander, Brig. Gen. Anthony C. McAuliffe.

The destination of these serials was DZ C, an oval 1½ miles long from west to east and over a mile wide. It was 2½ miles south of DZ A and a mile east of the highway from Carentan to Ste Mère Eglise. Through it went a road running east from the hamlet of les Forges on the highway to the village of Ste Marie-du-Mont. A large flooded area just southwest of les Forges provided a landmark to guide the troop carriers' approach.

The formations of the 439th and 435th reached Normandy in good shape, only to run squarely and unexpectedly into the cloudbank which covered the western Cotentin. Colonel Young climbed through the overcast on instruments, descended through a hole in the clouds 11 miles inland, and headed for the drop zone using Gee and Rebecca. The pathfinders responsible for DZ C had managed to get a Eureka beacon in operation a few moments earlier. However, loss of lights and the presence of enemy troops had prevented them from setting up a T. All they could do was to flash a single green Aldis lamp. Young apparently did not see this, but he did recognize the principal landmarks around the DZ and dropped accurately

at a bend in the road to Ste Marie-du-Mont on the northeast side of the zone at or slightly before his scheduled time of 0114.

All but a few of Colonel Young's serial had lost contact with him in the clouds and their formation had loosened and broken. The other two serials disintegrated. This was natural, since in the overcast pilots generally lost sight of the dimmed lights of planes in other flights and were often unable to see even the planes in their own element. In addition, they had reacted to the situation in different ways, some going stubbornly ahead, others climbing to get above the clouds or diving to get under them.

On emerging from the overcast they were harassed by light flak and small arms fire which was moderately severe over the last eight miles of the route. Its effect was intensified by the fact that many stragglers passed over danger spots such as Pont l'Abbé (Etienville) a mile or two off the proper course. Three planes in the 439th Group were shot down and crashed with their crews. The pilot of one of them, Lt. Marvin F. Muir, saved his paratroops at the cost of his own life by holding his burning craft steady while they jumped. The group had a total of 27 aircraft damaged, but only 3 severely enough to need the attentions of a service unit later. Three planes in the serial from the 435th Group blew up or went down in flames before reaching the drop zone; the only survivors were a few troops who were lining up at the door of one plane when it was hit. Seven other planes in the group were hit, but not seriously damaged.

In spite of its difficulties, Colonel Young's serial managed to give its troops a fairly good drop. Only two or three serials in NEPTUNE did better. Besides Young himself 14 pilots put their loads on or almost on DZ C. Another 13 bunched their sticks within a mile and a half east and southeast of the zone. The rest straggled. Six dropped troops from three to five miles north of DZ C; another dropped seven miles north, and four did so about five miles south on the far side of the Douve river. Very much on the debit side were a pilot who ended up 17 miles to the north and a three-plane element which dropped its unfortunate troops 21 miles to the northwest.

The second serial of the 439th, besides becoming rather dispersed, had swung three or four



degrees to the north onto a line of flight which brought it over Ste Mère Eglise. The paratroops, seeing beneath them green T's, which had been set up for the 82d Division on DZ O, clamored that they were being taken past their zone. The pilots in the front of the serial knew this was not the case and flew straight on, headed perhaps for the Eureka outside St. Germain-de-Varreville. A dozen dropped troops in a loose pattern in the general vicinity of St. Germain, and another five placed their sticks slightly south of there near DZ A. In the rear of the serial, 14 well-bunched planes made their drop prematurely close to Ste Mère Eglise. Either their pilots had mistaken DZ O for DZ C or they had yielded to the demands of the paratroops for an immediate drop. One plane in the serial put its stick within a mile of DZ C and 2 others came within 2 miles of it. Only one stick, 6 miles to the north, was outside a five-mile radius of the zone. One was missing.

The 435th Group made its first drops about 0120, six minutes ahead of schedule. Its serial had scattered so widely that at least 25 stragglers felt justified in using Rebecca. This action was probably decisive in enabling most of them to make a good drop. The Eureka signals came through strong and only slightly cluttered despite the heavy use. With their aid about 20 pilots came close enough to the pathfinders to see their green light blinking. However, several overshot the zone and had to circle for a second try.

None of the group hit DZ C, but 25 dropped troops or supplies within 1½ miles of it. Of these, 16 bunched their loads close to the east end of the zone near the pathfinder aids. All but one of that bunch were from the first 21 planes in the serial, and among them were the first two sticks with Generals Taylor and McAuliffe. Another six sticks came down between 1½ and 3 miles from the DZ. For some strange reason eight pilots of various flights concentrated their loads near St. Jores about eight miles southwest of DZ C on the south side of the Douve. Since it is unlikely that they would make the same gross mistake independently, the presumption is that these pilots had formed an improvised flight after emerging from the overcast and made their erroneous approach in formation behind a pilot who either did not use radar or could not use it properly. Three other loads were dropped between 5 and 10 miles

from the zone, and one bewildered pilot of the 435th returned to base with his troops.\*

In all, the 439th Group had carried 1,357 troops to Normandy and dropped all but about 33—those whose planes were shot down, one wounded man, and one who refused to jump. The 435th had carried 677 and dropped 626. Of the others, 36 were shot down, 13 were with the pilot who lost his way, and 2 had equipment trouble.<sup>9</sup>

The paratroops on DZ C had been assigned to take the exits of the two southern causeways and to clear the Germans from the vicinity. Exit 1† was near the hamlet of Pouppeville, two miles east of the DZ, and Exit 2 was two miles northeast of the zone. Unable to assemble more than a fraction of their men, the paratroop commanders found it difficult to reach their objectives in the face of opposition.

The taking of the exits had been entrusted to the 2d Battalion of the 506th PIR, but few of its men landed near the drop zone, its main concentrations being near Ste Mère Eglise and St. Germain-de-Varreville. By 0330 almost 200 of its troops and 20 from the 82d Division had assembled near St. Germain under the battalion commander. They set out about 0430 for the causeways, but machine gun nests and interdictory artillery fire so slowed their progress that not until 1330 did a few men work their way around the German strongpoints to Exit 2. They found it already in American hands and crowded with troops, tanks and guns. The 8th Infantry Regiment had made its way across from UTAH beach before noon and secured the exit. The paratroops enlisted the aid of some of the soldiers and tanks at the exit to mop up the German strongpoints blocking the progress of the main body of the 2d Battalion. This was quickly done, and by 1530 the battalion was in position at Exit 2 with about 300 men at its disposal.

Despite the relatively good drop given by Colonel Young's serial to Regimental Headquarters and the 1st Battalion of the 506th, they were unable to assemble quickly. One reason for this was lack of communications. Most of the signal equipment and all the operators had come down many miles outside the drop area. Two hours after the drop only about 45 men from head-

\*He tried again next night with the 435th's glider serial and made a successful drop.

†See Map No. 3, p. 37.

quarters and 50 from the 1st Battalion had gathered under Colonel Sink at Culoville on the south side of the zone. These troops had been designated as regimental reserve, but at dawn Sink, having heard nothing from the other battalions, sent what he had of the 1st Battalion to take Exit 1. Delayed by a series of skirmishes, they were unable to reach the exit until mid-afternoon. They found the 3d Battalion of the 501st PIR already in possession.

About 90 men of that battalion under their commander, Lt. Col. Julian Ewell, and 60 members of divisional headquarters, including Generals Taylor and McAuliffe, had managed to assemble during the night. Though only a short distance southeast of the drop zone, none of them knew where they were until the rising sun revealed the church tower of Ste Marie-du-Mont looming above the trees. Soon after daybreak General Taylor ordered an attack on Exit 1 by the headquarters troops and Ewell's battalion, which had been intended for divisional reserve. Ignorant of how the rest of his division was faring and aware that American possession of the causeways was essential, Taylor was staking everything on a bid to take one.

At 0600 some 60 paratroops of the 501st under Ewell and 25 from divisional headquarters, including the two generals, set out for Pouppeville. The little force was top heavy with rank. Taylor remarked dryly that never were so few led by so many. Except for one brief encounter they advanced unopposed to Pouppeville, picking up about 60 more men along the way. About 0900 on the outskirts of Pouppeville they ran into stubborn resistance from Germans of the 1058th Grenadier Regiment, part of the 91st Division. The attackers lacked men and firepower for a real assault and had to squeeze the Nazis out in house-to-house fighting which lasted until noon. Casualties numbered 18 paratroops and 25 Germans, and 38 Germans were taken prisoner. A few minutes after the village was taken elements of the 8th Infantry Regiment crossed the causeway and established contact between airborne and seaborne forces.

Meanwhile the situation back at DZ C was difficult and dangerous. About 150 paratroops gathered during the morning at a divisional headquarters set up at Hiesville by a few men Taylor had left behind. At noon they were reinforced by over

100 troops who had landed at dawn in the CHICAGO glider mission. Colonel Sink's CP at Culoville was also reinforced by more than 70 additional men of the 1st Battalion of the 506th PIR who had found their way to the DZ. These, however, seemed all too few. The enemy were swarming around like hornets and twice pushed attacks close enough to threaten the Culoville position. Unknown to the Allies, the Germans had installed an entire battalion of the 191st Artillery Regiment in and around Ste Marie-du-Mont. Many paratroops who landed near their positions had been shot before they could get free of their chutes. The rest gave a good account of themselves and even took one of the German batteries, but it was not until after 1420 when elements of the 8th Infantry Regiment pushed into the town that the issue was decided and German resistance in Ste Marie was broken.

At the end of the afternoon the portions of the 1st and 2d Battalions of the 506th PIR which had been at the causeways returned to DZ C, giving Colonel Sink a total of some 650 men, including a few from other units. Their initial task had been accomplished, and the 2d and 3d Battalions of the 8th Infantry Regiment had moved into positions around les Forges thus shielding the 506th from the west. However, efforts to seal off and occupy the area between them and the Douve had not succeeded, and the situation there was so chaotic that General Taylor, returning from Pouppeville, ordered the 506th to make a reconnaissance in force into this no-man's land next morning.<sup>10</sup>

The last serials of ALBANY were two of 45 aircraft apiece, flown by the 441st Group from Merryfield, and one of like size by the 440th Group from Exeter. The first serial carried the 1st Battalion, part of the 2d Battalion, and Regimental Headquarters of the 501st Parachute Infantry Regiment. In its lead plane were Lt. Col. Theodore Kershaw, the group commander, and Col. Howard R. Johnson, the regimental commander. The second serial contained most of the 2d Battalion of the 501st, half an engineer company, and some medical personnel. The last serial carried the 3d Battalion of the 506th PIR and the rest of the engineer company. The destination of these serials was DZ D.

Ten days before the invasion this zone had been located about three quarters of a mile southwest of DZ C, and only the 3d Battalion, 506th

PIR, was scheduled to drop on it, the battalion's mission being to secure the southern perimeter of the 101st Division along the Douve. At that time the 501st PIR (less the 3d Battalion) was supposed to jump on DZ B, 1½ miles south of Ste Mère Eglise for the purpose of taking that town and the bridges over the Merderet at la Fièrre and Chef-du-Pont. On 27 May when those tasks were transferred to the 82d Division, the 501st was shifted to DZ D to help hold the Douve line.<sup>11</sup>

Since new objectives of the 501st were about 2½ miles south of DZ D, the zone was relocated about a mile further south at the request of the regimental commander. Its new position was between Angoville-au-Plain and Basse Addeville, a hamlet 1,200 yards east of St. Côme-du-Mont. Somewhat smaller than the other DZ's, it was less than 1¼ miles long from east to west and slightly under a mile across.

In making their final approach to the zone, the pilots would have four landmarks to guide them: the junction of the Douve and Merderet, 4½ miles from the zone; the railway, 2½ miles from the zone, the flooded area which lay east of the railroad north of the line of flight; and the north-south highway to Carentan, which they would cross less than a mile before reaching the DZ. A secondary road to Ste Marie-du-Mont skirted the west end of the zone.

The 441st and 440th Groups, like their predecessors, had little trouble reaching Normandy, but over the French coast the first serial of the 441st ran into the clouds and broke up. The two lead flights of the second serial ducked under the overcast and kept formation, but its other flights hit the cloud-bank and dispersed. The serial from the 440th appears to have avoided the clouds and held together.

Little fire was encountered over the western part of the Cotentin. The 441st reported considerable shooting near St. Sauveur de Pierre Pont and at other points between there and the DZ. The 440th had scant opposition until it was within six miles of the zone. Then it received intense light flak and automatic fire which caused many pilots to take evasive action and drop out of formation. Searchlights and magnesium flares further loosened the formations by dazzling pilots and forcing them to dodge. Some searchlights were quickly attacked and extinguished by Allied night-fighters but others survived long enough to cause trouble. Very in-

tense flak and automatic weapons fire was encountered on DZ D and immediately west and east of it.\* The Germans had spotted the area as a likely one for airborne use and were present in force. Fortunately their fire was not accurate, and the actual number of anti-aircraft guns was probably small. The rate of aircraft losses for the three serials was less than 5 percent. One plane of the 441st blew up before reaching the drop area, and another crashed soon after dropping its load. A third, hit by anti-aircraft fire as it left the DZ, made a forced landing near Cherbourg, its crew ultimately reaching the Allied lines in safety. One plane limped home good for nothing but salvage, and 14 others in the 441st were damaged.† In the 440th two planes were shot down by intense machine-gun fire over the DZ, and another, hit as it left the zone, plunged into the sea. A dozen other craft of the 440th suffered damage but were quickly repaired.

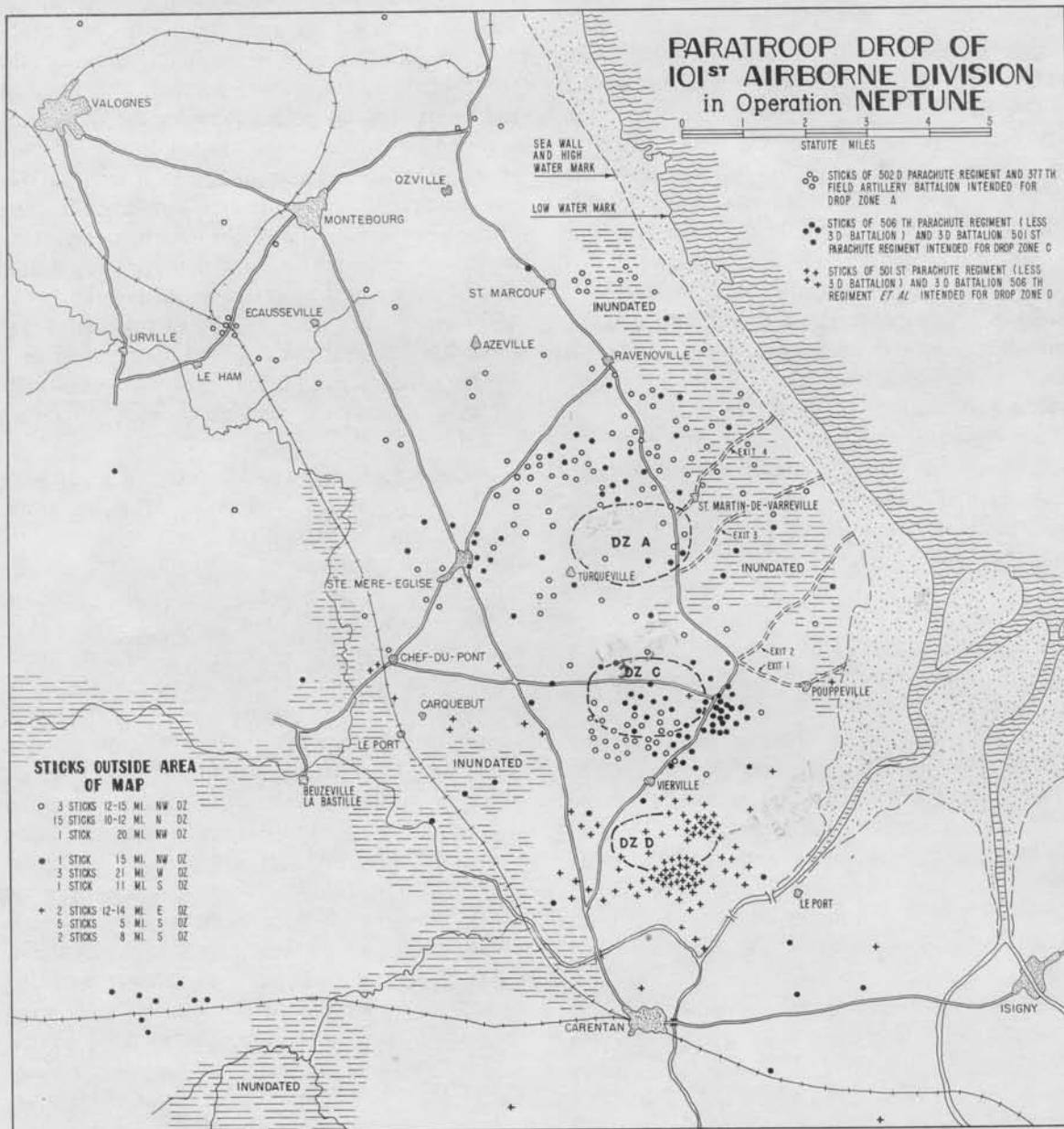
A Eureka which the pathfinders had set up west of the zone was received up to 17 miles away. Signals from the beacon on DZ A were also received, but were readily distinguished from the correct ones by their coding and by their position on the Rebecca scope. The lighted T supposed to mark the zone was not observed. The enemy thereabout were so numerous and active that the pathfinder troops had been unable to operate the lights. Except that the lead pilot of the 441st made some use of Gee to check his position, the three serials relied on Rebecca-Eureka or on visual recognition to locate the zone. The Rebecca was a poor guide at close range, and the cloud-swept landscape proved hard to identify. Many stragglers from the first serial of the 441st and some from other serials had to make two or three passes to orient themselves. Some of them grew completely confused and ended up by making drops many miles from the drop area. However, most pilots believed that they had achieved accuracy, and only one, a member of the 441st Group, gave up after three attempts and went home with his load.

At 0126, five minutes ahead of schedule, the first serial of the 441st started its drop. The next began at 0134. Between them they carried 1,475

\*One account states that some planes had not turned off all their lights and so attracted fire. (Hist 302d TC Sq, Jun 44.)

†One aircraft had collided with a bundle dropped by a plane ahead of it. (Hist 301st TC Sq, Jun 44.) Considering the huge number of planes and the general failure to keep formation, it is almost miraculous that there were not more accidents of this sort.

