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The AAF IN THE INVASION OF Southern France

An Interim Report



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Wings at War

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Foreword

The AAF in the Invasion of Southern France tells how the Mediterranean Allied Air Forces, under the command of Lt. Gen. Ira Eaker, supported the Allied airborne and amphibious assault designed to undercut German defenses in Occupied France. In this invasion—the fourth major one in three months—American air power overwhelmed the meager enemy forces and diverted attention from the north, helping to topple German control in Vichy. Air operations persistently found, fixed, and fought occupying German forces, preventing their orderly withdrawal, greatly easing the way for Allied invasion forces.

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The Invasion of Southern France

PRE-INVASION SITUATION

WHEN Allied airborne and amphibious troops invaded southern France in the early morning of 15 August 1944, they set in motion the fourth major onslaught against the occupied Continent in 3 months. First blow had been struck in Italy with the Allied offensive which began on the night of 11-12 May and had carried forward some 200 miles to the Pisa-Rimini line, liberating Rome and liquidating at least a dozen German divisions. Second blow had been the cross-channel invasion of Normandy which began on 6 June and had broken the German 7th Army, surrounded most of it, and was on the verge of capturing Paris. Third blow had been the massive Soviet attack across the Pripet Marshes which began on 22 June and had split the Baltic States at Riga, reached Warsaw in Poland, and was poised on the boundaries of East Prussia itself.

This was the picture on 15 August, the date set for invasion.

Thus the new Allied uppercut against southern France found the Germans in a situation which was already desperate. Though the Allied threat to the Riviera had been obvious for months, the hard-pressed Germans had been obliged to pull away a sizable proportion of the forces they had allocated to defend it. Only 10 Nazi divisions remained south of the River Loire and but 7 were actually deployed along the Mediterranean coast. Even more depleted, after a year of strategic bombing by the Allies, was the German Air Force. It was estimated to have in southern France the puny total of 200 operational aircraft, of which 130 were bombers designed for antishipping attacks. It was believed that the Hun might be able to scrape together from Italy and northern France another 50 bombers and 80 single-engine fighters. As for German naval defenses, these consisted of a handful of destroyers and torpedo boats and perhaps 5 U-boats.

Depleted and dispersed though the German defenses were, their capabilities were still considerable. The coast they were guarding is a rugged one, with rocky promontories overlooking the small beaches. The French had long ago established a number of well-sited coastal batteries at the obvious points. These the Germans increased, while they also deployed some 450 heavy and 1,200 light antiaircraft guns in the area, largely along the shore. Finally, there seemed little chance of tactical surprise since the Allied build-up in Corsica was clearly visible to German reconnaissance aircraft.

For the invasion the Allies marshalled a force with a clear-cut and overwhelming superiority in every respect. Against the Luftwaffe's 200 furtive aircraft, the Mediterranean Allied Air Forces could muster 5,000. Against the 7 weak German divisions the United States Seventh Army could throw in a stronger force of crack United States and French divisions, plus an assortment of paratroop, Commando, and Special Service forces. And the dinky German naval units would sally, if they dared, in the face of 450 British, United States, French, and Italian warships, including about 5 battleships and 10 aircraft carriers.

In collecting this mighty array, the Allies had faced two difficult problems: (1) the redeployment of the available ground and air forces so as to be able to hit southern France *without* at the same time hamstringing the advance of the Fifth and Eighth Armies in Italy, and (2) the build-up of primitive, malarial Corsica into a satisfactory springboard for the air participation in the landings. Both these matters are dealt with later. It suffices for this introductory summary of the situation to record that XII Tactical Air Command under Brig. Gen. Gordon P. Saville was charged with the responsibility of providing the air cooperation. By D-day it was effectively installed on 14 Corsican operational airfields, with all supplies needed to maintain about 40 United States, British, and French squadrons, plus some 6 squadrons on loan from the Strategic Air Force. Other elements of MAAF on call from XII TAC were based as follows: Provisional Troop Carrier Air Division—west coast of Italy above Rome; Desert Air Force—North Central Italy; Tactical Air Force's medium bombers—Corsica and Sardinia; Strategic Air Force—Foggia area; Coastal Air Force—scattered throughout area; and, finally, a Carrier Task Force, standing offshore between Corsica and Toulon.

INTENTION

The major purposes behind the operation were (1) to assist the Normandy attack by engaging German forces that might otherwise be used in northern France; (2) to capture a major port through which large-scale reinforcements could flow; (3) to liberate France; and (4) to join up with the cross-channel invasion for the decisive battle with the German armies of the west.

The initial assignment of the Seventh Army, as stated in its Field Order No. 1, was to "assault the south coast of France, secure a beach-head east of Toulon and then assault and capture Toulon." Thereafter its intention was to advance toward Lyon and Vichy or westward to the Atlantic as determined by developments, eventually joining up with the Allied armies in northern France.

The task of the AAF, as stated in MAAF's Outline Plan of 12 July, was as follows:

- (a) To neutralize the enemy air forces.
- (b) To provide air protection to the assault convoys, the assaults, and to subsequent operations.
- (c) To prevent or effectively retard movement of enemy forces into the assault area.
- (d) To assist the assault and subsequent operations of the ground forces by air action.
- (e) To transport and drop airborne troops engaged in the operation.
- (f) To cooperate with the Maquis by air action and air supply.

In addition MAAF had all its regular commitments to work with the armies in Italy and to conduct strategic bombing of German priority objectives and special operations in aid of the Partisans.

PLANNING

As far back as 1 April 1943 the eyes of the Allied forces in the Mediterranean were focusing on a possible landing in southern France. By 9 December 1943, the scheme had reached the point of decision, and a directive was issued to General Eisenhower to the effect that it would take place in May. Intensive planning began at once in accordance with Allied Force Headquarters directive of 29 December. On 4 February the combined planning staffs of Air, Army, and Navy met to compare views and on 31 March the first Provisional Outline Air Plan was issued.

Shortly thereafter, however, the stalemate in Italy forced a recasting of plans, and it was decided to shelve the plan and concentrate on a decision in the battle for Rome. The battle began on 11-12 May and almost immediately inflicted a shattering defeat upon the German armies. The Allies had just captured Rome and were in all-out pursuit of the disorganized enemy during early June when the Normandy assault began; it was clearly inadvisable to halt in the middle of success in Italy to invade southern France.

Not until the end of the month was the decision to execute the program finally made. By then the Allied armies in Italy had largely exploited their success and were slowing down in front of the formidable Pisa-Rimini defense line. And in Normandy, though Cherbourg had been taken and the beachhead secured, the Allied armies were temporarily stalled and had fallen definitely behind schedule. Action was wanted and wanted quickly. Most of the high command in the Mediterranean would have preferred to concentrate on advancing the rest of the way up Italy and thence into the Hungarian plain. However, on 2 July invasion was decided upon, with direction that it be launched on 15 August. Gen. Sir Henry M. Wilson had already, on 28 June, approved the Outline Plans, and on 7 July AFHQ directed that they be put into effect.

MAAF's Outline Air Plan, which was issued in final form on 12 July in compliance with this directive, laid down the broad tasks and assigned the control of operations as follows:

(a) C. G., Tactical Air Force, in addition to present responsibilities, to be responsible for detailed planning, for conduct of intruder operations, for protection of all convoys within 40 miles of the beaches until assumption by A. O. C., MACAF of responsibility for the defense of southern France, for Air Sea Rescue in the assault area and for organizing and directing Troop Carrier operations.

(b) A. O. C., Coastal Air Force, in addition to present responsibilities, to be responsible for defense of all convoys to within 40 miles of the beaches, for special overseas reconnaissance, antisubmarine work, etc., and for Air Sea Rescue outside the assault area.

(c) C. G., Strategic Air Force to be responsible for help as required by C. G., MATAF, such requests to be passed on by Hq. MAAF.

(d) C. G., XII Tactical Air Command to be in control, under C. G., MATAF, of all tactical units operating in the assault area, including carrier-borne aircraft.

(e) C. G., AAF Service Command to be responsible for supply of all units in Corsica.

(f) C. G., AAF Engineer Command to be responsible for developing airfields in Corsica and southern France.

Following this directive from MAAF, each of the three major units involved—Strategic, Coastal, and Tactical Air Forces—produced its own plan for its share of the invasion. In the case of Strategic and Coastal, the operation posed no major problems, calling for little more than normal performance of routine tasks. Upon Tactical fell the major burden of the job and its commander, Maj. Gen. John K. Cannon, besides planning the actual assault operations, had to reorganize his entire air force and occupy the new bases in Corsica. As of June 1944 MATAF was a joint command composed chiefly of the British Desert Air Force and the U. S. Twelfth Air Force. TAF was functioning entirely in cooperation with the Fifth and Eighth Armies in Italy, whose advances had been made possible by its spectacularly successful interdiction of German supply lines. General Cannon's problem was to keep enough air power behind General Alexander to enable the Fifth and Eighth to continue their advance and at the same time muster adequate striking force for the assault on France. He solved it by leaving to Desert Air Force the cooperation with the armies in Italy and moving XII Tactical Air Command (a hybrid outfit consisting chiefly of fighters and fighter-bombers) to Corsica. MATAF's two medium bomber wings were kept separate, available to help either Desert Air Force or XII TAC as occasion arose. These arrangements were promulgated on 7 July in MATAF Operations Instruction No. 2. MATAF's Outline Plan, issued the next day, made provision for the operations of troop carrier units being borrowed from England and called upon XII TAC to prepare the final detailed assault plan. This was issued as Operations Order No. 1 on 8 August, while the over-all MATAF bombing plan appeared as Operations Instruction No. 3 on 4 August.