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Map 4.

troops, of which they dropped at least 1,429. Returned were one soldier who had fainted and 12 who had slipped in vomit and had become entangled. The drop by the 440th Group began at 0140. Out of 723 troops carried 719 jumped. Flak had wounded one man, and he had blocked the exit of the other three.

The return of the ALBANY serials was generally uneventful after they left Normandy. Over the Channel the sky was becoming overcast, but the clouds were above 4,000 feet, and visibility was good. In southern England there were scattered squalls, one of which caused returning planes to stack up for a time over Membury. Except in the 438th and 440th Groups most of the pilots returned singly or in small formations. Some must have wandered far and wide, for the flow of returnees lasted from 0210 when the first plane reached Greenham Common until about 0430.<sup>12</sup>

The airborne units which the 440th and 441st Groups had been responsible for dropping on DZ D had been assigned to cover the left flank of VII Corps by holding or destroying all crossings of the Douve below its junction with the Merderet. Although protected by the river from German forces to the south, they were six long miles away from UTAH Beach, and their task turned out to be much more difficult than had been expected.

The 1st Battalion, 501st PIR, was to seize and hold a lock at la Barquette half a mile south of DZ D and only a mile and a half north of Carentan. Besides its utility as a crossing, the lock was valued as a means of controlling the tidal flooding of the Douve marshes.\* The 2d Battalion and engineers with it were to seize and demolish the bridges over the Douve on the north-south highway to Carentan about a mile southwest of la Barquette. The 501st had as secondary objectives the taking of St. Côme-du-Mont and the destruction of a railroad bridge across the river about a mile west of the highway. The 3d Battalion, 506th PIR, was to take two wooden bridges in the le Port area a mile and a half east of la Barquette.

The headquarters and first battalion of the 501st PIR had received only a partially satisfactory drop. Some 19 planes, including the three in the lead element of the serial put their sticks on DZ D or close to its southern edge. Two others came within

a couple of miles of it. On the other hand, the whole last flight veered north of course onto a line passing close to DZ C. Eight of its nine loads landed between two and four miles northwest of DZ D between Chef-du-Pont and DZ C, and the other was about three miles further east on the same line of flight. One stick came down about seven miles north of the proper zone. These sticks at least landed within the 101st's prescribed perimeter, but another nine had been scattered from 4 to 10 miles south of DZ D in the Carentan area on the far side of the Douve. One stick probably went down with its plane, and four others carried by the serial are unaccounted for.

Those troops who did come down near the zone were involved in fighting from the start. The battalion commander was killed and his executive officer was captured. None of the company commanders were on hand. Through a fortunate accident the regimental commander, Colonel Johnson, was present to take charge. His pilot had given the green light a little too soon, but a bundle stuck in the door had delayed the jump until the plane was exactly over the zone.

Johnson gathered men from various units until he had about 150, and worked his way toward la Barquette. At dawn his men rushed the lock, found it undefended, and were dug in before enemy sentries on the other bank realized they were there. The German guards, few in numbers, made no attempt to counterattack, but as a result of their observations German artillery soon began shelling the lock area. Once established at the lock, Johnson sent patrols westward in hopes that the highway bridges could be taken with equal ease, but every advance in that direction was halted by intense fire. Clearly the bridges could not be taken without a hard fight.

The colonel therefore returned to the drop zone with about 50 men to seek reinforcements. At 0900 outside Basse Addeville he found his S-3 with about 100 miscellaneous troops already engaged with enemy forces north and west of them. Most of Johnson's regiment seemed to have vanished, but he learned presently that half his 2d Battalion was fighting less than a mile to the north near the hamlet of les Droueries. This force twice tried to break through to him but was stopped both times by the enemy. In contrast to intelligence reports which had indicated that the only German unit in the area was a single platoon, the entire

\*This flooding never became necessary. It probably would not have been quick enough to be effective had the Germans launched a sudden assault.

3d Battalion of the enemy's 1058th Regiment was there and was fighting tenaciously.

No word was received from division or corps, but at noon an encouraging bulletin from the BBC led Colonel Johnson to attempt a second advance on the highway bridges by way of la Barquette. He left 50 men to hold Basse Addeville, and marched off about 1330 toward the lock. This movement drew heavy artillery and mortar fire from the south near Carentan and from the northwest near St. Côme-du-Mont. A naval fire-control officer who had dropped with the regiment made radio contact with the fleet, and accurate naval gun fire subdued the mortars around St. Côme. Nevertheless stiff resistance blocked every effort to push toward the bridges. All that could be done was to consolidate the position around the lock.

After receiving one of the best drops in either ALBANY or BOSTON the 2d Battalion of the 501st had a hard and seemingly fruitless day. At least 40 of its 45 sticks had come down on or within a mile of the drop zone, mainly near its southern edge.\* The battalion commander, Lt. Col. Robert A. Ballard, was able to collect about 250 men for an attack on St Côme-du-Mont, but unexpectedly strong and determined enemy forces threw back his attacks at the hamlet of les Droueries, half a mile from St. Côme. They also blocked his subsequent attempts to join forces with Colonel Johnson. Even after the control officer with Johnson had called down naval gunfire on the hostile positions Ballard's men were unable to make much headway. On the other hand, by keeping the Germans around St. Côme on the defensive, his battalion may have prevented a counterattack against the exposed positions of the paratroops at la Barquette.

The 3d Battalion, 506th PIR, had been given a good drop by the 440th Group. About eight of its sticks landed on the zone and 26 more within a mile of it, the principal concentration being near the eastern end. Only two sticks, dropped some 13 miles to the south are known to have landed far from their goal.

Unfortunately the Germans were ready and waiting and had converted the drop area into a deathtrap. The moment the jump began an oil-soaked building burst into flame, and by its light machine guns and mortars mowed down the paratroops before they could get clear of their chutes.

Both the battalion commander and his executive were among the slain. The survivors had all they could do to assemble and maintain themselves.

The battalion S-3, Capt. Charles G. Shettle, descended in slightly safer territory in the southern part of the zone. After only a momentary pause to assess the situation he hurried off toward the le Port bridges with only 15 men, leaving the rest of the battalion to follow if it could. This seemingly reckless haste paid high dividends, and was to exercise a considerable influence on paratroop tactics. Picking up another 18 men along the way, Shettle reached the bridges at 0430 and quickly occupied their western ends. After 20 more paratroops joined his group he sent patrols across to the far bank. However, German pressure forced them to withdraw two hours later largely for lack of ammunition. With only about 30 rounds apiece the paratroops had to husband their resources. Contact was made during the day with Johnson's force at the lock, but he was in no position to provide assistance.

That night 40 more troops, said to have been dropped near Carentan, managed to reach Shettle's position. At 0200 the Germans attempted to cross one of the bridges, but recoiled when the paratroops poured a volley into them at close range. Thereafter the enemy contented themselves with keeping Shettle's group under constant harassing fire from across the river. However, the Americans prepared the bridges for demolition in case of a more formidable attack. Thus at dawn on D plus 1 Shettle and Johnson held defensive positions at the lock and the two wooden bridges with the equivalent of less than two companies of troops almost without ammunition, food and water. Colonel Johnson put out panel signals at dawn for aerial resupply. Supplies were dropped at 0630, but they fell in the marshes or in areas exposed to German fire and could not be recovered.

About noon Shettle sighted some P-47's and set out signal panels requesting a bombing mission against the enemy positions across the river. The mission arrived about 0430, but, through some misunderstanding, strafed the American position and destroyed both bridges by accurate skip bombing before frantic waving of orange identification panels led the fliers to shift their attacks to the other side of the Douve.

What had been achieved was important. What had not been done could have been disastrous.

\*One was 1½ and another 2½ miles away.

The paratroops on DZ D had failed in their overall objective, the sealing off of the southern flank of the UTAH beachhead. From Carentan to beyond St. Côme-du-Mont the north-south highway and its bridges over the Douve remained in German hands. Through this gateway the Nazis could and did, launch a counterattack.

At about 0600 on D-day the commander of the German 6th Parachute Regiment, stationed near Périers, southwest of Carentan, had received orders to attack northward toward Ste Mère Eglise. He moved his regiment to the vicinity of Carentan, reconnoitered the situation at St. Côme, and about noon ordered two of his battalions to join him there. They crossed the river during the afternoon and struck northward from St. Côme about 1900. With many skirmishes, but no major engagements, the first battalion reached the vicinity of Ste Marie-du-Mont before midnight. The second, somehow slipping behind American positions around les Forges, may have come within a mile of Ste Mère Eglise, which was its objective.

The size of the American buildup had already been such that it would have taken two regiments of Germans rather than two battalions to create a threat to the UTAH operation. Nevertheless, by resolute action these thrusts could have caused enough trouble to delay VII Corps for many days. Actually they accomplished little. During the night the German regimental commander, gradually realizing the odds against his men, ordered them back. The second battalion got the order and returned safely to St. Côme. The first battalion, which did not acknowledge the order, and may not have received it, retired southward next morning. Unable to make contact with its comrades, it marched without reconnoitering toward the crossings at la Barquette and le Port in apparent ignorance that the Americans held those points. About 1600 the battalion approached the river.

It was disconcerting to the Americans to see such large forces advancing unexpectedly on their rear, but it was doubtless more so for the Germans to receive rifle and machine-gun fire from ambush at close range and to find their retreat suddenly cut off. In the ensuing battles some 800 German paratroops were defeated by about 250 American paratroops under Johnson and about 100 under Shettle. Shettle made adroit and aggressive use of patrols to convince the Germans in his sector that his force was too much for them. They trickled

in squad by squad until he had 255 prisoners. In the lock area such disintegration was checked by Nazi officers who shot anyone who showed signs of surrender and wounded Colonel Johnson himself, when he advanced to offer terms after hearing cries of "Kamerad." Later Johnson did succeed in conferring between the lines with a German enlisted man and sent him back with an ultimatum to surrender in 30 minutes or be "annihilated by our superior forces." Almost on the deadline the Germans began surrendering. This capitulation, also, was a piecemeal process with officers coming in last a little after nightfall. The force at the lock had inflicted about 150 casualties and taken 350 prisoners at a cost of 10 men killed and 30 wounded. It was an extraordinary victory for courage and bluff over a unit supposedly better than most the Germans then had in Normandy.<sup>13</sup>

While this success was being won, a relief column was fighting its way south from the vicinity of DZ C. Late on D-day General Taylor, out of contact with his forces on the Douve front, had directed Colonel Sink to take the 506th PIR (less the 3d Battalion) on a reconnaissance in force through Vierville to the river. The 506th marched south on the morning of the 7th with more than 600 men. They encountered stiff resistance after passing through Vierville, and only with the aid of two platoons of tanks, which proved invaluable in knocking out machine-gun nests, were they able to fight their way to the vicinity of Angoville, where Sink and one battalion managed to join forces with Colonel Ballard's group. Together they drove salients north and south of les Droueries but were unable to take the strongly defended positions around that hamlet.

The attack by V Corps in the OMAHA Beach sector south of the Vire was not going well, and on the 7th General Bradley, on orders from Eisenhower, gave VII Corps as its primary goal the taking of Carentan, since this was the one point essential to a link-up of the two corps. The best and shortest way to Carentan was blocked by two German battalions holding les Droueries and St. Côme. In order to crush their resistance Colonel Sink was heavily reinforced. On the night of the 7th he received the 3d Battalion, 501st PIR, a battalion of glider troops (brought in over the beaches), eight light tanks, and a battalion of field artillery with 105 mm. guns.

At 0500 on the 8th Sink launched an attack by

the four airborne battalions. This was preceded by artillery preparation and a rolling barrage ahead of the troops. After hard fighting the enemy withdrew during the afternoon, hammered back the 3d Battalion of the 501st, which had pushed into their path, and retreated across the Douve, blowing up one of the highway bridges and the railway bridge as they went. The 101st Division had accomplished its initial mission and had consolidated its lines along the Douve. However, to do so against the opposition of two battalions had required two and a half days and the help of tanks and artillery brought in by sea.

On the 9th the division paused to reorganize for its drive toward Carentan. This pause may be taken as the end of the airborne stage of its operations. The subsequent attack by the 101st which made contact with V Corps on 10 June and took Carentan on 12 June was made as a ground unit striking out of an organized beachhead.<sup>14</sup>

### **BOSTON Mission and the Paratroop Operations of the 82d Division**

The 82d Division's paratroop mission, BOSTON, was flown by the 52d Wing and the attached 442d Group from their bases around Grantham in the north of England. The serials were to assemble over their bases according to group SOP's, pass over the wing assembly point at six-minute intervals, and fly the course already taken by the pathfinders from there to HOBOKEN, PEORIA, and the drop zones. Between the command assembly point and the IP the lead plane in BOSTON was to fly 10 minutes behind the leader of the last serial in ALBANY.

The first plane took off about 2300, and by 0002 all were in the air except one in the 315th Group which did not go because a paratrooper's grenade had exploded before take-off, making a shambles of the rear of the aircraft. The fastest departure appears to have been that of the 61st Group from Barkston Heath. Taking off in elements of 3 at 7-second intervals, it put two 36-plane serials in the air in 2½ minutes apiece.

The weather was favorable. The moon shone brightly through high, scattered clouds and visibility was generally excellent. Under these conditions the Eureka beacons and flashing aerial light-

houses at 30-mile intervals made it easy to stay on course, and the bright lights on the planes made it easy to keep formation during the trip to the south coast. One pilot said it seemed as though they were following a lighted highway. The marker ships proved equally efficacious, and, as in ALBANY, all serials appear to have approached Normandy on course and in formation.

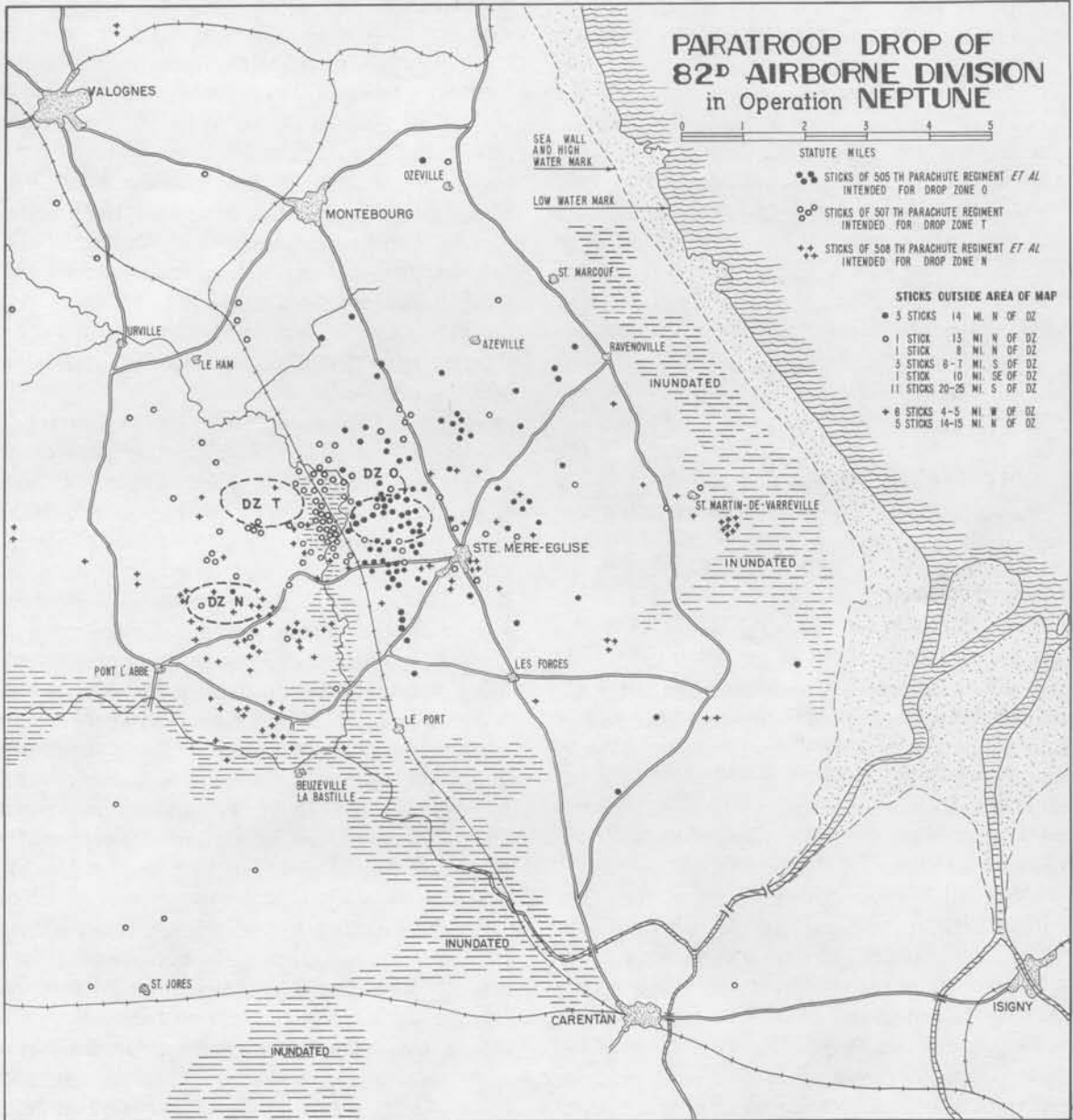
The first three serials in BOSTON were to drop the 505th Parachute Regiment between 0151 and 0208. The lead serial, 36 planes of the 316th Group, carried the 2d Battalion. Another 36 from that group took the 3d Battalion of the 505th, two 75 mm. howitzers, and 20 artillerymen of the 456th Parachute Field Artillery Battalion. Then came 47 planes of the 315th Group bearing the Headquarters and 1st Battalion of the 505th and a platoon of engineers. With them was General Ridgway, who had decided a few days earlier to parachute in rather than come, as previously planned, by glider.

The destination of these serials, DZ O, was an oval about a mile long from west to east and half a mile wide from north to south extending from half a mile northwest of Ste Mère Eglise almost to the east bank of the Merderet. It was to be marked by Eureka beacons and green T's. From a pilot's viewpoint it was conveniently boxed in on the west by the Merderet, on the south by a road running west from Ste Mère Eglise, and on the east by the north-south highway.

All three serials carrying the 505th apparently sighted the cloudbank over the western Cotentin soon enough for most of the planes to climb over it without losing formation. The clouds shielded them from observation, and by following a different route from ALBANY they achieved a degree of surprise. All three crossed the coast without opposition and even the last was four miles inland before it was fired upon. Such fire as was encountered was sporadic and ineffectual and was mostly from rifles and machine guns. No planes were lost. The 316th had a dozen slightly damaged, and 11 in the 315th required minor repairs. One flak burst which wounded seven paratroops aboard a plane of the 315th prevented that stick from jumping. However, the clouds above the zone were more of a hindrance than the enemy.