Plans contemplated the use of airborne troops. Since the Mediterranean theater had been largely stripped of troop carrier units for Normandy, it was necessary to borrow them back again from England. Accordingly, dispositions were made as described in the section on the airborne phase of the operation, which appears later.

BUILD-UP

Supplies—Corsica

When the scheme was first approved at the end of 1943 with a target date of late May, an immediate survey was instituted to ascertain how many airdromes could be constructed there and how many groups could be supported. Simultaneously exhaustive study began on the signals and communications requirements. It was at once obvious that a difficult logistic and construction job was in prospect. This was energetically pushed throughout the spring and not allowed to lag even during the months when invasion was on the shelf.

There were only two ports on the island. Ajaccio, with a capacity of 3,000 tons a day, could accept one Liberty ship at a time providing the draft was not more than 22 feet. Bastia could accept 2,000 tons a day by coasters or other small vessels. However, Bastia could not be used because the Germans were mining the channel nightly. The terrain in Corsica made it imperative to build practically all operational airdromes on the east coast.

No internal transportation existed. Every railroad bridge on the east coast had been demolished. Bridges and tunnels on the cross-island route from Ajaccio to Bastia had been destroyed. It was evident, therefore, that our forces would have to rely on their own transportation facilities for the movement of supplies in Corsica, and that the build-up of any considerable operation would have to proceed gradually over a period of months. The following steps were taken:

A small artificial port was constructed, Portovecchio, capable of receiving 200 tons a day in very small vessels.

A build-up was immediately begun at Ajaccio on the east coast, and shipments were made to east-coast airdromes as they were constructed, by LCT, supplies for the most part in the early stages being offloaded over the beaches. This was alleviated somewhat at a later date when the Navy agreed to take LCT's into Bastia.

A gasoline pipeline was constructed from Portovecchio to Bastia with a reversible pumping system so that the line could be operated from both ends. This pipeline had a capacity of 45,000 barrels daily; 111,000 barrels for bulk storage were erected on the island; 59,000 barrels for bulk storage already existed on the island of Maddalena. This storage was kept full as a readily available reserve. In addition,

100,000 barrels in tankers were kept at Maddalena as floating storage for immediate call forward.

Personnel build-up into Corsica had started months before with the accumulation of supplies, which proceeded over a period of approximately 3 months. By 15 May, all elements of Coastal Air Force scheduled for Corsica were on the island, as well as a bombardment wing of the Twelfth Air Force, together with certain elements of an RAF wing, constituting a coastal air force of offensive striking power. In addition to the above forces, the operation called for the XII Tactical Air Command, reinforced by some French squadrons and some RAF squadrons, as the main assault force. All of these forces were actively engaged in cooperation with the armies in Italy until D minus 20. This entire assault force was moved into Corsica in an 8-day period, without any cessation in operations. This move was accomplished by dividing each squadron into advance and rear echelons, and by the use of an LST ferry lift.

The estimated requirement in bombs alone was 52,000 tons. This build-up was accomplished by bringing Liberty ships into Cagliari, where the supplies were transhipped into coasters, the coasters discharging along the east coast of Corsica. While the supply position of Corsica has always been precarious, presenting difficulties of arranging transshipments and meeting convoy schedules and offering only limited port capacity, the objective was met in every respect.

Airdrome construction—Corsica

The initial reconnaissance of existing airfields and sites for new ones was made in the early part of October 1943 while fighting was still going on and the northeastern corner of Corsica was under German control. At that time there were two existing small airfields which could be considered operational: Ajaccio and Calvi, on the west side of the island. The original airfield program called for the improvement and enlargement of these two fields. In addition, the repair, improvement, and enlargement of Ghisonaccia and Borgo on the east side and two new fair-weather sites for the Coastal Air Force were to be provided. This program was expanded to meet the important needs of the Tactical Air Force. On 10 August there were 14 operational airfields, all-weather and semi-all-weather, available for use by fighters, fighter-bombers, and medium bombers. Eighteen groups of tactical aircraft could readily be accommodated.

During early construction operations the employable aviation engineer units varied from a minimum of half a battalion to two and one-half battalions at a maximum. Higher priority airfield requirements in Italy, North Africa, and other parts of the theater prevented the assignment of additional units and retarded their early release from other projects. French units and civilian labor, supplemented by U. S. equipment and supplies, performed most of the work at Ghisonaccia and Ajaccio. Italian troops, available from November 1943 to the early part of May 1944, assisted greatly in providing needed hand labor. These troops expedited early completion of new airfields, such as Solenzara and Alesan. With these few units all work was done, including the numerous related airfield installations and projects such as removing mines; construction of radar stations and access roads to gasoline and bomb dumps and water points; elimination of bush and dry vegetation fire hazards; and erection of airfield buildings.

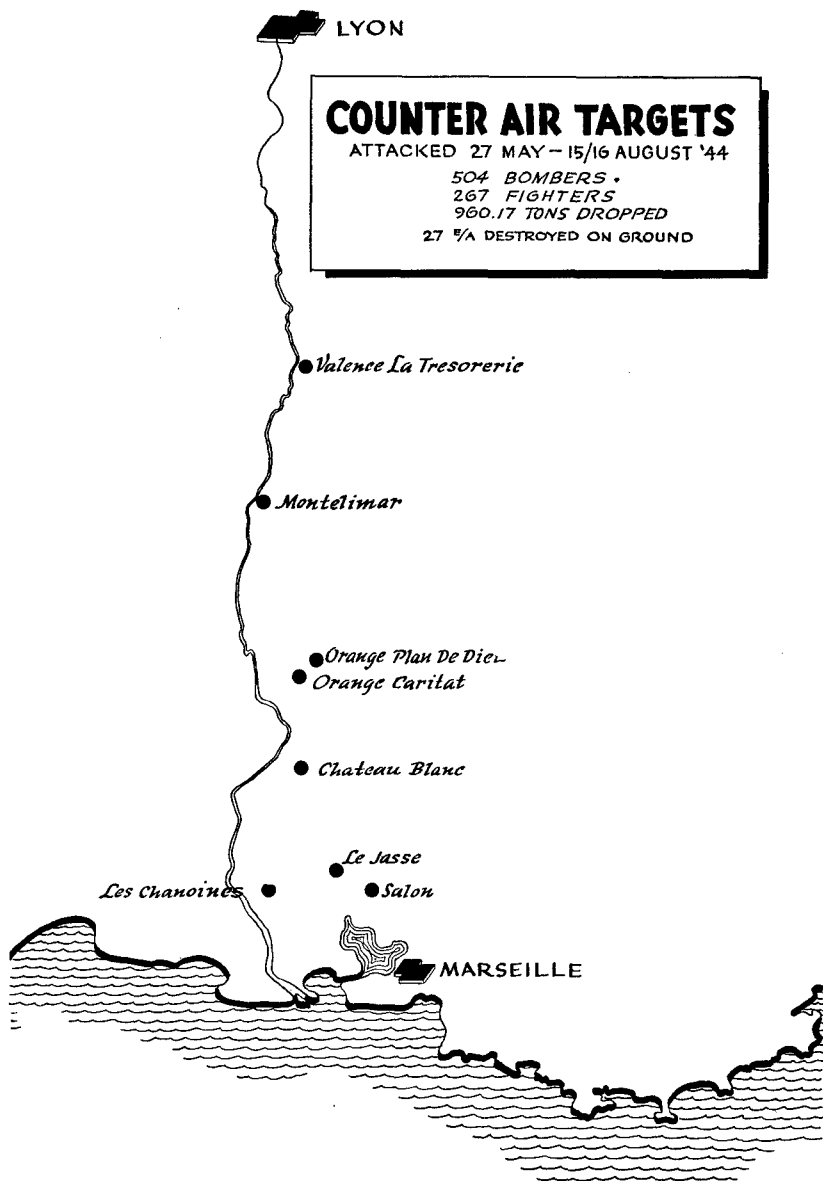
Signals

The problems faced by the Signals Planning Staff at Headquarters, MAAF involved not only the creation of a competent communications net on Corsica, but also the control of air operations from fighter direction ships during the assault phase and the speedy development of landline and radio nets in southern France. Perhaps the most interesting detail was the employment of a separate fighter direction ship, rather than use of the headquarters ship itself, to direct the assault air cooperation. The need for such a procedure was one of the major lessons learned at Anzio.