The pathfinder troops on DZ O had put their Eureka in operation by 0125. The first serial received its responses clearly when 15 miles away,





Map 5.

and the third did so at distances up to 21 miles. The pathfinders also had three T's of green lights gleaming on the zone, one for each battalion, but not until it was almost on top of the lights did the lead serial see them through a break in the clouds. In consequence it made a high drop from about 1,000 feet. Some pilots overshot and dropped troops east of the zone. Others who overshot or straggled off course made another pass. The second serial had begun a descent through the clouds on Rebecca before reaching the DZ and dropped on the T. The 315th Group's serial had to change its course and lose altitude rapidly after it sighted the T but was able to drop over the zone from about the proper height. At least one of its pilots missed the zone in the overcast, turned back at the coast and dropped at what he believed to be the alternate zone, DZ D. Although accounts differ, the first drops were probably made about 0145 and the last about 0204. As in so many other cases the arrival had been slightly ahead of schedule.

Of 1,276 troops aboard planes of the 316th Group, all but two jumped, and all but 28 out of 844 carried by the 315th did so. Of those brought back, 7 paratroopers had been wounded by a flak burst on one plane of the 315th, and 4 had refused to jump.<sup>15</sup>

The drops at DZ O were, taken together, the best at any zone by IX TCC in NEPTUNE. Half the troops dropped were assembled and ready for action within eight hours. Among the factors contributing to this were the success of the 316th and 315th Groups in climbing over the cloudbank and descending to the DZ without losing formation, the absence of intense enemy fire during the approach and over the zone, and the lighted T. This last was an aid not available on the other zones, except at DZ A where the lights went on too late for the first serials. Its presence at O appears to have been important, since after seeing it two of the serials had to make hasty changes in course and altitude in order to drop correctly.

Of 118 sticks delivered in Normandy and intended for DZ O, 31 landed on or barely outside the zone, approximately 29 more came within a mile, and at least an additional 20 were within two miles of it. Some 17 were scattered within or just outside a 5-mile radius. Only three sticks, dropped 14 miles north of the zone, were certainly outside the objective area, but several were missing or unreported.<sup>16</sup>

The 505th Regiment was responsible for an area extending westward from the 101st Division sector at Beuzeville-au-Plain to the Merderet and from les Forges, initially a 101st Division responsibility, northward to include Neuville-au-Plain. In the center of this area was Ste Mère Eglise, next to the causeways the most important objective of the airborne troops. In American hands it would be the hub of communications within the beachhead. Without it the line of the Merderet would scarcely be tenable, and units on the west bank of that river would probably be cut off.

The 2d Battalion of the 505th was to hold the northern perimeter from Beuzeville to the river. The 3d Battalion was to take Ste Mère Eglise. The 1st Battalion was to send one company to seize the Merderet crossings at la Fièvre, 2 miles west of Ste Mère, and at Chef-du-Pont, which was about 2 miles west of les Forges. The rest of the battalion was to be in reserve.

Almost no initial opposition was met on DZ O, so the well-concentrated troops were able to assemble quickly. By 0820 32 officers and 303 men of the 2d Battalion were organized and ready for action. The battalion commander, Lt. Col. Benjamin H. Vandervoort, had broken his leg in the drop but continued in charge of his unit. Soon after dawn he gave orders to set out northward toward Neuville-au-Plain, but the movement was halted by the regimental commander, who had not heard from the 3d Battalion and was worried about the situation in Ste Mère Eglise. After three hours of uncertainty Vandervoort's men were ordered to advance into that town. Arriving shortly before 1000 they found the 3d Battalion already in full control of Ste Mère Eglise, but hard pressed by counterattacks from the south.

The 3d Battalion had also received a good drop. Lt. Col. Edward C. Krause, the battalion commander, after descending, exactly as planned, beside his unit's assembly point on the south side of DZ O, had organized a system of search parties which within 45 minutes gathered in 180 men from his own battalion plus some from other units. They were just starting for Ste Mère Eglise when they met a Frenchman who told them that most of the German garrison had been moved to positions outside the town for fear of Allied bombing, and that he could lead them in safely by a back road. He was as good as his word. Moving silently and swiftly, with strict orders from Krause not to use

firearms, the battalion stole into Ste Mère Eglise and before dawn had occupied all key points and manned a ring of roadblocks around it. Krause himself cut the Cherbourg-Carentan cable. The garrison, mostly anti-aircraft artillerymen, had been so surprised that their resistance was negligible. About 30 of the enemy were taken prisoner, including some captured in bed; 10 were killed; and the rest fled southward. A runner with news of this success reached General Ridgway, but, in the excitement, failed to report to the regimental commander.

Krause had instructed his troops to follow him to Ste Mère if they missed him on the drop zone, and by 0900 enough had joined him to bring his strength to over 300 men. He needed every one of them, for at 0930 the Germans attacked from the south with about two companies of infantry supported by guns and tanks. The situation was eased by the arrival of Vandervoort's battalion. It took over the northern and eastern sides of town, while Krause's men concentrated on the south.

By 1130 the attackers had been stopped, and Krause ordered 80 men to strike at their western flank. This show of strength, intimidated the enemy into making a substantial withdrawal. They made no further attacks until dusk when they advanced again after a preliminary shelling. The 505th turned them back easily and classed the fight as hardly more than a strong patrol action. The enemy forces involved were the 795th Georgian Battalion, 91st Division, and some other elements of that division. The paratroopers task was eased by the fact that the Georgians were not eager to fight and their German officers, cut off from higher headquarters, were uneasy and hesitant.

Not until late on D-day did the Germans exert much pressure on the northern perimeter of Ste Mère Eglise. In the morning about two companies of the 1058th Grenadier Regiment had attempted an attack down the north-south highway, but they had been held up from 1030 to about 1700 by the heroic action of a single platoon which Vandervoort had sent that morning to serve as outpost at Neuville. Only 16 out of 44 men in the platoon got back, but their stand had cost the Germans time which they could ill afford to lose.

The last drop on DZ O, that of Headquarters and the 1st Battalion of the 505th PIR by the 315th Group was on a par with those by the first two serials. By 0600 the regimental CP was in

operation in an orchard 1,200 yards west of Ste Mère Eglise, and with it was the divisional CP, established by General Ridgway, who had been given a most accurate drop by Capt. Chester A. Baucke of the 52d Wing. By 0930 the 1st Battalion had assembled 22 officers and 338 men, and by then or a little later regimental headquarters had mustered 12 officers and 61 men.

Two hours after the drop Company A, which then numbered 11 officers and 132 men, was dispatched to take the crossing at la Fièvre. At daybreak as it was approaching its objective it met large bodies of troops from the 507th and 508th Regiments. Together they attempted to reach the bridge but were held short of it throughout the morning by machine-gun fire from a small detachment which the Germans were said to have put there for the first time a day or two before. Early in the afternoon contingents of the other regiments rushed the bridge but the attack failed, and as a result Company A, which had remained on the east bank in a support role, was left almost alone to face an impending counterattack. The rest of the 1st Battalion of the 505th was hastily called to la Fièvre to meet this threat.

The Germans hammered the battalion for the rest of the day with mortars and artillery and attacked twice across the bridge using infantry of the 1057th Grenadier Regiment and light tanks of the 100th Panzer Replacement Battalion. Both attacks were repulsed but, in the first two, tanks got almost across the causeway before being knocked out by bazookas. The second attack crossed the river, overran the 1st Battalion CP and forced the battalion to drop back temporarily. Needless to say, the 505th had been unable to spare any men for its mission to Chef-du-Pont. Instead, about 1500 hours, some 200 men of the 507th and 508th Regiments who had been attempting to take the crossing there had to be rushed north to la Fièvre to assist the 505th, leaving only a platoon at Chef-du-Pont. With their help the Germans at la Fièvre were pushed back west of the river.

Thanks to the good drop they had received, more than three quarters of the troops in the 505th PIR had reported to their units by nightfall on D-day. They were needed, for casualties had been heavy, and no relief was in sight. The troops at Ste Mère Eglise had 44 dead, 130 wounded in hospital, and many wounded still fighting, including Colonels Krause and Vandervoort. At la Fièvre

the 1st Battalion had 20 dead and over 150 other casualties. For artillery the 505th had only one of the two howitzers dropped in BOSTON\* and 6 out of 16 antitank guns brought in DETROIT, the predawn glider mission. Ammunition of all types was running very low. However, the rank and file of the 505th, battle-hardened in Mediterranean campaigns, felt themselves equal to the situation. "We're staying right here," they told the French that night.

The commanders of the paratroops were more worried than their men. Radio contact with headquarters in England had not been established, although one large radio was available, and attempts were made to use it. More serious was the inability of the 82d to get in touch with VII Corps, 4th Division or even the 101st until late on D-day. The first radio contact was made with 4th Division about 2100. About the same time a patrol of the 505th PIR met one from the 4th Division near Beuzeville, but it brought back little information. Not until the morning of the 7th when a staff officer of the 82d who had gotten through to the 4th Division CP returned from a midnight conference there did Ridgway know that his east flank was secure and that help was coming.

Equally welcome was the news that the enemy south of the 505th was no longer a serious threat. On the afternoon of D-day the 8th Infantry Regiment, whose progress from UTAH Beach through the 101st Division sector has already been described,† had pushed one of its battalions to the vicinity of Turqueville 1½ miles southeast of Ste Mère Eglise and its other two battalions beyond les Forges, one company almost reaching Chef-du-Pont. The advance penned the 795th Georgian Battalion and other enemy troops on a strip of high ground stretching about two miles southwest from Turqueville across the north-south highway. Others, separated from the rest by the 8th Infantry salient, held out further south at Carquebut.

The 8th Infantry preferred to consolidate its gains rather than risk further action that day, and a seaborne detachment of 93 men of the 325th Glider Infantry, reinforced by a cavalry reconnaissance platoon and a company of light tanks, which had been detailed to clear the les Forges area for glider landings, proved too weak to make much

headway. Thus the encircled enemy west of Turqueville was able to play hob with the glider missions.\*

On the morning of D plus 1 the 8th Infantry and the detachment from the 82d Division attacked the Turqueville wedge. At Turqueville most of the German officers pulled out as the attack started, and over 150 Slavic and Asiatic conscripts were then talked into surrender by American prisoners.† At other points resistance was stiff, but by 1030 the wedge had been wiped out. A battalion of the 325th Glider Infantry, which had landed near les Forges early in the morning, was sent about noon to deal with the Germans at Carquebut. It found the place deserted. The enemy had fled. However, they reinfiltred later and had to be driven out again next day.

North of Ste Mère Eglise the Germans were able to launch a formidable attack on 7 June, employing the 1058th Grenadiers, reinforced by the Seventh Army Sturm Battalion, approximately three battalions of artillery, and some tanks or self-propelled guns. This action created such concern that the commander of VII Corps detached a reinforced tank company from 4th Division reserve to protect the 82d Division from attacks by enemy tanks. This force engaged an enemy column just north of Ste Mère Eglise, then swung northeast around its flank toward Neuville-au-Plain, causing the Germans to withdraw their guns and vehicles hastily for fear of being cut off. German infantry remained ensconced in ditches and hedges northwest of town until in mid-afternoon the 2d Battalion of the 505th and the 2d Battalion, 8th Infantry, which had moved up to Ste Mère Eglise, launched a coordinated attack supported by tanks. They outflanked the Germans and defeated them, inflicting heavy casualties.<sup>17</sup>

Thus by the end of D plus 1 the 505th PIR was part of a solid beachhead extending inland to the Merderet. All regimental objectives east of the river had been taken except Neuville-au-Plain, which fell next day, and troops from the beaches were moving up to take over most of its northern front. Behind it in divisional reserve were over 1,700 officers and men of the 325th Glider Infantry Regiment, brought in that morning by gliders

\*The breechblock of the other landed on ground swept by enemy fire and was not recovered.

†See above, pp. 41-42.

\*See below, p. 67.

†Capt. William J. Adams, a captured glider pilot, was later awarded the Silver Star for his part in persuading them to give up.

in GALVESTON and HACKENSACK missions. Divisional artillery was still weak. Only 6 out of 13 antitank guns and 3 out of 24 howitzers brought by the ELMIRA glider mission on the evening of D-day went into action on D plus 1. However, adequate ammunition supplies had been retrieved from the gliders, and next day 11 more of the glider-borne howitzers were hauled to the 505th's sector and began firing. Meanwhile, beyond the Merderet things had not gone so well. Not only had the 507th and 508th Regiments failed to achieve their objectives, but large portions of them were in danger of destruction.

The 508th Parachute Infantry Regiment and a detachment of divisional headquarters had been carried by serials of 36 and 24 aircraft from the 314th Troop Carrier Group and by two serials of 36 planes each from the 313th Group. The lead serial was scheduled to make its drop at 0208. The regimental mission was to hold the southern half of the bridgehead which the 508th and the 507th were supposed to establish beyond the Merderet. The sector assigned to the 508th was a rough quadrangle extending about three miles west of the Merderet and about two miles north from the Douve. The bridge over the Merderet at la Fièvre was just outside the northern edge of this area.

All four serials were to drop on DZ N, a relatively small zone, about a mile long on the axis of approach and half a mile wide from north to south. It lay 1½ miles west of the Merderet and almost two miles north of the Douve in flat country checkered with hedgerows. Touching its southern edge was a highway running southwest from la Fièvre to Pont l'Abbé, a town on the Douve about 1½ miles southwest of the zone. About a mile south of DZ N was the hamlet of Picauville. Unknown to the Allies, the German 91st Division had recently established its headquarters a little way north of Picauville and had stationed considerable forces in that area.

Less fortunate than the serials going to DZ O, those intended for DZ N had run headlong into the cloudbank a moment after crossing the coast at PEORIA. Most of the 314th Group apparently stayed in the clouds until within three miles of the zone. Near the DZ they met with some flak and much machine-gun fire, but, thanks to the protecting clouds, only 18 aircraft were damaged, almost all lightly. However, one plane was shot down

over the zone after making three passes to drop its troops. The jumpmaster had called the first pass too low, and flak had spoiled the second. The crew survived and reached the Allied lines that night. The pilot of another plane was killed on his second pass, but the co-pilot completed the sortie.

The 313th Group was harder hit than its predecessor, mostly by accurate small-arms fire. One plane crashed in flames after making its drop. Another, burning and with damaged engines, ditched on the way back. A third was missing. The group brought back 21 planes with slight damage, 11 needing moderate repairs, and one badly damaged.

Flying blind until almost at the DZ and harassed by enemy fire as they emerged from the clouds, these four serials were peculiarly in need of pathfinder assistance. They got very little. The pathfinder troops had landed more than a mile southeast of DZ N and found enemy forces blocking their way to the zone. In this dangerous situation all they could do was to operate a Eureka and two amber lights. They reported later that the Eureka was on in ample time and was "triggered" by Rebecca signals at 0156 when the first planes of the 314th were still over 12 miles away. However, only the first serial of the 313th Group reported receiving usable signals from the Rebecca. Some members of other formations picked it up but had poor reception, possibly due to jamming. A few pilots did see the amber lights and used them as a guide. Although the pathfinders turned on their BUPS beacon, there is no evidence that any of the few navigators who had SCR-717 made use of it in selecting their drop point.

The leaders of both serials of the 314th and the rear serial of the 313th Group relied on Gee to establish their position and obtained fairly good results. The most successful was Lt. Col. Clayton Styles, commander of the 314th Group, who placed his stick in good position on the south side of the zone. In the stick was Lt. Col. Thomas J. B. Shanley, commander of the 508th's 2d Battalion, an officer destined to play an important part in the coming battle. The leader of the second serial made his drop about two miles north of DZ N. The leader of the third, using Rebecca-Eureka gave the jump signal in the vicinity of the pathfinders. The fourth leader made a fairly accurate drop on Gee. Thus, if the serials had held to-

gether, about half the paratroops intended for DZ N would have come down on or close to it and almost all would have been within two miles of it. In fact all four serials had disintegrated leaving only a small minority in formation behind the leaders.

Of 2,188 paratroops slated for DZ N, 2,183 had been dropped. Two had refused to jump, two had fouled chutes and one was wounded. Over 95 percent of the 63 tons of supplies and equipment carried had been delivered, but a large part of the men and materiel landed far away from the drop zone. About 17 out of 132 sticks did land on or very near to DZ N, and another 16 were within a mile of it. Most of the latter were located beyond the zone, indicating that the pilots had been a little slow in recognizing their position. Perhaps they had seen parachutes beneath them or the Merderet ahead. Some 30 additional planeloads came down within a two-mile radius of the zone. Half of these were in the general vicinity of the pathfinders. The pathfinder beacons were near the Douve, and several sticks fell into the river. No less than 34 pilots went past DZ N, crossed the Merderet, and dropped their loads between DZ O and the coast. At least three of these set their drops by the green T on DZ O, 9 put their sticks near Ste Mère Eglise, and 10 dropped near St. Martin-de-Varreville, which was six miles east of DZ N. Most of the troops dropped east of the river fought on D-day with the 505th PIR or the 101st Division, then assembled on the 7th, and reported to their regimental commander, on the east side of the Merderet near DZ O. A number of jumps were made prematurely with the result that eight sticks descended between three and five miles short of DZ N. Through gross errors two sticks were dropped near Valognes, nine miles north of DZ N and five were dropped about 15 miles north of the zone. The directional error in those cases is so great that it seems as though the pilots must either have gone off course before reaching PEORIA or circled for a second run and lost their bearings completely. Approximately 20 sticks went unaccounted for.

Broadly speaking, then, about a quarter of the 508th Parachute Regiment was dropped within a mile of its zone; one quarter was within two miles of it; another quarter was unable to perform its assigned mission because it had been flown past DZ N and dropped on the wrong side of the

Merderet, and most of the remainder was ineffective because of dispersed drops in remote or dangerous places.<sup>18</sup>

The regimental commander, Col. Roy Lindquist, and the divisional paratroop commander, Brig. Gen. James M. Gavin, were dropped by the second serial of the 314th Group, came down about two miles north of DZ N within the territory of the 507th PIR, and joined forces with elements of that regiment. Their activities, can best be discussed later in connection with the 507th. The only important operations on D-day west of the Merderet by members of the 508th were conducted by a group which coalesced gradually around Lieutenant Colonel Shanley on the south side of the drop zone.

After his jump Shanley had quickly collected 30 men by hanging bundle lights in a tree, and then had sent out patrols for more. The next morning he made radio contact with two other groups of platoon size or less. It is a striking fact that although both were within a mile of him, neither was able to join him until the middle of the afternoon. They had had to feel their way cautiously through a maze of thick, high, almost impenetrable hedges, stopping at intervals to skirmish with enemy patrols. The hedges were both an impediment and a shield. The German 91st Division had a battalion of the 1057th Grenadier Regiment in that area and other units nearby with artillery and tanks, enough to have treated the scattered bands of paratroops very roughly in open country. As it was, the Nazis' movements were blind and hesitant.

Shanley's battalion had had the mission of moving south to destroy the highway bridge across the Douve at Pont l'Abbé and defend the north bank of that river from Pont l'Abbé to the Merderet, but after finding his way to the Douve blocked by superior forces Shanley decided to take defensive positions on Hill 30, a partially wooded rise about a mile to the east of him. The hill overlooked the Merderet half way between the la Fièvre bridge and that at Chef-du-Pont. It took him from late afternoon until almost midnight to cover that one mile. Near the hill he picked up a body of about 200 leaderless and bewildered paratroops. Had those troops attacked the bridge at Chef-du-Pont earlier in the day they could probably have taken it and saved the division much trouble. In the interim the Germans had manned the approaches to the

crossing, but they had not yet occupied the hill. Shanley beat them to that. There for the next three days he and his men acted as a kind of shock absorber on which the Germans expended much of their striking power. Shanley had radio contact with divisional headquarters, and was able to get some artillery support. Aside from that his group held out unassisted.<sup>19</sup>

The last phase of the BOSTON paratroop mission was to be the dropping of the 507th Parachute Regiment on DZ T beginning at 0232. The regiment was carried by two serials of 36 planes each from the 61st Troop Carrier Group and one of 45 aircraft from the 442d Group. Five miles before reaching the zone these serials would cross the upper Douve at a point where it was spanned by a long causeway. After that there were no distinctive landmarks short of the Merderet, which flowed just beyond the east end of the DZ, much too close as it turned out. The zone itself was an oval about 1¼ miles long on the axis of approach and half a mile wide, lying on flat alluvial ground 1½ miles north of DZ N, and about the same distance northwest of the la Fièvre bridge. A thousand yards northeast of the DZ loomed the embankment of the Valognes-Carentan railway slanting south-eastward across the Merderet to la Fièvre.

The 61st Group had some trouble with the clouds, but most of its lead serial held together. The Group suffered little from ground fire. One pilot whose plane was hit within sight of the zone dropped his troops but crashed later. He and his crew bailed out safely. Only six other aircraft of those two serials were hit, and none seriously. The 442d Group had a harder time. Its formation ran into the overcast and dispersed. It was also the target of more fire, principally medium to intense light flak and small-arms fire near the drop zone. One plane was hit over western Normandy and had to crash-land after first dropping its troops many miles short of their goal. Another was missing with all aboard. One with both engines dead was ditched successfully on the way home. Among those returning were 28 with slight and 3 with medium damage.

The pathfinders on DZ T had scored a bulls-eye on their zone, but they found enemy units so near them that they dared not use their lights. They did turn on their Eureka at 0212 and received Rebecca signals at 0217. The incoming serials received the responses very well, and relied on Rebecca in

making their drop. The leader of the 442d Group also picked up the responses of the Eureka south of DZ N. Checking it by Gee, he recognized that its location was wrong and also noted the difference in coding. However, about half of his formation were straggling, and there is reason to believe that some of them did drop troops on the wrong beacon. The first plane of the 61st Group made its drop at 0226 and the last at 0245 or later. The main body of the 442d dropped its troops between 0239 and 0242. Of 1,187 troops carried by the 61st Group all but one man, who refused to jump, were deposited in Normandy. Of 750 carried by the 442d Group, all jumped with the possible exception of the one stick aboard a missing plane.

On the whole the drop was better than that of the 508th Regiment. Two or three sticks landed on the zone, and about 50 more came within a mile of it. Unfortunately many pilots had overshoot, by between 1,000 and 1,500 yards, causing their troops to land in the swampy backwaters of the Merderet. The water was shallow at most points and few men were drowned, but the rest, floundering in the water with most of their equipment at the bottom of the river were in sorry state to start a battle.

Another 22 sticks came down within approximately two miles of DZ T. The rest, with one odd exception, were scattered. About 16 landed between 2 and 5 miles from the zone, 11 more within a 10-mile radius of it, one 13 miles to the north, and one 25 miles to the south. The only concentrated drop away from the zone was made by 10 pilots in the second serial of the 61st Group who wandered to the vicinity of Montmartin-en-Graignes, 18 miles southeast of DZ T, and dropped about 160 paratroops of the 3d Battalion of the 507th Regiment there. This was the worst error by a formation of such size in either ALBANY or BOSTON. Once again the most plausible explanation is that after some mix-up in the clouds the pilots had fallen in behind a straggler who was not using radar. That they followed their false leader unquestioningly on such a wild-goose chase may be considered a triumph of discipline over common sense.<sup>20</sup>

The most impressive feature of the return from BOSTON Mission was the splendid formation in which the first serial of the 316th Group reached Cottesmore at 0400. This achievement, unique in NEPTUNE, indicates that the serial had at no

time been badly scattered. On the other hand, the 313th and 314th Groups returned singly or in dribbles. Also some elements of the 61st Group left their corridor and cut straight across from Normandy to Portland Bill. The last stragglers to reach British soil did so about 0540. Their arrival ended the troop carriers' role in the paratroop missions.

The 507th Parachute Regiment was supposed to hold the northern half of the 82d Division's bridgehead over the Merderet. It was to defend a perimeter curving from the northwest corner of the 508th's territory to a point on the Merderet two miles north of la Fièvre. One battalion was to take the western approaches to the la Fièvre bridge. By a curious combination of circumstances much more than a battalion gathered at that crossing, but on the wrong side, the eastern shore of the river.

Elements of G Company of the 507th under Capt. F. V. Schwartzwalder came down on the east side of the Merderet north of the bridge, moved toward it, and at dawn joined with A Company of the 505th PIR in a fight against Germans in houses near the bridge. Later they were joined by most of the forty-odd sticks of the 507th and 508th which had dropped into the marshes of the Merderet east of DZ T. Many of those troops had headed straight for the railway embankment which was the nearest and most obvious dry ground and had moved southeast along the embankment and across the river to la Fièvre. Others had tried to move down the west bank of the river, were halted by enemy forces of superior strength, and likewise decided on the embankment as the best way to the bridge. First came 130 men under Lindquist, then more than 100 under Gavin, then about 150 collected by Lt. Col. Arthur Maloney and Lt. Col. Edwin J. Ostberg of the 507th. Others followed in smaller groups. By midmorning about 600 paratroops were massed near la Fièvre.

Since this force seemed more than sufficient to take the bridge, Gavin sent 75 paratroops under Maloney to reconnoiter southward and later, on hearing that Chef-du-Pont was undefended, set out with Colonel Ostberg and 75 men to take the bridge there. The east end of the Chef-du-Pont crossing was readily secured, but a few stubborn Germans with some very effective artillery assistance barred the bridge, even though during the

afternoon Ostberg and Maloney employed nearly 250 troops in attempts to cross.

Meanwhile, Colonel Lindquist, left in command at la Fièvre, prepared to force a crossing at that point. One company did not get the order, but the rest cleared the east end of the bridge, and Schwartzwalder dashed across with about 80 men. On the far side they met a patrol sent out by Lt. Col. Charles J. Timmes, commander of the 2d Battalion of the 507th. He had assembled about 50 of his men east of Amfreville near their prescribed zone. Most unfortunately, Captain Schwartzwalder, instead of consolidating his bridgehead, decided that he ought to join Timmes, and did so, leaving only a dozen men behind at the bridge. Before adequate reinforcements could join them, the Germans counterattacked with tank and artillery support, retook the west end of the bridge and soon established themselves there in strength.

In this manner the 82d Division lost its bridgehead west of the Merderet and the paratroops on that side of the river were cut off. Some 300 of them were with Shanley and 120 with Timmes and Schwartzwalder. A larger group gradually concentrated around Col. George V. Millett, Jr., the commander of the 507th PIR. On D-day about 75 men assembled with him near the west end of DZ T. As more converged on that area his force grew until finally he had about 400 men under his command.

Though relatively strong in numbers, Millett's group was without artillery and almost without ammunition. Pinned down among the hedgerows it was unable even to reach Timmes, who was less than a mile away. The Germans, gradually realizing Millett's weakness, pressed him harder and harder, until on the 8th he sent out a series of radio messages declaring that the situation was very critical and that he could hardly hold out another day unaided. Timmes' position, too, was highly precarious, and Shanley, though resisting staunchly, was nearing the end of his resources. The prospect of the paratroops west of the Merderet looked dark indeed.

Certainly part of the responsibility of this situation must rest on the troop carriers. Only about a third of the 507th and 508th PIR's had landed in their assigned operational area. At full strength they would have been more than a match for their principal opponent, the 1057th Grenadier Regi-



ment. Instead, they were outnumbered, scattered, and handicapped by the loss of much of their equipment. Whether the movement of several hundred paratroops along the embankment to the east side of the river was an inevitable result of the inaccurate drop may be doubted. Nor were the results of that move necessarily bad. Since the initial German garrisons at the la Fièrè and Chef-du-Pont bridges were very small, the former might conceivably have been taken before dawn by Schwartzwalder's men and the latter by the paratroops dropped near Hill 30. In that case Company A of the 505th PIR, reinforced by the troops which arrived later from the embankment, would probably have sufficed to defend them. Even as it was, a foothold on the west bank was won by Captain Schwartzwalder and with better coordination might have been held. Although such a bridgehead could not have been exploited immediately, it would have spared the 82d Division the necessity for a bloody assault later to secure a crossing and would thereby have speeded both the relief of the encircled paratroops and the Allied advance across Normandy.

For two days after the D-day battles the situation along the Merderet remained practically unchanged. On 7 June the Germans made fierce but unsuccessful attacks at la Fièrè. Both sides spent the 8th in reorganizing and skirmishing. On the evening of the 8th Ridgway decided to strike across the river and rescue his encircled men. He had available about 850 men of the 508th PIR and perhaps 500 of the 507th, but they were tired, and short of equipment. He therefore picked for his assault fresh troops of the 325th Glider Infantry Regiment, which had arrived by glider on D plus 1.

The 1st Battalion of the 325th crossed the Merderet via the embankment about midnight on 8/9 June, waded along a submerged road through the marshes, turned south after reaching dry ground and attacked toward the la Fièrè bridge, picking up Timmes' force on the way. Half a mile from the bridge they ran into strong opposition and fell back. Millett's group, which had been directed to fight its way east and join Timmes, attempted to do so but broke up in confused fighting north of Amfreville. Millett himself was missing in action, and half his men were captured or killed. The rest filtered north around the flank of the German positions and ultimately reached the

east side of the river, presumably by way of the embankment.

The 3d Battalion of the 325th had been held in reserve.\* On learning that the flank attack had been stopped, General Gavin ordered the battalion to rush the la Fièrè bridge. With the enemy present in strength this was a difficult and hazardous business, since, though the bridge itself was short, it was approached at either end by a long, narrow causeway completely exposed throughout its length. The attack jumped off at 1045 on the 9th after a 15-minute artillery preparation by a few howitzers and medium tanks. The first rush carried most of a company across, although bullets were beating on the bridge like hail. Then some men faltered and a jam developed; a tank sent to hearten the infantry struck a mine and slewed sideways across the causeway; and heavy-weapons men, unable to get through set up machine guns on the road, increasing the congestion. After an hour of strenuous efforts in which Ridgway personally participated, the causeway was made passable, and the rest of the 3d Battalion of the 325th crossed in spasmodic rushes together with a company of the 507th PIR, which had been thrown in to assist them. About noon the heavy weapons platoon and three Sherman tanks got across to provide the infantry with very welcome fire support, and the 3d Battalion of the 508th PIR was committed to take over the southern flank of the bridgehead.

Throughout the afternoon the Americans, greatly hampered by lack of communications, not only with their artillery, tanks and higher headquarters, but even between company and company, advanced slowly through the hedgerows in hard fighting. At 1530 contact was made with Timmes and the 1st Battalion of the 325th. A little later the 3d Battalion of the 508th reached Shanley's positions on Hill 30. By evening the 82d Division held a bridgehead two miles wide extending three-quarters of a mile west of the Merderet to the village of le Motey.

The battle seemed won, but the 1057th Grenadiers, though terribly mauled, were still dangerous. At 1900 they launched a counterattack so savage that it almost broke through to the river. The 1st Battalion of the 325th Glider Infantry was cut off for a time. The regimental commander was evacu-

\*The 2d Battalion of the 325th was assisting the 505th PIR in its attack northward from Ste Mère Eglise.

ated with combat fatigue, and the executive sent word that he did not think he could hold. The rest of the 507th PIR, about 350 men, was hastily thrown into the line, and by 2045 the situation was stabilized. Casualties had been very heavy, the 325th having lost half its strength during the day. Exclusive of the 2d Battalion, it had 60 men dead, 283 seriously wounded, and 246 who were still missing two days later.

At dawn on 10 June two regiments of the 90th Division passed through the bridgehead to relieve the airborne troops holding it and take up the attack westward across the peninsula. The 82d Division, except for the 505th PIR and one glider battalion which were attacking northward toward le Ham in collaboration with the 8th Infantry, was withdrawn to rest and reorganize. The initial phase of its operations was over.<sup>21</sup>

### **Evaluation of the Paratroop Operations**

As D-day drew to a close, the feeling in IX TCC and 9th AF was that the delivery of the paratroops had been an outstanding success. Losses and aborts had been negligible, and mission reports indicated that all serials had done well. On 10 June came the reaction. General Quesada returned from a visit to Normandy with news that the paratroops had been badly scattered and that General Bradley was much disappointed.<sup>22</sup>

To put the matter in perspective, it is well to summarize just what had been accomplished. The troop carriers had undertaken to bring 13,348 paratroops to Normandy. Of these, about 90 were brought back for one reason or another and 18 were in a plane ditched before reaching the Continent. About 100 in ALBANY and perhaps 30 or 40 in BOSTON were killed when the planes carrying them were shot down. The rest jumped. Of the jumpers over 10 percent landed on their drop zones, between 25 and 30 percent landed within a mile of their zone or pathfinder beacon, and between 15 and 20 percent were from 1 to 2 miles away. At least 55 percent of the pilots made drops within 2 miles of their goals. About 25 percent of the troops came down between 2 and 5 miles away from their zones or beacons. With few exceptions these landed east of Pont l'Abbé and north of the Douve, seemingly within

reach of the combat area. About 10 percent were from 5 to 10 miles off the mark, and 4 percent were scattered between 10 and 25 miles from their zones. The remaining 6 percent were unaccounted for.\*

The question arises why, if over 10,000 men were dropped within five miles of their zones, the 101st Division had only about 1,100 troops and the 82d Division about 1,500 troops near their divisional objectives at H-hour (0630) four hours after the end of the drop. Why, too, did the 101st Division have only 2,500 paratroops under divisional control and the 82d Division about 2,000 at midnight of D-day? The matter is important, for if the troops had been able to concentrate on their zones at even the rate of one mile an hour, three-quarters of the force dispatched would have gone into action against its objectives on the morning of D-day and General Bradley would have had slight reason to complain of dispersion.

Colonel Shanley's experiences and those of a multitude of others demonstrate that it often took most of a day to move a single mile in the hedgerow country, particularly if there was the slightest trace of opposition. This circumstance caused drop dispersion to seem much greater than it was and to have more serious consequences than would otherwise have been the case.† The isolation of large bodies of paratroops west of the Merderet and in the vicinity of DZ D accentuated the impression of weakness and dispersion which prevailed in higher headquarters on D plus 2 and D plus 3. Recognition that such groups as those under Shanley and Johnson had received good drops and had done valuable work did not come until later.

On the other hand, it must be said that only six serials in the two paratroop missions achieved anything like compact drops. A map of the other drops looks as though a pepper shaker had been waved three or four times over each zone. Since the zones were all close together and the number of troops was great, these scatterings overlapped, blanketing the battle area. For miles around bands of paratroops attacked outposts and small troop movements and cut communications with paralyz-

\*Many of those were badly dropped, but undoubtedly some well-placed sticks went unreported because of battle losses.

†The 101st Division used the metal snappers known as crickets for recognition and assembly. In the bocage these proved helpful even by daylight. The 82d Division had relied on lights and patrol for assembly and did not have the crickets.

ing effect.\* The Germans even suspected that they were faced with a new tactic of saturation drops.

Such a tactic, however, would be of dubious value, partly because of the vulnerability of scattered troops, and partly because of the need to concentrate decisive numbers at decisive points. The whole history of war shows that a good fighting team can usually beat the best individual fighters, and the effective mopping up of several hundred outlying paratroops in Normandy by quite small German units bears out this rule. The 101st Division reported that it could not have held out in its scattered state for much more than 24 hours without support from the beaches, and it seems doubtful whether even the veteran 82d Division could have lasted 48 hours without such help. If the 505th PIR had not been able to function as a unit close to full strength because of its concentrated drop the plight of the 82d would have been disastrous. The ability of the airborne to clear causeways from the beaches and establish a perimeter of sorts from the sea to the Merderet was derived, not from dispersion but, on the contrary, from the presence of barely enough men in the right place at the right time. If anyone had tried to tell Shettle's men at the le Port bridges or Company A of the 505th at la Fièrre about the advantages of scattering troops the answers would surely have been unprintable.

Having assessed the paratroop missions as better than sometimes supposed, but still only barely successful, the next step is to determine why they fell short of expectations. The evidence indicates that except for slight errors in timing, troop carrier performance was almost flawless until the Normandy coast was reached, and that with one exception most subsequent difficulties may be traced to three factors, clouds, enemy action, and the limitations of navigational aids.

Of these, the cloudbank over the western Cotentin was the most damaging. At least 9 of the 20 main serials had plunged into the clouds and were badly dispersed as a result. All of the six making reasonably compact drops appear to have avoided the cloudbank. Since the clouds were over a thousand feet up and less than a thousand feet in

thickness it would have been easy to go over or under them with a minimum of warning. If only a weather plane had been sent to test conditions, if only radio silence rules had not prohibited one serial from warning those that followed, troop carrier performance would have been immensely improved. Masses of low clouds were known to be over Normandy on three June nights out of four, and it must be rated as a serious planning error that no safeguard against their presence was made.