Arrangements were made with the U. S. naval commander in North African waters for headquarters and fighter direction ships and GCI-mounted LST's as follows:

Headquarters Ship	Air Sea Rescue Ship
1st Standby HQ Ship	British type 15 GCI mounted on LST
Fighter Direction Ship	32
1st Standby FD Ship	British type 8 GCI and American SCR
2d Standby FD Ship	584 mounted on LST 394
3d Standby FD Ship	

The headquarters ship arrived in Algiers on or about 20 March 1944. Representatives of the MAAF Planning Staff were invited aboard to inspect the facilities. Certain modifications were sug-



gested; the ship then proceeded to Oran, carried out the suggested modifications, returned to Algiers, and participated in the operation. FDT 13, which had been used as a fighter direction ship in the Normandy effort, arrived on or about 3 August 1944. This ship was fitted with United Kingdom communications facilities, which necessitated the changing of the antenna systems to accommodate the

MAAF theater frequencies and the provision of additional channels. These modifications were performed by XII TAC, and preliminary reports indicated that all communications functioned extremely well.

OPERATIONS

Air operations in this stab at Fortress Europe may be said to have begun as far back as 28 April 1944, when heavy bombers attacked Toulon. Between then and 10 August, when the preliminary air phase started, MAAF flew more than 6,000 sorties and dropped 12,500 tons of bombs on southern France. There was a variety of reasons for these attacks—normal anti-U-boat and anti-Luftwaffe warfare, interdiction of supply lines into Italy, and smashing French marshaling yards as direct cooperation with the Normandy thrust—but more than 25 percent of the sorties were specifically designed at the time of their execution to cooperate with the forthcoming operation. The remainder should be considered to have rendered indirect cooperation.

By far the largest share of the bombs—8,353 tons—were dropped on lines of communication, ports coming next with 2,133, then industry with 1,141, and airfields with 872. In addition to the very extensive military damage thus achieved, this long series of sporadic attacks undoubtedly helped to cloak the Allied assault plan by preventing the preliminary planned air phase from being immediately evident when it began on 10 August.

MATAF's Bombing Plan divided the offensive air operations into four phases:

Phase I—Period prior to D minus 5, discussed above

Phase II—Period D minus 5 to 0350 (B) hours D-day

Phase III—Period 0350 (B) hours D-day to H-hour (0800) D-day

Phase IV—Period thereafter

This program was issued on 4 August, by which time, of course, Phase I was nearly over. In the 5 days remaining of that period, three tasks were assigned to the air forces—*counter air operations* in the Marseille, Toulouse, and Udine areas by Strategic and in the Po Valley by Tactical; *interdiction of communications*, Strategic taking the rail line Valence-Grenoble-Montmelian-Modane and Tactical the rail bridges across the Rhone south of Valence as well as its regular operational areas in northern Italy; and finally *anti-U-boat operations*, chiefly in Toulon waters, by Strategic.

Beginning 10 August, D minus 5, a new set of assignments took priority over the three tasks of Phase I, which, however, continued to be air force responsibilities. Phase II called for the neutralization of the main coastal batteries and radar stations in the assault area and the heckling of coastal defense troops by heavy bombing without jeopardizing tactical surprise. In conjunction with the deception plan, attacks on the invasion area were to be screened by similar offensive action against identical targets in four coastal localities between Via Reggio and Beziers. By alternating and scattering the intense bombing effort among these four areas, it was hoped to maintain the fiction of a false attack and conceal the true Allied intent until about H minus 16 hours. The scale of effort needed to neutralize each of the minute targets was carefully studied and the following total effort allocated:

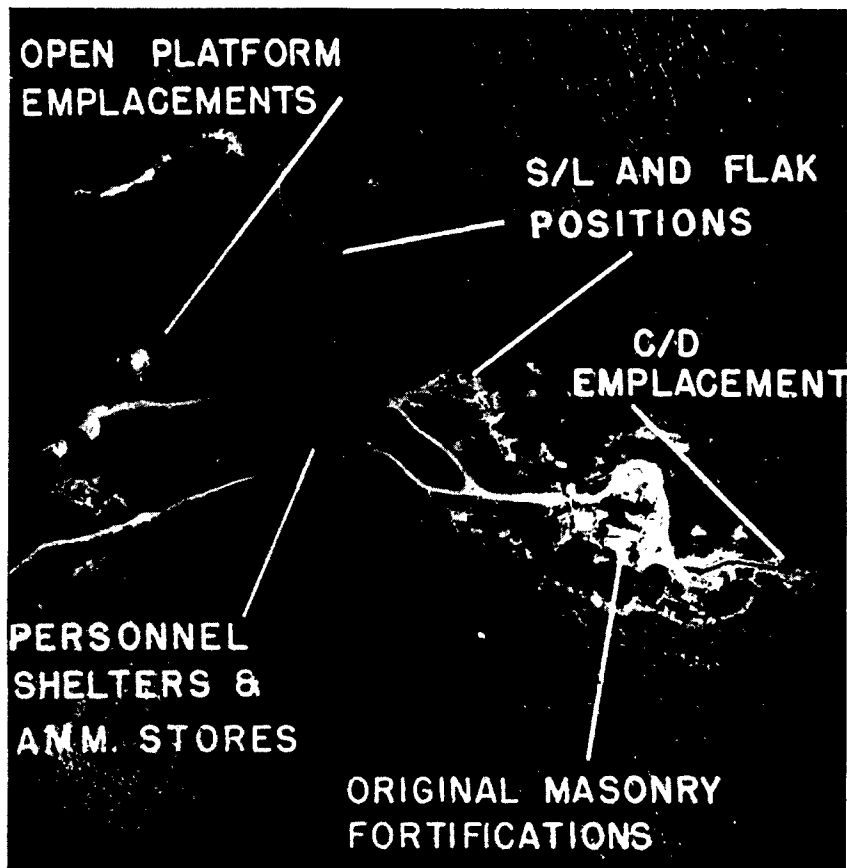
- 42 group missions, heavy bombers, plus escort fighters detailed for R. C. M. targets
- 20 night bomber sorties—MASAF
- 28 group missions, medium bombers
- 512 fighter-bomber sorties
- 12 night bomber sorties—MATAF