Enemy fire had considerable effect, but it had been minimized as far as could reasonably be expected. Thanks to excellent intelligence, planes staying on course encountered very little flak. Thanks to effective tactical surprise and the protection of the cloud bank, fire of any sort was slight until the planes were within five miles of the drop zones. Even then it was wild and ineffective, causing losses of under 2½ percent. Although the pilots had been warned against evasive action many of them did indulge in it. After all, about a fifth of them had had only a minimum of training and three-quarters of them had never been under fire before. Later, in MARKET and VARSITY, they were to do better in this respect under much greater hazards. It should be remembered to their credit that all but two stuck to their task and dropped their troops, many making repeated passes under fire in attempts to correct errors. Another adverse effect of ground fire was to interfere with navigation by distracting attention and concealing signals. A pilot whose plane was tossed about by a bursting shell might be a mile off course before he knew it. Light signals from formation leaders or from pathfinder troops on the ground could be hidden in a welter of flares, tracers and smoke.

The pilots were forced to rely heavily on radar because for most of their way across Normandy the clouds rendered visual navigation nearly impossible. In NEPTUNE radar proved to be a much less effective guide than radar enthusiasts had supposed. It did guide planes to the general vicinity of their zones, but it could not be relied on to produce an accurate drop.

As already noted, SCR-717 was of little value in locating inland objectives. Gee was successful enough to rouse uncritical enthusiasm, but its margin of error in Normandy averaged about a mile.<sup>23</sup> Miscalculations or faulty adjustment could cause a three-mile error like that of the lead serial of the 438th Group. Although it had a bad repu-

\*Most notable of their exploits was that of six paratroops of the 508th PIR who ambushed and killed Generalleutnant Wilhelm Falley, commander of the 91st Division, just as he was setting out by car at 0600 on D-day from his headquarters near Picauville. (James M. Gavin, *Airborne Warfare* (Washington, 1947), p. 65; statement by POW Baumann, 11 Jun 44, in 82d Abn Div, G-2 File in Microfilm Box 2007, Item 2029.)

tation for breakdowns and vulnerability to jamming, Gee was 98 percent serviceable and almost unaffected by jamming in NEPTUNE. However, since only the pathfinders and one or two planes in each serial were equipped with Gee, it was of no help to the multitude of pilots whose formations had broken up.

Rebecca-Eureka, prescribed as the primary aid to be employed in approaching the drop zones, was so used in a majority of cases. Responses from the Eureka's on the zones were picked up clearly at an average distance of 16 miles, except at DZ A and DZ N. In the former case the beacon was turned on too late for the first one or two serials, and in the latter, either because of jamming or because of malfunction, the reception was unsatisfactory. Had some beacons and some Rebecca sets been turned on sooner the average reception distance might have increased to about 20 miles. The average range of the Eureka's in England and on the marker boats was 22 miles, but in part this was achieved because the missions flew higher over England than during their approach to Normandy. As anticipated, precision dropping with Rebecca proved very difficult because the blips representing plane and beacon merged well before the plane reached its zone. This may have been the main reason why so many of the pilots came within 2 miles of their zones, but were unable to hit them.

Another weakness of Rebecca-Eureka was that, when many beacons were used in a small area, a Rebecca was likely to trigger the wrong beacon and receive its responses. Available channels were too few and too close together, and the sets were insufficiently selective to prevent such reception. Many pilots in NEPTUNE are known to have picked up the wrong beacon, and there is circumstantial evidence that others made drops on the wrong beacon, despite the fact that each had its own distinctive coding.

Most serious of all was the liability of Rebecca-Eureka to saturation if more than about 40 sets were in use at once. For this reason its use had been limited to flight leaders except in case of emergency. Although used by an estimated 150 stragglers, and by as many as 30 of them at one time on one beacon, the Rebecca system did not become saturated. What did happen was that at least 150 pilots who needed to use it did not do so. In this category may be placed most of those who dropped their loads more than five miles from their

zones. With few exceptions pilots making such drops had become separated from their flight-leaders. We may surmise that most of them had lost track of their position either because of evasive action or because they had overshot and had to make an additional pass. Once disoriented, it was fatally easy for them to make a wrong guess as to where they were and proceed to the wrong destination, or, like the St. Jores group, to fall in behind others who were doing so. Cautious pilots used Rebecca and succeeded. Confident or overconscientious pilots hesitated to use it and went astray. Since the sets were 97 percent serviceable and had sufficient range to cover most of the Cotentin, almost every one of these wanderers could have reached the drop area by using them. The error lay in the wording of the field orders which should have enjoined all individual stragglers and all leaders of straggling elements to make use of Rebecca, as soon as they became separated from their flight.\* Admittedly this would have involved some risk of saturation, but the alternative course denied radar guidance to those who needed it most.

Another handicap which fell especially on the inexperienced pilots who lost contact with their formations was that only two planes in five carried navigators. This number, all that the tables of organization permitted, was ample for formation flying by daylight, but stragglers on a difficult flight over enemy territory at night would have benefitted by having trained men to compute their positions.

One major episode, the bad drop made by the second serial of the 436th Group, is difficult to explain in the above terms. The three or four mile deviation of the lead elements might possibly have resulted from radar misuse or malfunction, but how a majority of the serial, could have dropped north of Montebourg is an enigma.

If all had gone according to plan, formations guided by Gee or Rebecca to the vicinity of their zones would have seen lighted T's showing them exactly where to drop. However, on four zones out of six enemy action or the nearness of enemy troops prevented display of anything but an occasional surreptitious light. At a fifth zone, DZ A, the T was put out too late for two serials, one probably never came in sight of it, and the other

\*It is significant that field orders for airborne missions after NEPTUNE were worded to this effect.

one slated to use it was scattered. On DZ O where T's were put out as planned the best drops in either ALBANY or BOSTON were achieved, and they were the best precisely because of corrections made after the T's were sighted. Since of all the other serials only two or three made even comparably good drops, the case for use of lighted T's seems strong, if not conclusive.

The difficulties encountered in NEPTUNE once again raised the question of whether night paratroop operations were worth while. Given the vulnerability of lighted beacons, the limitations of radar, and the difficulty of keeping formation at night, the advantage of being able to see one's way might more than balance the hazards of ground fire and air interception incurred by daytime missions—provided the enemy were not too strong. So General Williams decided prior to DRAGOON, and so General Brereton decided before MARKET and VARSITY. Never again in World War II did any considerable number of Allied paratroops make a night drop.

### **CHICAGO and DETROIT—The Initial Glider Missions**

For reasons already noted the follow-up missions in NEPTUNE were comparatively small. They played only a minor part in the operations of the 101st Division because of its quick link-up with the seaborne forces. They were of real but limited assistance to the 82d Division. Their greatest value lay in the experience they provided in the little-known fields of aerial reinforcement and re-supply.

The first reinforcements, consisting principally of artillery, were to be delivered by two glider missions, CHICAGO and DETROIT, about dawn on D-day. Late in May the time of the two missions had been changed from civil twilight to before daybreak to give the glider men greater safety from ground fire. Release time for CHICAGO was to be 0400 and that for DETROIT 0407. In vain did both the troop carrier and airborne commanders protest to Leigh-Mallory that they were once more being committed to night landings and that such landings on the small fields of the Cotentin might cost half the force in crashes alone.\* Fear of German guns outweighed their objections

\*It will be recalled that the glider training program of IX TCC had not included tactical landings at night.

and the decision stood. However, as a concession, about two days before D-day IX TCC was authorized to use Waco gliders exclusively in those two missions in place of the heavier, less maneuverable and less familiar Horsas. The change entailed a hasty revision of loading plans and a substantial reduction in the amount carried. Since the two serials were to approach under cover of darkness, they could safely follow the same routes as the paratroops. CHICAGO, which was in support of the 101st Division, would follow the course of ALBANY, and DETROIT, which was to serve the 82d Airborne, would follow the path of BOSTON.<sup>24</sup>

CHICAGO began at 0119 when 52 planes of the 434th Group, each towing a Waco, began their take-off from Aldermaston. Occupying 44 of the gliders were Batteries A and B of the 81st Airborne AA Battalion. Aboard the others were medics, engineers, signal men, and a few staff personnel, including Brig. Gen. Don F. Pratt,\* assistant commander of the 101st Division. In all, the serial carried 155 airborne troops. The cargo consisted of sixteen 57-mm (6-pounder) antitank guns, 25 vehicles, including a small bulldozer for the engineers, 2½ tons of ammunition and 11 tons of miscellaneous equipment.

The destination was LZ E, a roughly triangular area overlapping the west side of DZ C. Its northern side, a mile long, ran beside the road which connected Ste Marie-du-Mont and les Forges. Its western boundary was about 1½ miles long. The slightly concave hypotenuse passed through the village of Hiesville, two miles west of Ste Marie. Like the rest of that region, the LZ was flat and divided into fields, of which most of those on the zone were between 300 and 400 yards long. Outside the zone the average field was considerably shorter, many being only 200 yards in length. Early intelligence reports had described the fields as bordered by trees averaging 40 feet in height. These trees had not shown up well on reconnaissance photographs, and their presence received little or no mention in the briefings of the glider pilots, who assumed that the borders were merely large hedges.

The 434th made a good take-off, and with bright moonlight to assist it readily assembled

\*Pratt's inclusion in the glider mission was an afterthought. He had originally been designated to command the seaborne echelon of the division.



*Figure 5. Waco Gliders Landing in Normandy.*

into columns of four in echelon to the right. Shortly thereafter a glider broke loose and landed four miles from the base. In it was a SCR-499 radio by which the 101st Division was to have communicated with higher headquarters. The equipment was retrieved and sent that evening in KEOKUK Mission, but together with the loss of communications personnel and equipment in ALBANY this accident prevented the Division from communicating with the outside world until after noon on D-day.

The rest of the serial reached Normandy without incident, but encountered sporadic fire, mostly from small arms, while crossing the peninsula. The enemy shot down one plane and glider near Pont l'Abbé and inflicted minor damage on seven planes. Some slight damage was also done to the gliders. The weather over the Cotentin was cloudy but not enough so to cause dispersion. Only one pilot straggled out of formation. He released his glider south of Carentan, about eight miles from the LZ. The other 49 pilots reached the release area, split into two columns as prescribed to avoid congestion during the landings, and released their gliders from an altitude of 450 feet at 0354, six

minutes ahead of schedule. They had been guided for the last 20 miles by a Eureka set up by the pathfinders and could see the green lights of the T flashing beneath them. After releasing they headed out over the St. Marcouf islands. All arrived safely at Aldermaston soon after 0530.

Their portion of the operation had been successful, but the glider pilots ran into difficulties. They swept into the prescribed 270 degree left turn and in the process most of them apparently lost sight of the T. Without it in the dim light of a setting moon obscured by clouds they could not recognize their landing zone. Only 6 landed on the zone and 15 within about half a mile of it. Ten were neatly concentrated near les Forges, west of LZ E, and the other 18 scattered east and southeast of the zone, all but one landing within two miles of it.

Most of the gliders made crash landings. This was to be expected. The Waco was capable of clearing the highest trees around the zones and landing within 300 yards, but in doing so there was almost no margin for error. Pilots attempting the feat in semi-darkness were likely to overshoot and ram into a tree or ditch at the far end of the field. The unexpectedness of the obstacles greatly



Figure 6. Remnants of Gliders in a Normandy Hedgerow.

increased the hazard. On smaller fields outside the zone a crash was inevitable, and the T had been misplaced somewhat west of its proper location, causing some glider pilots to mistake their position and land on unsuitable fields.

Nevertheless the landings were successful. Darkness minimized the amount of effectiveness of enemy fire, and all but a handful of glider pilots managed to bring their craft to a stop without harming the passengers and contents, even though the gliders themselves were mostly crumpled beyond repair. Five of the airborne, including General Pratt, were killed, 17 were injured, and 7 were missing.

It took time to pry equipment out of smashed gliders, and more time to assemble, with occasional interruptions by rifle fire or mortar shells. A detachment sent out at dawn by the 101st Division to meet the mission at the LZ and guide the reinforcements to Hiesville did not return until noon, but when it came back it brought with it 3 jeeps, 6 antitank guns, 115 glider troops, and 35 prisoners to boot. Because of the bad drop of the 377th FA Battalion, the division had for artillery only one 75-mm. pack howitzer on the northern perimeter near Foucarville and one captured German gun at the 506th's Culoville CP, so the gliderborne antitank guns were particularly welcome. On D plus 1 and D plus 2, they provided valuable support for Colonel Sink's thrusts southward against the Germans at St. Côme-du-Mont. CHICAGO Mission had succeeded beyond expectation.<sup>25</sup>

The 82d Division's initial glider mission, DETROIT, was flown from Ramsbury by the 437th Group. It was to follow 10 minutes after CHICAGO. The same Eureka beacon and T of green lights which had been provided for the paratroop drop on that zone would be used as aids for the gliders. The serial was made up of 52 C-47's and 52 Wacos. It carried Batteries A and B of the 80th Airborne Antiaircraft Battalion, part of the divisional staff, and a signal detachment, 220 troops in all. Its cargo was 22 jeeps, 5 trailers, sixteen 57-mm antitank guns, and 10 tons of other equipment and supplies.

The 437th Group began taking off at 0159 and had its serial in the air by 0223 with the exception of one plane which lost its glider, returned for a substitute, and delivered it to the LZ about half an hour behind the rest. The weather over England

and the Channel was reported as favorable with visibility over 10 miles at most points. The Eureka's at the checkpoints were picked up at 10 to 12 miles distance, and the lights at GALLUP and HOBOKEN were visible from afar. Unaffected by distant fire from Alderney and Guernsey, the formation reached PEORIA intact. Then, like so many of its predecessors in the paratroop missions, it ran into the cloudbank, which at that time and place extended from an altitude of about 800 feet to approximately 1,400 feet.

The leader and many others climbed to 1,500 feet, went over the clouds, and let down two or three minutes later through breaks in the overcast. They emerged somewhat scattered and slightly north of course. However, a substantial portion of the serial plunged into the clouds and found itself in such dense obscurity that the glider pilots could not see their own tow planes. Inevitably that part of the formation broke up, although most of the pilots remained approximately on course.

While in the cloudbank seven gliders broke loose, were released, or were cut loose by enemy fire. Two were later located in western Normandy, but the rest were still unaccounted for a month later. Further inland the clouds became thinner and more broken, but visibility was still bad enough to cause the premature release of seven more gliders on the west side of the Merderet. It appears that one or two pilots, catching a glimpse of the flooded valley ahead of them, mistook it for the sea and hastily gave the signal for release. Others behind them saw their gliders descending, assumed the zone had been reached, and likewise released their gliders.

Once out of the clouds, the serial was harassed by small-arms and machine-gun fire. One plane was lost, 13 received enough damage to ground them temporarily on their return, and 25 more were decorated with bullet and shell holes. The gliders, too, incurred some damage and the troops suffered a number of casualties.

About 37 pilots surmounted all difficulties and reached the vicinity of the LZ between 0401 and 0410. The Eureka on LZ O was functioning and had been picked up by the leaders at a distance of 15 miles. The T was not in operation, and certain glider pilots who reported seeing a green T south of Ste Mère Eglise had probably sighted the one on LZ E.



Loose and disorganized as the serial was, part of it did make a concerted release in two columns with the left-hand column some 200 yards north of the LZ and the right-hand one heading over the center of the zone at altitudes between 400 and 500 feet. Most of the stragglers released in that general area and at roughly the same altitude. After releasing, all planes dived down to about 100 feet, skimmed out over the coast through a spatter of small-arms fire, and headed home. The first reached the runway at Ramsbury at 0522, and the last straggler was back by 0610.

While the descent of the gliders in DETROIT was marked by no such confusion as had marred the big glider mission to Sicily, it was certainly not according to plan. Instead of spiralling smoothly into their appointed fields, the gliders came down by ones and by twos with each pilot following the pattern that seemed best to him. Several were under fire on their way down, and one glider pilot claimed to have been attacked by an enemy fighter (probably another glider), but the main difficulty was the inability of glider pilots to identify their proper fields or, in some cases, to orient themselves at all. The railway and the town of Ste Mère Eglise seem to have been the only landmarks that most could recognize in the dim light. Nevertheless, between 17 and 23 managed to land on or near LZ O.\* The best concentration among these was achieved by 5 pilots of the 84th Troop Carrier Squadron who landed their Wacos in adjoining fields at the western end of the LZ. Nine other gliders, including 2 which crash-landed in Ste Mère Eglise, were within two miles of the zone. Three, which came down near Hiesville, may have followed aids set out on LZ E for CHICAGO.

As in CHICAGO safe landings were the exception rather than the rule. Some 22 of the gliders were destroyed, and all but about a dozen were badly smashed. Again the principal cause of crashes was the smallness of the fields and the height of the trees surrounding them, but other hazards such as swamps, and the rows of posts known as "Rommel's asparagus," accounted for nearly half the crack-ups. One glider ran into a herd of cattle. The rough landings produced fewer casualties than might have been expected. Only three of the airborne troops were killed and 23

injured. Several jeeps broke loose and 11 of them were unusable. The guns were more durable. Of 8 landed within two miles of the zone all remained intact.

One effect of the dispersion of the paratroops was to provide friendly reception committees on the spot for most of the gliders even in cases where they missed the zone by a considerable distance. Overjoyed to get artillery, these men were of great assistance in unloading. They blasted down a wall to get one gun out of an orchard in St Mère Eglise and ripped another out of a Waco which had wrapped itself around a tree. By noon four of the guns were in action at la Fièvre and two or three others on the outskirts of Ste Mère Eglise. Though hardly more than 50 percent effective, the mission had given the airborne troops some badly needed firepower.<sup>26</sup>

### **KEOKUK and ELMIRA Glider Missions**

Between dawn and early evening on D-day the troop carriers undertook no further operations, but about 2100, two hours before sunset two more glider missions, KEOKUK and ELMIRA, arrived over Normandy. As already noted, these and subsequent missions were heavily escorted and minimized their exposure to German anti-aircraft by approaching their objectives from the east coast over the UTAH beachhead.

KEOKUK was flown from Aldermaston for the 101st Division by 32 planes of the 434th Group, each towing a Horsa. The big gliders carried 157\* signal, medical, and staff personnel, 40 vehicles, 6 guns, and about 19 tons of other equipment and supplies. Release was to be made at 2100 hours over LZ E. At 1830 the first tug and glider took off on what proved to be an incredibly easy mission as far as the aircraft crews were concerned. With good weather and daylight all the way everyone kept on course and in formation. No enemy aircraft were encountered and virtually no ground fire. Battle damage consisted of a few nicks in one plane. A detachment of glider pilots had been busy clearing the drop zone and cutting down trees, and the pathfinders had marked it with a yellow panel T and green smoke.

The serial, like most of its predecessors, arrived

\*Interrogations of the glider pilots indicate that 23 were in the vicinity, but some of them are very vague as to their exact location.

\*Given as 165 in Leonard Rapport and Arthur Northwood, Jr., *Rendezvous With Destiny* (Washington, 1948), p. 133.

ahead of schedule, and the gliders were released at 2053. The pilots then circled and returned as they had come over the St. Marcouf islands, and GALLUP. They reached Aldermaston at 2228.

The glider pilots had a harder time than the plane crews. The Germans still had considerable forces around Turqueville, two miles north of LZ E, and St. Côme, two miles south of the zone, and had not been entirely cleared from the area between. After holding fire as the planes passed over, the enemy concentrated it on the descending gliders but were not near enough to do much harm. Operating in daylight, most of the glider pilots were able to land the Horsas with no more than moderate damage, a fact worth noting in view of what was to happen later in ELMIRA Mission.\* However, bullets and accidents combined to kill 14 troops and cause 30 other casualties. Ten of the airborne were missing. They had been in two gliders which landed within the German lines near les Droueries.

The distribution of the landings indicates that most of the serial had released its gliders at least a mile short of the proper point. Fourteen gliders were concentrated in a few fields about 2½ miles northeast of LZ E; five were at points several hundred yards further east; eight were scattered southeast of the zone at distances up to two miles from it; and only five landed on the LZ itself.

KEOKUK was helpful rather than essential to the operations of the 101st Division. However, it is important as the Allies' first tactical glider operation in daylight. It indicated that gliders, when not exposed to fire at close range, could be landed in daytime without excessive losses.<sup>27</sup>

ELMIRA, the other glider mission on the evening of D-day was to reinforce the 82d Division. In order to limit the glider columns to a defensible length and to reduce congestion during the glider landings it was split into two echelons. One, towing 76 gliders, was to be 10 minutes behind KEOKUK, the other, towing 100 gliders, would go two hours later.

The goal of the mission was LZ W, an oval about 2,800 yards long from north to south and over 2,000 yards wide on terrain much like that of LZ E. The northern tip of the oval was about a mile south of Ste Mère Eglise, and the highway from that town to Carentan ran through the middle of the zone. About 1,000 yards inside the south-

ern end of the LZ, the highway was intersected at les Forges by the east-west road from Ste Marie-du-Mont.

The first echelon contained two serials, one of 26 planes of the 437th Group, towing 8 Wacos and 18 Horsas, and a second of 50 from the 438th Group with 14 Wacos and 36 Horsas. The Wacos were segregated in separate flights to reduce the problem of flying two types of glider in one formation. Within the gliders of the first echelon were Battery C of the 80th Airborne AA Battalion, contingents of medics, signal men and divisional headquarters personnel, a reconnaissance platoon and an air support party—437 men in all. The cargo comprised 64 vehicles, mostly jeeps, 13 antitank guns (57-mm.), and 24½ tons of other supplies and equipment.

The 437th took off from Ramsbury between 1907 and 1921, and the 438th from Greenham Common between 1848 and 1916. Climbing with the heavily laden Horsas was a slow business, but all planes succeeded in assembling and setting out in formation. Over England squally weather made the gliders hard to handle; they veered and pitched on their long ropes. From then on the weather was excellent with unlimited visibility and scattered clouds overhead at 3,000 feet. At Portland Bill the escort appeared. The sky seemed full of P-47's, P-51's and P-38's, an impressive array. Besides "delousing" patrols ahead of the column, fighters were flying close cover on both sides and high cover at between 3,000 and 5,000 feet. No German planes appeared to challenge them, and the columns flew in serenely over UTAH Beach.

Not until the release point was almost reached did ground fire begin. This rapidly increased in intensity and did considerable damage. The volume of fire was moderate, the period of exposure was short, and the weapons employed were small arms and machine guns with a little 20-mm. flak, but the shooting was unpleasantly accurate. Enemy troops were close to the line of flight, and the mission had neither surprise nor darkness to protect it. Two aircraft were shot down after releasing their gliders, but only two or three injuries resulted. One of the two planes, its engines dead, dived between two trees, stripping off both wings and engines, yet skidded safely to rest. Some 37 aircraft returned to England with slight or moderate damage. Two had dead engines, one had 65 bullet holes, and one limped in with the crew

\*See below, pp. 67-68.

chief holding its shattered feed lines together. Three men had been slightly wounded.

LZ W, a short six miles from the coast, should have been easy to locate. The landscape was still plainly visible, and some pilots saw a panel T and green smoke, near which a Eureka beacon was sending out signals, clearly received on the Rebecca sets in the planes. However, because of an emergency as yet unknown to IX TCC, the T, smoke and radar were not on LZ W but two miles northwest of it. A potential source of further confusion was the presence of the panel T and green smoke set out for KEOKUK in the vicinity of LZ E, which was two miles east of les Forges.

Guided by Gee and by visual identification of the terrain, the leader of the 437th Group headed straight for LZ W and released his glider there at 2104, followed, it appears, by almost all his serial. Ten minutes later planes of the 438th Group appeared over the zone and made their release, but, part of the serial had erroneously loosed their gliders over LZ E. Release altitudes were generally between 500 and 750 feet. From such heights a Waco could glide more than two miles, a Horsa less than a mile. After releasing their gliders, the troop carrier pilots swung their planes into a 180 degree left turn, thereby exposing themselves to fire from the Germans around St. Côme-du-Mont, and headed out over UTAH Beach. They were back at their bases within two hours.

No one who knew the situation on LZ W at that moment would have recommended landing gliders on it. The wedge of German resistance between Turqueville and Carquebut extended across the northern part of the zone and isolated it from the territory taken by the 505th Parachute Regiment. The paratroops around Ste Mère Eglise could not get through the belt of German territory to reconnoiter LZ W, let alone to set up beacons there, and until late in the day General Ridgway had every reason to believe that the entire zone was in German hands. Hence he had decided to place the beacons and markers in the vicinity of LZ O. He had attempted to get word of the situation to IX TCC, first by radio and later by panels laid out for a reconnaissance plane, but the message was not received, and the panels were not observed.

During the afternoon of the 6th two battalions of the 8th Infantry Regiment had driven the enemy from the southern portion of LZ W, and small

seaborne elements of the 82d Division under Col. Edson D. Raff made two unsuccessful attempts later to push the Nazis from the rest of the zone. However, when the gliders arrived the Germans still held approximately the northern quarter of the LZ. From their lines southward almost to les Forges the zone was a no-man's land, full of snipers, traversed by German patrols, and under observed fire from mortars and an 88-mm. gun on high ground near Fauville. Raff's men did their best to steer the gliders to safety by waving yellow flags and making an F of orange smoke, but the glider pilots either did not see them or did not know what to make of the unexpected signals.\*

As a final hazard, landings had to be made in the face of obstacles greater than those on the other zones. Not only were there "postage stamp" fields 200 yards long, bordered by 50-foot trees, but also some of the designated fields turned out to be flooded and others were studded with poles more than 5 inches thick and 10 feet or more in height. Trip-wires for mines had been attached to many of the poles but fortunately, the mines themselves had not been installed.

A fairly typical landing was that of the Horsa carrying Capt. William W. Bates of the 53d Wing. Unable to reach a large field, the pilot picked a small one, lowered his flaps, and landed at about 70 miles an hour. The glider bounced twice and when about 10 feet off the ground on its second bounce crashed through a row of trees which stripped it of its wings and landing gear. The craft scraped to a stop 10 yards behind Raff's forward positions. There were plenty of bullet holes in the tail, but the only casualty was a soldier who suffered a broken leg as a result of leaving his safety belt unbuckled during the landing. The cargo, an ammunition trailer, was intact and was unloaded in 20 minutes. The episode illustrates the surprising degree to which the passengers and cargoes of the gliders survived crash landings.

All things considered, the glider pilots did fairly well under difficult circumstances. Only two gliders in the first serial landed on LZ W, but 12 came within a mile and all but one or two were within two miles of it. In the second serial all but one of the 14 Wacos, flown by the 88th Troop Carrier Squadron, landed on or very near the zone, 9

\*Orange smoke and yellow panels were supposed to indicate friendly troops, but there was no plan to have them mark landing zones.

Horsas hit the zone, and 6 came within a mile of it. On the other hand, a dozen Horsas in that serial landed near LZ E, and 4 Horsas missed the zone by about three miles. Few, if any, followed the pathfinder aids to LZ O, and the 82d Division therefore considered the release inaccurate.

Thanks to greater durability and their longer gliding range the Wacos made a much better safety record than the Horsas. Over half of them landed intact, while only about 20 percent of the Horsas were undamaged. Three Wacos and 21 Horsas were destroyed, but much of the destruction was caused by enemy action. Particularly in the case of landings north of les Forges, the lives of the men often depended on their jumping out of the glider and into the nearest ditch before the Germans could bring artillery, mortars or machine guns to bear on them. Unloading had to wait until nightfall or until it was clear the glider was not being used as a target. However, within a few hours most of the men and materiel which had landed in friendly territory on or near the LZ had been brought to Colonel Raff's command post on the north side of les Forges. Of the glider pilots 5 had been killed, 4 were missing and 17 had been wounded or injured. The airborne had five killed and 18 injured or wounded. None of them were missing for long.<sup>28</sup>

The second echelon of ELMIRA contained one 50-plane serial from the 436th Group at Membury with two Wacos and 48 Horsas, and another from the 435th Group at Welford with 12 Wacos and 38 Horsas. With them went a paratroop plane of the 435th which had failed to drop its troops on the previous night. The great capacity of the Horsas, one of which could carry a 75-mm howitzer, a jeep and five men, enabled these serials to carry much more than those in the morning missions. The first serial carried the 319th Field Artillery Battalion and a few other artillerymen, medics and engineers, a total of 418 airborne troops. As cargo it had 31 jeeps, twelve 75-mm. howitzers, 26 tons of ammunition and 25 tons of other equipment. The second serial was occupied exclusively by the 320th Field Artillery Battalion with 319 troops, twelve 105-mm. howitzers, 28 jeeps, 33 tons of ammunition and 23 tons of other equipment.\*

The troop carriers set out still unaware that the

82d Division was marking LZ O instead of LZ W. They did receive a last-minute phone call from the 53d Wing directing them to make a 180 degree right turn after releasing their gliders instead of the left turn prescribed in their orders. Presumably IX TCC had learned that the Germans still held the St. Côme area in strength.

The lead plane of the 436th took off at 2037 and that of the 435th about 2040. As the 435th circled upward to form its column of fours, one Horsa broke loose, and one plane turned back with its generators burned out. Both loads were towed in next morning with the 437th Group as part of GALVESTON mission. The trip to the east coast of Normandy was uneventful. The weather was favorable and the fighter cover lavish, but, presumably because of the impending darkness, the escort turned back at the St. Marcouf islands.

The sun set a few minutes before the serials reached UTAH Beach, and as they passed over Normandy the landscape lay in deepening shadow. The pathfinder troops on LZ E had long since ceased operations. Undistracted by landmarks or rival beacons, the second installment of ELMIRA headed for the Eureka and the visual aids set up by the 82d Division in the vicinity of LZ O.

To their surprise, about three miles inland the serials ran into fire bad enough to make the 435th's paratroop operation seem like a milk run. The fire grew more intense as they approached the LZ, and continued during their 180 degree turn to the right and, in some cases at least, all the way back to the coast. The explanation is simple when one realizes that a course from UTAH to LZ O would pass over or just north of the German positions at Turqueville, that the LZ area was within range of German forces north of Ste Mère Eglise, and that a right turn after release would bring the planes directly over those forces. A wide turn or a slight deviation to the north would put a pilot over German-held territory clear to the beaches. German marksmanship was also aided by the American flame-dampeners which became white hot and shone brightly in the semidarkness.

The barrage was less deadly than it appeared. The harm it caused aboard the planes was proportionately about the same as that inflicted on the previous echelon. In the first serial 33 aircraft received some slight damage, and two troop carrier men were wounded. In the other, three aircraft had to be ditched on the way back because of

\*According to the report of the 82d Division, the 12 Waco gliders in that serial each carried a 105-mm. howitzer.

hits on engines or fuel systems. All personnel aboard them were rescued. Two planes had to make emergency landings in England, and 20 more were damaged but readily repairable. One member of the 435th Group was killed and one wounded. Both groups scattered and returned in dribbles, some arriving as late as 0300 next morning.

The initial glider release in this part of ELMIRA occurred at 2255, five minutes ahead of schedule. The second serial loosed its first glider at 2305. Most of the lead serial released their gliders over a mile short of LZ O, and six gliders were released at least five miles east of the zone.\* The main body of the second serial was quite accurate, but five of its pilots went to LZ W by mistake. Either they were not using Rebecca or they trusted their briefing more than the beacon.

Once again small fields and enemy fire played havoc with the glider landings. The fire in some places was intense, and many men were killed or wounded in the one or two minutes before their gliders reached the ground. Some pilots, despite strict orders for a slow landing, slammed their Horsas into the landing fields at 100 miles an hour. Since the fields were short, some being only 100 yards long, and since the twilight made a precise approach over the hedgerows increasingly difficult, even the most careful pilots were lucky to escape a crash.

Counting some damage done after landing by enemy fire, only 13 of 84 Horsas were left intact, and 56 of them were totally destroyed. There was a widespread feeling among the glider pilots that the Wacos, with their gentler glide and tougher frames would have done better, but none of the 14 Wacos which were sent survived intact and 8 of them were destroyed. Of 196 glider pilots 10 were killed, 29 or more were wounded or injured, and 7 were still missing at the end of the month. The airborne had 28 killed and 106 wounded or injured, but hardly any were missing for more than two days.

Once again the occupants of most of the gliders had to take cover immediately after landing, and unloading was postponed until after dark. The cargoes had come through surprisingly well. The 435th Group estimated that 39 of its 48 loads

were usable, and this is confirmed by estimates from glider units that 42 out of 59 jeeps, 28 out of 39 trailers and 15 out of 24 howitzers were serviceable. However, much of the materiel could not be collected or used immediately.\*<sup>29</sup>

The focal point of the landings of the gliders in the first serial was almost two miles northeast of LZ O. This put them near to and in some cases within the German positions. A member of the divisional artillery staff, who had come with the serial, gathered about 200 men of the 319th and led them during the night into the lines of the 4th Division east of Ste Mère Eglise. Other groups made their way back with more or less difficulty, and at 1715 on 8 June the 319th Field Artillery went into action near Chef-du-Pont with almost all its men and 6 of its howitzers.

In the second serial, carrying the 320th Field Artillery, all gliders but the five released near LZ W and one or two released a few seconds too soon northeast of Ste Mère Eglise landed within a mile of LZ O. Maj. Robert M. Silvey of the 320th, who had landed in DETROIT Mission that morning, was waiting beside the pathfinders on the zone and soon gathered slightly less than half the battalion with two usable howitzers. These began firing at 0930 on the 7th from positions 400 yards west of Ste Mère Eglise. Thereafter patrols brought in a steady stream of troops and materiel from outlying gliders, and by evening of 8 June the battalion had eight of its howitzers in action, including two landed in the vicinity of LZ W, and had accounted for practically all of its personnel.<sup>30</sup>

### **Glider Missions on D plus 1 — GALVESTON and HACKENSACK**

Reports of the hazards and confusion which plagued ELMIRA prompted the 53d Wing to make certain changes in GALVESTON, the first glider mission scheduled for D plus 1. Landfall was to be made four miles south of UTAH Beach on the north side of the Douve estuary. Instead of using LZ W the pilots were to release their gliders in the vicinity of LZ E about a mile west of Ste Marie-du-Mont, and their homeward turn after release would be made to the left, instead of the right. These changes would keep the serials out of

\*Some sanction to these premature releases was provided by the field orders, which prescribed release short of the zone but within gliding range of it to minimize exposure of aircraft to enemy fire.

\*There are substantial differences between the two chief sources for these figures. (Hq 82d Abn Div, Action in Normandy, Annex 5; Table on Landings of the 320th GI FA Bn, in Box 2029 AGO microfilm, Item 2101.)

range of the enemy north of Ste Mère Eglise and in the Turqueville enclave.

GALVESTON was designed to reinforce the 82d Division with guns, vehicles and glider infantry. Its first serial, flown by the 437th Group from Ramsbury, consisted of 50 planes towing 32 Wacos and 18 Horsas. In the gliders were the 1st Battalion of the 325th Glider Infantry, and part of an engineer company, a total of 717 troops with 17 vehicles, 9 pieces of artillery and 20 tons of equipment. The second serial was made up of 50 planes and 50 Wacos, flown by the 434th Group from Aldermaston. Aboard were the headquarters of the 325th Glider Infantry, the Reconnaissance Platoon of the 82d Division and sundry engineers and artillerymen, in all, 251 men with 24 vehicles, 11 guns, 5 tons of ammunition and 1½ tons of other materiel. With the mission went two planes of the 435th Group towing Horsas which had aborted in ELMIRA.

Take-offs at the two fields began at 0439 and 0432 respectively, more than half an hour before dawn, in conditions of poor visibility, rain, and gusty wind. One Horsa of the 437th with a 1000-pound overload wouldn't budge off the ground. Another was accidentally released during assembly, but its tug plane returned and picked up a substitute. One glider of the 434th Group likewise was released over the field and was replaced by a substitute. Another broke loose near Portland Bill, too far away to transfer its load.

Over the Channel and over Normandy the weather improved. The rain gave way to thin, high, broken clouds and the visibility became excellent. The mission followed the beacons to GALLUP, turned there and proceeded by pilotage and dead reckoning to the St. Marcouf Islands, and the mouth of the Douve. Since the sun was up and the Normandy coast plainly visible most of the way after GALLUP, navigation was not difficult. The serials passed over or near many Allied ships, but by daylight the glider formations and their identifying stripes were recognized in all cases. Some of the gliders, sluggish because of overloads, were hard to manage, and some formations became scrambled. One glider pilot reported seeing C-47's above and beneath him as he approached Normandy.

Between the coast and the LZ both serials reported small arms fire of medium intensity, probably from German elements pushed south from

the UTAH area on the previous day and not yet mopped up. The 437th was also fired on after its turn, which probably brought it over the German salient around St. Côte. In the 437th's serial 8 planes received moderate damage and 18 in the 434th were hit, none of them seriously.