Weather interfered with the original schedule, but by 0350 hours D-day virtually the entire Phase II task had been completed. Effective sorties totaled 5,408, split about equally between Strategic and Tactical, while tonnage dropped totaled 6,740, of which Strategic supplied 4,451. Cost of the effort was 50 aircraft, of which 15 were heavies, 4 mediums, 2 patrol bombers, and 29 fighters or fighter-bombers.

Phase III commenced 1 hour after the conclusion of Phase II, 0350 hours D-day, and lasted the 4 hours and 10 minutes until H-hour, 0800. Its purpose—"to cause the maximum destruction to enemy coastal and beach defenses utilizing all available forces." The plan therefore allocated to the task 12 groups of escorted heavies from Strategic, both of Tactical's medium bomber wings, and the full striking power of XII TAC's fighter-bomber. The planned schedule of attack:

- 0550-0610 Small formations, each of four fighter-bombers, to patrol the assault area and silence any guns seen firing.
- 0610-0730 Small formations of heavy, medium, and fighter-bombers to carry out repeated attacks to destroy selected gun positions.

- 0635-0730 Small formations of fighter-bombers to attack selected gun positions.
- 0700-0730 Formations of medium and heavy bombers to carry out drenching attacks on the assault beaches with the object of beating down underwater obstacles and beach defenses.



COAST DEFENSE POSITION. This position, south of Hyeres, was centered around an old French underground fortification of masonry construction with a modern, lightly built, concrete pillbox type of emplacement on the extreme tip of the peninsula. This was designed as the firing position for an artillery piece on a railway mount, which could be withdrawn about 200 feet into a slot, some 20 or 30 feet deep, cut into the solid rock. North of the fort were two searchlight positions and flak installations. In a sheltered hollow on the reverse side of the promontory were extensive field fortifications, personnel shelters, and open-type emplacements for field artillery. None of the field gun positions was occupied, however, nor was the elaborate position on the tip of the promontory armed. (See attack picture on next page.)



13 COAST DEFENSE POSITION. The attack on the foregoing position south of Hyeres, shown at its height. Notice that the area occupied by personnel shelters is completely blanketed.



COAST DEFENSE POSITION. This post-attack picture shows an excellent concentration of bombs and the extensive blast damage suffered by the entire area. There was no later indication of an attempt to restore any of the damaged positions to service-ability, nor any sign that the position had been utilized to oppose a landing.



COAST DEFENSE POSITION. Convincing evidence of the way in which the attacking MASAF aircraft did their work. This destruction is typical of the entire target area. Many Italian helmets and small arms were found scattered about, but local inquiry failed to confirm the presence of an Italian garrison.

0800 onward Eight Navy fighter-bombers, eight Navy R/F fighters and 16 fighter-bombers of XII TAC to be on call to attack any remaining targets.

All aircraft were assigned rigid lanes of approach to the assault area. Bomb loadings for beach attacks were fragmentation and demolition, instantaneously fuzed, and not exceeding 260 pounds. For gun positions large demolition bombs with short delay fuzing were prescribed. Beaches were to be bombed over their whole length and to a depth of 400 yards, the pattern commencing 75 yards to seaward. To avoid damaging friendly naval craft, no beach bombing runs were allowed at an angle greater than 45° to the beachline.

Dawn of D-day found the beach area overcast. In accordance with a previously agreed plan whereby the ground forces did not wish to risk air attack by PFF methods without some visual reference points, instructions were given for this limited PFF attack. Because of this restriction demanded in the interest of safety for our surface forces, some of the heavy sorties were noneffective. Remainder used PFF technique or found an occasional hole in the cloud which permitted visual attack. A large percentage of the medium effort was likewise frustrated. All told, in Phase III, MAAF dispatched 959 sorties, of which 610 were effective. Tonnage totaled 774 and the cost was 2 heavies, 3 mediums, and 1 fighter-bomber. Despite the weather difficulties, the results achieved were highly satisfactory. The three assault divisions which hit the beaches at H-hour met virtually no resistance. Two days later the Supreme Allied Commander signaled the Air C-in-C as follows:

Please convey to the Air Forces under your command my appreciation of the bombing and fighter-bombing attacks for the operation [code word omitted] executed by them during the periods prior to D-day and on D-day itself. The Naval and Army Commanders whom I saw yesterday attribute largely their successes and small losses to the effect produced by the action of the Air Forces.

The ground attack which followed this heavy aerial preparation had two phases—sneak landings during the night of D minus 1 by Commandos and paratroops with several precise assignments, and the main assault at H-hour by three United States divisions and a glider-borne task force. The Commando and Special Service forces involved in the sneak landings had two tasks: (1) to silence batteries on the Hyeres Isles which dominated the St. Tropez beaches, and (2) to cut the one coastal highway at each end of the projected beachhead area.

This coastal road was bisected at Frejus, near the middle of the area, by a road leading from the interior down the one valley through the coastal hills. It fell to the airborne forces to bottle up this line of enemy approach by landing astride the road near the hamlet of Le Muy, some 18 miles inland.

The air plan which went into effect immediately following H-hour was in reality the normal procedure of air cooperation with ground advance. The air forces undertook three tasks: (1) To cause maximum destruction of defenses in the assault area; (2) to isolate the battlefield by destroying the remaining rail and road bridges across the Rhone and other rivers; and (3) to attack enemy troop movements. Throughout D-day Phase IV specified the participation of Strategic and the two medium wings, but thereafter only XII TAC. In consequence, D-day witnessed the mightiest air effort ever put out in a single day in the Mediterranean—4,249 effective sorties, of which 3,936 participated in the ground attack. By the end of the first week, Phase IV had been implemented by 9,646 effective sorties and 3,881 tons of bombs. Losses totaled 46 and claims were 8-1-0.

The Fifteenth Air Force had given direct assistance to the Normandy landings by bombing marshalling yards in southern France in May and June. Now, with an invasion in the south, another component of USSTAF, the Eight Air Force, was placed on call to aid the MAAF. Actually, its help was not needed, and attacks were made by the Eighth on only one day—14 August—against German airfields in the Dijon area.

By D-day Allied air supremacy was so complete that the GAF could be virtually forgotten. How impotent the Luftwaffe had become is evident in the GAF sortie figures in southern France—60 on D-day, 70 the next day. The sole German reinforcements brought up were 30 Me 109's from Italy. The fighter force still was utterly incapable of interfering with the Allies or protecting its own troops or bases. By week's end the German bomber force had to be moved back to the Lyon area. German bombing operations were attempted at dusk on the 15th through the 19th by small forces of Ju-88's against both shipping and ground targets, with inconspicuous results, although German reconnaissance undoubtedly had been successful in spotting the invasion convoys in Ajaccio harbor on the morning of the 12th.

Another measure of the success of air action was the status of German communication lines. As of D-day only one of the six railway bridges across the Rhone between Lyon and the sea was serviceable—at Avignon, where hasty repairs got one line functioning. This was the only route to the landing area from the west, for both double-track lines paralleling the Rhone between Lyon and Avignon were cut. The main Riviera line into Italy was likewise broken by bombing, while the Mount Cenis line farther north had been blocked by sabotage. At the end of the first week of the invasion, the interdiction situation was unchanged—Avignon was still the only serviceable rail line out of the area.

Best indication of all of the success of the multitudinous air operations was the swift forward rush of the Seventh Army. By week's end there was no question of the overwhelming success of the invasion. Not only had the beachhead been secured but Toulon was surrounded, Marseille almost surrounded, and armored forces, sprinting north, had reached the Rhone below Valence and were heading rapidly for Lyon. German prisoners already totaled 16,500, while total Allied casualties (as of 2400 hours, 19 Aug.) were 1,529 killed or missing and 3,491 wounded. Hard fighting continued in places, but complete conquest of southern France was obviously only a matter of time. On 21 August Lt. Gen. Jacob L. Devers, Deputy Commander of AFHQ, wrote to Lt. Gen. Ira C. Eaker, Air C-in-C as follows:

Now that we have settled down for a moment, I wish to tell you what a grand job you, Cannon, Twining, and Saville did and are continuing to do in our present effort in southern France. Your aerial preparation and later support made possible our great gains.