The 437th Group arrived at 0655, five minutes ahead of schedule. Its serial came in low and released most of its gliders from between 200 and 300 feet and a few of them even lower. Release at such altitudes meant that the gliders could not glide much more than half a mile or stay in the air over half a minute. It decreased exposure to enemy fire but increased the chance of accidents. All but five or six of the gliders were released too soon and landed between the two southern causeways and LZ E, the greatest concentration being a mile northeast of Ste Marie-du-Mont.

The gliders landing east of LZ E had only an occasional sniper or mortar shell to harass them, but suffered many accidents. No less than 10 of the Horsas were destroyed and 7 damaged with 17 troops killed and 63 injured. Of the Wacos 9 were destroyed and 15 were damaged, but only 22 of their passengers were injured and none killed. The glider pilots apparently had no deaths and few injuries.

The 434th Group, flying second in GALVESTON, reached its release area at 0701, nine minutes ahead of time. Unlike the first serial it appears to have released on LZ W and, despite lack of beacons and markers, to have done so very accurately. The 82d Division credited it with 20 gliders landed on the zone, 19 within a mile of it and 8 within 2 miles. One was 2½ miles off and one 4½ miles away. Accidents destroyed 16 Wacos and damaged 26, but no troops were killed and only 13 injured. Moreover, at least 19 jeeps, 6 trailers and 7 guns were found in usable condition. The enemy around Turqueville still kept LZ W under fire, but in spite of them the gliders were unloaded in fairly good time and the glider troops assembled near les Forges.<sup>31</sup>

The last glider mission in NEPTUNE was HACKENSACK, which was flown to LZ W two hours after GALVESTON. Its lead serial, 50 planes towing 30 Horsas and 20 Wacos, was provided by the 439th Group at Upottery. This carried the 2d Battalion, 325th Glider Infantry and most of the 2d Battalion, 401st Glider Infantry, which was attached to the 325th and acted as

its third battalion. These numbered 968 troops,\* of which Horsas carried over 800. The cargo included 5 vehicles, 11 tons of ammunition and 10 tons of other supplies. The other serial consisted of 50 planes and 50 Wacos of the 441st Group from Merryfield. They carried 363 troops,† mostly service personnel of the 325th and 401st, and 18 tons of equipment, including twelve 81-mm. mortars, 20 jeeps, 9 trailers and 6 tons of ammunition. A pathfinder aircraft, piloted by Col. Julian M. Chappell, commander of the 50th Wing, and Lt. Colonel Kershaw of the 441st, accompanied the serial to guide it to the zone.

Take-off, conducted from static hook-up, was begun at 0647 from Upottery and about 0717 from Merryfield. Some of the troop carriers complained that the airborne had seriously overloaded their gliders, making them difficult to handle. The sky was leaden and the air so rough that spectators on the ground could easily observe the pitching of the gliders. After England was left behind, conditions improved. The ceiling rose from 2,000 to 8,000 feet and the clouds thinned out. Over France they were scattered with bases over 3,000 feet, and visibility was excellent. Like the daylight missions of the day before, HACKENSACK was accompanied from the English coast by a large escort which the troop carriers described as excellent and very reassuring. The approach was made by the east-coast route over the St. Marcouf Islands and UTAH to LZ W. No enemy planes were seen, and ground fire was negligible until the LZ was reached. Even there it was directed mostly at the gliders. The lead serial began its release at 0851, nine minutes ahead of schedule, and the other released its first gliders at 0859, eleven minutes early. They then turned to the right, and went home as they had come except for the authorized short cut from the English coast to the wing assembly area. Meager small-arms fire during and after the homeward turn scored some hits. Three planes in the 439th and eight in the 441st were damaged, but none were lost. In general the flights held together during the return. Between about 1000 and 1038 all pilots arrived at their bases, except one who landed at Warmwell with a dead engine.

\*According to the 82d Division, the number was 982. (Hq 82d Abn Div, Action in Normandy, Annex 5.)

†The operations report of the 441st Group lists 463 troops, but this figure appears to include the pilots and co-pilots of the gliders.

Release had been made from about 600 feet. The 439th Group seems to have released by squadrons, rather than as a unit, and, since there was no marking on the zone to guide them, the glider pilots headed wherever they saw a promising spot. A dozen gliders from one squadron came down near the northern end of the zone under intense fire which killed several of the troops before they reached the ground. Most of the gliders in another squadron came down about a mile west of the zone, while a third had several land about 2½ miles east of it. The last squadron's gliders were released over the southwest side of LZ W with the result that some came down in the flooded area, which at that point extended very close to the zone, if not actually into it. Of 29 Horsas accounted for, 12 landed within a mile of the zone, 7 more within 2 miles of it, 9 from 2 to 4 miles away, and one 9 miles off. Of the Wacos, 7 were within a mile, 6 more within 2 miles, and 6 between 2 and 4 miles away, one location being unspecified.

Small fields, high trees, flooded marshland, poles and wires set up by the Germans, debris from previous glider landings, enemy fire caused numerous accidents. No less than 16 Horsas were destroyed and 10 damaged in landing, 15 of the troops aboard them being killed and 59 injured. Of the Wacos only 4 were destroyed and 10 damaged, apparently without casualties. Two glider pilots in the serial were killed, and 10 or 11 injured.

For no obvious reason the comparatively inexperienced 441st Group did vastly better than the three preceding serials. It made a concerted release over the northern part of LZ W, and its gliders started down in the approved spiral pattern. The hazards and obstacles already described forced many glider pilots to zig-zag about, looking for a safe landing place, but by daylight in Wacos released above 600 feet they could pick and choose in an area of several square miles. At least 25 gliders in this serial hit the zone, another 19 were within about a mile of it, and the remaining 6 were probably not far off. Although 8 Wacos were destroyed and 28 damaged, only one of the airborne occupants was killed and 15 injured; while 18 out of 20 jeeps and 8 out of 9 trailers came through unscathed. One glider pilot was killed and five injured. Highly accurate, with few casualties and with cargoes almost intact, this one serial reached

the standard that glider enthusiasts had dreamed of.

By about 1015 all battalions of the glider regiment had reported in and were ready to support the 82d Division. The glider men's first task was to send a battalion westward to Carquebut to deal with the Germans who had held out so stubbornly there on the previous night against the 8th Infantry.

The unit arrived early in the afternoon only to find the area deserted. The Germans had fled. It then followed the rest of the 325th to Chef-du-Pont where the regiment was to report for duty as divisional reserve of the 82d Division. That evening the 1st Battalion had 545 officers and men fit for duty, the 2d Battalion had 624, and the 3d had 550. Only 57 of their troops were missing, all but one of those being from the 1st Battalion. Despite the death or injury of 7.5 percent of its men during landing about 90 percent of the regiment was ready for action.<sup>32</sup>

### **Evaluation of the Glider Missions**

The glider operations had gone as well as most experts expected and vastly better than some had predicted. The predawn missions had demonstrated that gliders could deliver artillery to difficult terrain in bad weather and semidarkness and put 40 to 50 percent of it in usable condition within two miles of a given point. The missions on D plus 1 had shown that by day infantry units could be landed within artillery range of an enemy and have 90 percent of their men assembled and ready for action within a couple of hours. While some felt that CHICAGO and DETROIT proved the feasibility of flying glider missions at night, the general consensus was that landing in daytime or at least about sun-up had proven to be much more accurate and much less subject to accidents and that the vulnerability of gliders to ground fire had been overrated.

Many of the difficulties encountered had been unavoidable, particularly those of terrain and of weather. However, the glider pilots were convinced that they would have made better landings if provided with low-level oblique photographs plainly showing the tree-studded hedges. Also DETROIT would have benefitted from a warning to avoid the cloud-bank on the west coast.

In ELMIRA and GALVESTON confusion and

casualties resulted from German occupation of LZ W and from the inability of the 82d Division to inform the troop carriers of the situation. One solution proposed to avert such crises was to send an advance party with ground-air radio to talk the gliders in. Since such a party might itself fall prey to enemy action or to accident, it seems that provision might also have been made for alternate zones and for standardized visual signals to indicate that zones had been changed. As will be seen, this problem could also arise in parachute resupply missions and played a serious part in MARKET.

American experience in Normandy indicated that the Waco was easier to fly, much easier to land, and very much more durable than the Horsa. Such a conclusion was not entirely warranted, since the unfamiliarity of their American pilots, the low release altitudes of the American missions, and the use of fields of minimum size for landings had combined to show the Horsas in an unfavorable light. In Normandy and in other operations later the British got good results with the big gliders.

The IX Troop Carrier Command was also convinced that its operations in NEPTUNE had proved the superiority of the Griswold nose, designed to protect gliders against vertical obstacles like trees and posts, as compared to the Corey nose which enabled gliders to ride up over logs or other low, horizontal obstructions. Again the verdict was premature. Had the Germans felled trees instead of erecting posts as obstacles the Corey nose might have been preferable.

In hopes of recovering a substantial proportion of the gliders used in NEPTUNE the AAF had sent to England 108 sets of glider pick-up equipment. In essence this apparatus was simply a hook underneath an aircraft fuselage. As the plane flew low over a stranded glider the hook would engage a loop of tow rope raised on a light frame and snatch the glider into the air. Since an empty Waco weighed less than 3,700 pounds, the shock of the pick-up was not excessive.

Although IX Troop Carrier Command had put half its pick-up sets in storage, damaged 20 others, and had only a limited number of crews qualified for pick-up operations, its resources proved to be more than sufficient. The American Horsas in Normandy were practically all unflyable.\* All but

\*The British retrieved some of their Horsas late in the summer, using Dakotas with American pick-up equipment.





Figure 7. Pick-up of a Waco Glider from a Field in Normandy.

about 40 of the Wacos were also found to be un-serviceable or inaccessible to pick-up planes. Many of the remainder were damaged by vandals before they could be picked up. Some gliders in marginal condition might have been repaired on the spot or after a short flight to some base in Normandy. However, the troop carriers did not and could not have guards, bases or repair units in Normandy for many weeks after NEPTUNE. The ground forces, hard put to it to sustain their fighting men, opposed the landing of any unessential personnel, and the few bases in the beachhead were jammed to capacity with fighters. Bad weather and the combat situation combined to delay recovery operations until 23 June. After that, 15 gliders were picked up and flown back to England. The technique worked well. However, 97 percent of the gliders used by American forces in Normandy had had to be left to rot.<sup>33</sup>

The status of the glider pilots after landing was anomalous. They were troop carrier personnel, and, while they had been given some training in infantry tactics, it had been short and relatively sketchy. Yet they constituted 20 percent of the approximately 5,000 men brought into the battle area by glider. Plans called for them to assist in the unloading of the gliders and the clearing of

the landing areas, to assemble under the senior glider pilot in their vicinity, and to report to the headquarters of the airborne divisions for such duties as might be required of them. It was contemplated that they would guard command posts and prisoners until a firm link-up with the amphibious forces was made and then be evacuated as soon as possible.

A majority of the glider pilots followed this pattern, and on the whole did very well. About 300 gathered at Raff's headquarters near les Forges and 270 of them were evacuated to the beaches on the afternoon of the 7th. About 170 others who had been guarding the headquarters and prisoners of the 82d Division west of Ste Mère Eglise departed for the beaches with 362 prisoners at noon on 8 June after General Ridgway had addressed them in a speech, later embodied in a commendation, which thanked them warmly for their good service in Normandy. Most of the rest were collected and evacuated within three days after they landed.

While many glider pilots, particularly those landed in outlying areas, had attached themselves as individuals to airborne units and fought with them for a day or two, combat participation by the great majority was limited to a short period

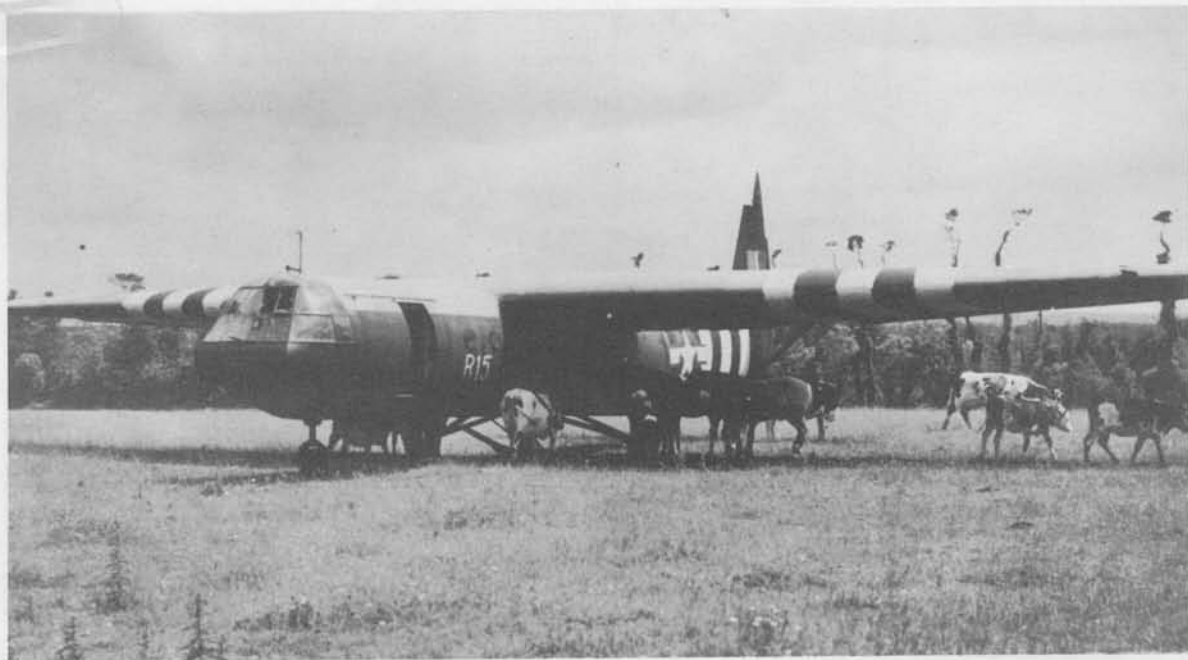


Figure 8. Horsa Glider of IX Troop Carrier Command after Landing in Normandy.

during unloading and assembly. There are few cases in which glider pilots were killed or wounded after leaving the vicinity of their gliders.

Out of 1,030 American glider pilots reaching Normandy all but 197 had been accounted for by 13 June. What had happened to most of those missing at that time is indicated by a rise in known casualties from 28 on 13 June to 147 on 23 July. Of the latter total 25 were dead, 31 wounded and 91 injured. An additional 33 who were still missing were probably prisoners.

The discipline and ground combat training of the glider pilots were criticized by the airborne and by some of their own members. However, the policy of quick evacuation had worked well in Normandy and had won general acceptance. As long as it was assumed that glider pilots could and should be quickly evacuated there was no justification for giving them extensive infantry training. It seemed much more important to improve their proficiency in tactical landings.<sup>34</sup>

### **Parachute Resupply Missions**

Two large parachute resupply missions were flown on the morning of D plus 1. The first, FREEPORT, was performed by the 52d Wing for the 82d Division. It was a scheduled mission

with the time of the initial drop set at 0611. The other, MEMPHIS, conducted by the 50th Wing for the 101st Division, was set up to drop at 0635, but only if specifically called for. The formations and speeds to be flown in these missions were like those in the paratroop serials, except that speed during the drops would be 120 miles an hour instead of 110 miles an hour. The route was that taken by the daylight glider missions with approach and return over the St. Marcouf Islands. The altitudes to be maintained were 1,500 feet over England, 1,000 feet over Portland Bill, 500 feet to the drop zone, and beneath 500 feet from the zone back to GALLUP. If possible the zones were to be marked with panels, smoke and beacons, but it was understood these might not be available and that zones might have to be changed to suit the ground situation.

Cargoes were to consist of 6 bundles in each plane and six more carried in pararacks in all planes but those equipped with SCR-717. The normal load thus carried was only slightly over a ton, although a C-47 could carry almost three tons. The difference lay in the need to get the cargo out within half a minute so that it would all land on the DZ. More might have been delivered had British roller conveyers been used, but the canvas covers of American containers were apt to jam the con-

veyers, and a decision had been made in March not to use British wicker containers.<sup>35</sup> The 2d Quartermaster Depot Supply Company, a unit of IX Air Force Service Command, was supposed to manage the loading of planes for aerial resupply operations and to provide dropmasters to handle the actual dropping with the assistance of crew chiefs and radio operators. That company had neither enough men nor enough training to do the job. Made up of soldiers without previous experience in supply work, it had received its first personnel on 25 April. Although it had been exposed to a two-week course in aerial resupply, only 98 of its members had qualified as supply droppers and been placed on flying status in time for NEPTUNE.

Under pressure of the supply needs of the airborne troops FREEPORT had grown during May from a 185-plane mission to one of 196 and finally of 208 planes. These were drawn from the 61st, 313th, 314th and 316th Groups, each of which contributed a 52-plane serial. The 82d Division had asked for 250 tons of supplies. Because some items were not obtainable the mission carried only 234 tons, about half of it ammunition, plus 22 paratroops who had been brought back on the previous night. The lead serial carried 54 quartermaster personnel to act as dropmasters. In the other formations the crew chief and radioman would have to shove out the bundles in the planes. As for the bundles in the pararacks, they would salvo like bombs at the touch of a switch, providing the mechanism worked.

The first take-off was made by the 313th Group at 0310. The 316th Group was delayed for 15 minutes when two of its planes collided as they taxied into position. Both aircraft were badly damaged and one pilot was killed. The other 206 planes chosen for the mission all took off successfully. Among them were 11 C-53's, although these had smaller doors than the C-47 and were not designed to carry cargo.

There was no light of sun or moon to help the planes assemble, and layers of heavy cloud covered the sky, the lowest being considerably under 1,500 feet. However, the layers were broken in places, and there was space enough between them at about the 1,500-foot level for the groups to form their serials. Having been assured at briefing that the weather, though unfavorable, would not require instrument flying, the troop carriers set out boldly into the murk.

Instead of improving as they proceeded, the weather grew rapidly worse. Over the route for most of the 120 miles between ATLANTA, the wing departure point, and ELKO, the command assembly point, hung a solid mass of clouds with bases as low as 300 feet and tops as high as 10,000 feet. Icing conditions prevented flight over the clouds. Passage through the narrow crack between clouds and ground was hazardous, though many pilots tried it. Most flew into the clouds and attempted to continue individually on instruments. In spite of the Rebecca beacons along the course a majority of these pilots lost their way at least temporarily. Radio channels to the troop carrier CP at Eastcote were swamped by requests for information and instructions. Some planes, particularly in the rear flights of the 316th Group turned back under orders. Others flew around until they ran short of fuel and had to land at fields in southern England. While some pilots took off to try again, at least 14 were refused permission to go on. In all, 51 planes failed to leave England and one other crashed, killing everyone aboard, in an attempt to land at Oxford.

Over southern England the weather was better, and over the channel there were only high scattered clouds, giving about  $\frac{3}{10}$  cover at 8,000 feet. Also, by the time the first planes reached Portland Bill the sun was rising. It was thus possible to re-form off the south coast. This was certainly done by most of the 61st Group and by portions of later serials. However, many pilots failed to recover contact with any large formation and went on alone or in small bunches.

From England to Normandy the mission was given the same powerful escort and fighter cover as the daylight glider missions. No enemy planes attempted to penetrate this screen. One straggler in the 314th Group received a blast of anti-aircraft fire from Allied shipping off the St. Marcouf Islands which induced him to give up and go home. A pilot in the 313th also reported naval fire, but it stopped when he signaled his identity.

FREEPORT, like GALVESTON, made landfall on the north side of the Douve estuary. There a perplexing discrepancy appeared. The orders and briefing of the pilots had called for a drop on DZ N, a mile north of Picauville on the west side of the Merderet. However, as the main body of the 61st Group approached the shore, it received the prescribed signals from a Eureka beacon near

Ste Mère Eglise, 2½ miles northeast of DZ N. The 82d Division, cut off from its units on the west bank of the river, had ordered the beacon to go into action on DZ O. Apparently no smoke or panels were used.

The 61st Group formation followed the radar signals to DZ O and dropped its bundles in that general vicinity at about 0603 from between 400 and 600 feet. It reported that the dropmasters provided by the quartermaster company were for the most part awkward, timid, and airsick and of little help in kicking out the bundles.\*

After this initial drop the situation became chaotic. Stragglers and small groups, often drawn from several different flights kept arriving at irregular intervals until 0815. A few of them received the radar signals and dropped their loads on or near DZ O. Elements of the 313th and 316th Groups totalling at least a dozen planes made their drops on LZ W. Nearly half the pilots followed their maps and their instructions to DZ N. Perhaps the objective seemed too obvious to require use of Rebecca; perhaps the policy of restricting the use of radar to serial and flight leaders was still exercising its baneful influence; certainly a four-man crew without a dropmaster to help them would be too busy preparing to dispose of their load to tinker with a Rebecca in the last minutes of their run unless it seemed necessary.

In all, at least 148 planes dropped approximately 156 tons of supplies. Since the Germans held DZ N and most of the territory west of the Merderet, very little of what was dropped beyond the river could be collected at that time. Less than 100 tons were retrieved that day, and although ultimately about 140 tons were recovered,† the paratroops on D plus 2 were very short of food and ammunition and subsisted largely on a captured trainload of cheese.

The planes going to DZ O passed over the Germans in the Turqueville-Fauville pocket during their approach and swung over German-held territory west of the Merderet before completing their homeward turn. Those heading for DZ N had to fly for two or three miles over enemy posi-

tions. This proved costly enough to show that those who had predicted heavy troop carrier losses in NEPTUNE were not mere alarmists. The Germans put up only moderate small arms fire with little or no anti-aircraft, but this was sufficient to bring down 10 planes. Among those attempting to use DZ N the loss rate was probably over 10 percent. Of the downed aircraft, four crashed in Normandy, one was still missing a month later, and five were successfully ditched off the Normandy coast. Only one casualty was caused by ditching, while aboard the crashed planes 11 troop carrier men were killed and the rest of their crews were hospitalized or missing. All of these planes appear to have dropped at least part of their cargoes; one, piloted by Capt. Howard W. Sass, was already ablaze when the bundles went out.\*

Of about 140 planes which got back after being in the drop area almost all reached their bases singularly or in small groups between 0815 and 1050. Ninety-two were damaged, some very badly. Every squadron had its tale of hazardous returns. One aircraft, barely controllable and with one engine dead, had been coaxed back to Folkingham by way of the North Sea and the Wash so that it could ditch instantaneously if necessary. Between 15 and 20 had made forced landings at Warmwell and other points in southern England. None of the damaged craft had to be salvaged, but many required several days' work by service units. At the end of the month casualties in FREEPORT were listed as 15 dead, 20 wounded and 17 missing. It is not surprising that pilots reporting in after their return swore that second missions were jinxed.<sup>36</sup>

While MEMPHIS, the supply mission to the 101st Division, was less costly than FREEPORT, it was even less successful. Why it was sent at all is a mystery. The Headquarters of the 101st Division had not called for it, did not expect it, and had set out no markers or beacons to guide it. The mission thus had two strikes on it from the start.

MEMPHIS was to be flown by two serials, each of 63 aircraft, from the 440th and 442d Groups respectively. No facilities for air re-supply had been established at their bases, so the mission had to stage from Welford and Membury. The

\*There is very little evidence on the efficiency with which the supply dropping was conducted. One squadron reported that it took an average of 12 seconds per plane to get out its bundles. Others had trouble with bundles stuck in pararacks or jammed in doors, but the percentage not dropped for those reasons was very low, in the neighborhood of 1 percent. (CMR, Hq 48th TC Sq Mission "NEPTUNE" II, Resupply, 7 Jun 44, in unit hist file.)

†Probably including some delivered in MEMPHIS.

\*Sass went down with his burning plane, was catapulted into a hedge when it crashed, and survived with comparatively minor injuries.

planes were supposed to be there by 2130 on D-day for loading. The 440th began take-off from Exeter at 2020 and most of its aircraft reached Welford by 2130. The 442d did not depart from Fulbeck until about 2120, and sent only 56 planes. The 439th had sent six to Membury to complete the serial, but through some misunderstanding those planes had not come properly prepared and therefore could not go on the mission. Dropmasters from the quartermaster company took part in MEMPHIS, but the number involved is unspecified.

The 442d Group took off with 56 planes between 0421 and 0428 in the dim twilight before dawn. The 440th, perhaps more confident of its ability to assemble quickly, did not take off until about 20 minutes later. One of its 63 planes aborted because of a flat tire and was not replaced. A substitute had been on hand when the group left Exeter, but none was ready at Welford.

Fortunately for the 442d Group, the take-off bases lay south of the disturbance which upset FREEPORT, but the weather at the start was bad enough to make assembly difficult. An unbroken blanket of cloud covered the sky 1,500 feet up and northwest winds, blowing aloft at 27 miles an hour, drove rain squalls across the fields. However, beyond Portland Bill weather ceased to be an obstacle. The overcast became thin and broken with bases above 2,500 feet, and the wind abated. Over Normandy the clouds lay lower and thicker, but not seriously so.

The fighter protection over the Channel won, as in the other daylight missions, the enthusiastic admiration of the troop carriers. One pilot described his serial as surrounded above, below, and on all sides by fighters and declared that he had never seen so many at once as during that operation. Oddly enough, the first loss was caused by a friendly plane. Near UTAH Beach a bomb-cluster, accidentally dropped by a P-47, hit a plane of the 440th Group and set off ammunition in its cargo. The pilot managed to ditch his plane, but the explosion had killed two crewmen, a dropmaster, and a correspondent. Gunners on Allied ships off the St. Marcouf Islands fired at or near some planes in MEMPHIS, but briefly and without effect.

The 440th Group dropped its load, 63 tons of ammunition, 10½ tons of rations and 21 tons of combat equipment, between 0632 and 0639. Only

one pararak pack and seven bundles, which had damaged chutes, were brought back. The 442d Group, which had carried 678 pararaks and bundles with a gross weight of 126 tons, dropped 652 of them about 0638 from between 500 and 1,000 feet. The rest had stuck or were damaged. One dangling parapack was pried loose by a crew chief hanging out of the plane with the radio operator holding his ankles.

The supplies were supposed to land on LZ E near Hiesville, but Headquarters, 101st Division, located in that area, asserted that it saw no drop and recovered no bundles. The 442d Group reported that it deposited its cargoes near Blosville, 1½ miles west of Hiesville on LZ W. That zone, strewn with parachutes and gliders, would seem a logical objective to anxious pilots who had received no radar signals and seen no markers. The 82d Division, to which LZ W was assigned, presumably retrieved these supplies along with those dropped there about the same time by formations in FREEPORT. The embattled paratroops were doing very little paper work that day and probably went on the principle of all supplies gratefully received and no questions asked. The 8th Infantry may also have taken a share.

The course taken by the 440th Group is less certain, but most of its planes probably dropped between St. Côme and la Barquette. Colonel Johnson of the 501st PIR reported a supply drop in sight of his position at la Barquette about 0630. The drop was made some distance to the west of him, most of the bundles landing in no-man's land, behind the German lines, or in the Douve marshes. This in all likelihood was the work of the 440th Group. The group encountered heavy flak, of which there was hardly any north of St. Côme, and the history of one of its squadrons, the 98th, refers explicitly to observations made in the Douve area. Flying in from the northeast over UTAH Beach, as it was supposed to do, the 440th had only to persist on course after passing LZ E to come within sighting distance of the panels Johnson had put out requesting supplies and had only to veer a few degrees to the south to reach the Douve at the point where the drop was actually made. The failure to release the supplies over Johnson's position may be explained by assuming that the leader saw the panels too late to head directly over them and chose to drop west of the signals on his first run rather than make a second pass.

Some planes in both groups may have dropped at other points, particularly northwest of Ste Mère Eglise near DZ O. Elements of the 440th reported picking up a Eureka signal and following it in, although it was poorly received. The only Eureka known to have been in operation at the time was that on DZ O to guide FREEPORT. Its signals would naturally have seemed poor, since the Rebecca sets of the 440th were tuned to a different channel. At DZ O, as at LZ W, such supplies as were dropped would have been picked up by the 82d Division and, if accounted for at all, would probably be credited to FREEPORT.

MEMPHIS suffered much less from enemy action than its predecessor. Small arms fire at the 442d Group just after it made its drop caused minor damage to 21 planes and wounded two men. As the 440th Group turned left after its drop, flak smashed engines on two planes, forcing them to ditch. Fourteen others in the serial were damaged, 11 of them severely enough to need 2d and 3d echelon repairs. Two men were wounded. The groups returned to their home bases, not those from which they had staged. The 440th, reached Exeter at or about 0828. All planes of the 442d except one, which had landed at Warmwell, were back at Fulbeck by 0905.<sup>37</sup>

The ineffectiveness of FREEPORT and MEMPHIS was primarily due to lack of radio contact between the airborne commanders and IX TCC. With such contact MEMPHIS would either not have been sent or would have been given adequate instructions and a zone equipped with navigational aids. With such contact the pilots in FREEPORT would not have been dispatched to a zone which was wholly in enemy hands. The atrocious weather which broke up the formations in FREEPORT and forced a quarter of the pilots to turn back was pure bad luck. It was also fair warning that in Western Europe operations relying on aerial resupply would have to gamble on the weather. The losses caused by enemy fire in FREEPORT were a reminder, if one were needed, that troop carrier formations were vulnerable and that passage over alerted enemy troops could be costly.

By noon on 7 June all major airborne missions in NEPTUNE had been completed. However, six small parachute and glider resupply missions were flown later on call. All of them went smoothly without enemy opposition and without appreciable hindrance from weather. On the 8th a single air-

craft of the 441st Group, staging from Greenham Common, took off at 0700 hours with 150 pounds of medical supplies for the 101st Division. Escorted by four P-38's, it flew over the route used in HACKENSACK, made its drop, probably on LZ E, and returned unmolested. Next day two gliders with badly needed signal equipment landed successfully near Ste Mère Eglise about 1845. The recipient in this and the four following missions was the 82d Division. On the 10th the 436th Group dispatched six aircraft from Membury with Wacos. The gliders held 2 jeeps, 2 soldiers, and 6½ tons of combat equipment. Released at 1740 near Ste Mère Eglise, they made excellent landings in the area designated. On 12 June nine planes of the 436th Group flew a paradrop re-supply mission, carrying 2 tons of 60-mm. and 81-mm. mortars and 5 tons of ammunition stowed in 54 parapacks and 25 bundles. At 0802 they made an accurate drop of all but one parapack from an altitude of 300 feet on a zone just east of Ste Mère Eglise. Five aircraft of that Group towed Waco gliders to the same zone that evening. Aboard the gliders were 2 jeeps and 42 airborne troops, and one of the planes carried 15 paratroops.\* The gliders were released and the paratroops then jumped about 2021, all landing safely on the zone. The Germans, who still held positions within four miles of Ste Mère Eglise, responded to the landing by shelling the area. The last of these missions was flown on the 13th by 11 planes of the 436th Group. Escorted by 12 P-38's they towed 11 Wacos to Ste Mère Eglise. The gliders contained 1½ tons of ammunition and 13 tons of equipment. Release was made at 1913 from a height of 600 feet and the landings were thoroughly successful.<sup>38</sup>

### **The British Missions and WILDOATS**

The British airborne operations in NEPTUNE provide a useful, if imperfect, yardstick by which to rate American performance. Their paratroop missions were unquestionably more accurate than those of IX Troop Carrier Command, although their pathfinders had been rather less successful. One of their three zones was almost without pathfinder aids because one team intended for it had

\*Such a dual role was unusual because paratroops preferred to jump from a tight formation rather than a long glider column, and because of the restriction of gliders to follow-up operations.

been dropped out of reach and the other had lost its equipment. Another team inaccurately dropped set up its beacons on the wrong zone, two miles from its own. Nevertheless, in the main paratroop drop, which was to begin 0050 hours on D-day about 30 percent of the 237 pilots dispatched hit their zones, 25 percent came within a mile and 10 percent dropped their sticks within two miles. Most of the drops farther away could be blamed on the lack or misplacing of pathfinder aids. On the one zone where the aids were wholly satisfactory at least 75 percent put their sticks within a one-mile radius, and the units dropped there mustered about 60 percent of their strength in the initial assembly.

This superior performance convinced the British that the American troop carrier tactic of flying in serials was inferior to their own method of individual navigation. The glider-towing planes of 38 Group flew in loose pairs at 20-second intervals, and 46 Group flew in V's of three aircraft at 30-second intervals. General Browning was so sure that the technique of 38 Group was better that he recommended that IX TCC adopt it.

Actually, the British had had certain advantages which made the comparison misleading. They encountered no serious cloud obstacle such as that which upset the American missions. Their drop zones, which they approached directly from the Channel coast, were respectively 2, 3, and 5 miles inland. Thus, although enemy fire was intense enough to bring down seven planes, a ratio comparable to that in ALBANY and BOSTON, it had little time to affect navigation. Most important, all their planes had Gee and about 90 percent of the crews used it effectively. Rebecca was relegated to a supplementary role. The Americans simply did not have enough Gee sets to go around. If ALBANY and BOSTON had flown the British route, and if stragglers in those missions had had both Gee and Rebecca sets with qualified operators and freedom to use them, IX TCC would certainly have made a much better showing than it did. However, it does seem that the American serials, even when accurately led and substantially intact, as in the drops of the 505th PIR, put more men outside a one-mile radius of their zone than did the British system of individual drops—presumably because darkness and bad weather had loosened the formations.

The British also flew glider missions before dawn on D-day, and in these, too, Gee served them

well. Despite strong winds and low clouds which caused about 20 of the 98 gliders dispatched to break loose or be cast loose prematurely, they landed 52 on their zones and 6 more within a mile of them. Landing accidents were numerous, further proof of the costly nature of night glider operations. On the evening of D-day the British dispatched their main glider mission with 256 Horsas and Hamilcars\* in tow. Their landings, beginning at 2051, were highly successful. Only one or two gliders were shot down, and 246 landed on or very near their zones. However, the risk of antiaircraft fire in this twilight operation had been minimized, since by then the British had full possession of the terrain over which the approach was made and had pushed their front well beyond the landing zones.

The only large British resupply drop was to be made by 50 planes of 46 Group at midnight of D-day. Once again, as in the invasion of Sicily, jittery naval gunners loosed a barrage on an airborne mission with the result that six planes were lost and only 20 percent of the supplies dispatched were received by the airborne troops. Four small resupply missions flown in daylight by 38 Group were fairly successful, although in one of them 7 out of 12 planes were recalled because of low clouds like those that forced recalls in FREE-PORT.

One important respect in which the British pioneered was the dropping of heavy equipment. On D plus 4 they successfully dropped six 6-pounder guns and six jeeps into Normandy from the bomb bays of six Halifaxes flying at a height of 1,000 feet. Each item was packed in a protective frame and provided with a cluster of twelve 32-foot parachutes to cushion its descent. Only one jeep was damaged enough to be unserviceable. To understand what an advance this was, it should be observed that the Americans at that time were still breaking down their pack howitzer into seven bundles to get it out the door of the C-47.<sup>39</sup>

Another important airborne operation was planned but did not take place. After its missions with the 82d Division the 52d Wing had been held on the alert for missions with English troops. The British ground commanders asked for an operation called WILDOATS to achieve a breakthrough by dropping and landing the British First

\*The Hamilcars successfully brought in Tetrarch tanks, an item which would have been invaluable to the 82d Division.

Airborne Division near Evrecy ahead of an attack by 7 Armored Division. The paratroops would be dropped by the 52d Wing, after which the glider echelon would be delivered by British troop carriers, assisted by the 435th, 438th, 440th and 441st Groups. Leigh-Mallory presided over a meeting at Stanmore on 11 June to consider this enterprise. There troop carrier and airborne representatives voiced strong objections to WILD-OATS. If flown in from the east coast of Normandy it would go over the invasion fleets (the commander of which refused to prohibit anti-aircraft fire during the missions), over the beachhead, and over the German front lines. An approach from the other side of the peninsula required a flight of more than 50 miles over enemy territory, much of it out of range of navigational aids. During most of the night there would be no moon. By day the risks from enemy fire would be very great whatever the route. Nevertheless, the ground forces were so insistent that the critics reluctantly accepted the operation.

WILDOATS was to be launched on 14 June with the first paratroops jumping at 0420. The gliders would follow close behind the jumpers and begin landing at 0530. The route, excepting certain minor variations, ran from Portland Bill to a point off Cape Barfleur, thence to the St. Marcouf Islands and from there to Bayeux, the IP, which was about 16 miles north-northwest of the drop and landing zones. Return would be made by a reciprocal route.

On 12 June wing commanders and key staff officers were briefed at Eastcote. On the 13th group commanders and staffs were briefed and the briefing of crews was begun. That very day, however, a German armored division hurled back the British at Villers Bocage and took the initiative in that sector. Under those circumstances WILD-OATS would have been extremely dangerous. Accordingly it was postponed on the evening of the 13th and was formally cancelled on the 17th. This decision put an end to airborne operations in NEPTUNE.<sup>40</sup>