OPERATIONS DURING THE SECOND WEEK

The swift advance continued.

Fanning out westward and northward, the Seventh Army captured Toulon and Marseille in the westward drive, and simultaneously pushed two separate forces northward almost as far as Lyon. One of these spearheads advanced straight north to take Grenoble; the other cut across to the Rhone below Valence, then turned down the vital river to Montelimar and up it toward Lyon. Forward elements of American troops were reported on the Swiss border and

others probing eastward had come up against German defenses of the approaches to Italy through the Alpine passes. Meanwhile, French Forces of the Interior had seized Toulouse, cleared Haute Savoie, and mopped up German remnants in dozens of isolated localities. On 28 August AFHQ daily G-2 report commented:

With the capture of Montelimar by American troops yesterday evening, organized enemy resistance throughout southern France, south of a line from Grenoble to Bordeaux, has ceased, except only in the southeast corner of France, to the east of the River Var, from which 148 Infantry Division is gradually withdrawing across the Franco-Italian frontier. Very heavy losses were inflicted on the enemy in the elimination of the pocket to the south of Montelimar and it has been claimed, without confirmation, that 15,000 prisoners were captured.

Total prisoners taken through 28 August exceeded 42,000.

AIR OPERATIONS

In cooperation with the swiftly moving ground forces, Mediterranean Allied Air Forces continued to operate in accordance with the Phase IV plan. With the battle proving so easy and opposition so weak, Strategic Air Force was entirely withdrawn. The Mediterranean coast being virtually cleared of the enemy, Coastal Air Force's participation likewise was slight, totaling only 614 sorties for the seven-day period of 22 through 28 August. Virtually the whole burden of the air operation thus came to rest upon Tactical Air Force, which flew 3,299 effective sorties and dropped 1,907 tons of bombs. Fighters accounted for 2,356 of the sorties, but the medium bombers dropped 1,470 tons of the bombs. The weight of the attack was approximately evenly divided between lines of communication and enemy concentrations, the former receiving 851 tons of bombs, the latter 953.

German Air Force

Allied domination of the air was so complete that during the first week of the invasion, probably by 19 August, the few German Air Force units in southern France had decided to evacuate. The fighters which had moved in from north Italy returned to their former area, while the bomber and recon units apparently went all the way back to Germany. As a result, during the second week of the invasion there was no German air action in southern France whatsoever, except for an occasional solitary reconnaissance plane.



SUCCESSFUL COMMUNICATION TARGET ATTACK. Post-attack reconnaissance photograph shows destruction caused at Nice marshalling yard by aircraft of MAF, which pounded communication objectives from 19 May to 16 August 1944.

Interdiction

As the battle wore into its second week it became apparent, to quote MAAF Intelligence Weekly Status Report of Interdiction, that

Any further widespread destruction of rail and road communications might well be a greater disadvantage to our own swiftly advancing forces than to the retreating and partly disorganized enemy * * *. The aim of our attack on communications changed to the blocking of enemy escape routes rather than the cutting of lines of supply.

This meant chiefly that the pattern of attack switched from medium bombers hitting major bridges to fighter-bombers attacking minor road and rail bridges immediately ahead of the fleeing German forces.

Movement to France

As the front rapidly moved away from the beachhead area it became increasingly difficult throughout the week, with aircraft based in Corsica, to keep pace with the Allied advance. Allied plans for the speedy development of operational fields in France were therefore pushed hard. By week's end six fields, some of them nothing but fresh landing strips scraped from the vineyards, were operational, and substantial elements had made the shift from Corsica to the mainland. These included 3 U. S. P-47 groups, 11 RAF Spitfire squadrons, 1 RAF Spitfire TR squadron, and 1 U. S. P-51 observation squadron.

Anti-radar attacks

A preliminary estimate by the Enemy Radar Intelligence Bureau, Headquarters, MAAF of the success of the air attack against German radar stations in southern France in the period directly preceding D-day indicates that of the 22 radar sites attacked between 11 and 14 August only 5 were rendered unserviceable, with 4 more probably knocked out of commission. Notes the report: "Although this does not appear to be very satisfactory, the greatest measure of success was achieved in the most important area, from Cap Blanc to Cap d'Antibes."

Troop carrier

The success of the assault made unnecessary the original plan to drop fresh paratroops in the Maquis area on or about D plus 4. Instead, on D plus 4 orders were issued for the immediate return to the United Kingdom of the two troop carriers wings borrowed from the Ninth Air Force for the invasion.

The fourth stinging body blow had been delivered. Jerry was disorganized, desperate, confusedly retreating from a foe steadily gaining strength. Still far from beaten, never more dangerous than when cornered, he was nonetheless badly hurt.

In all humility, and with admiration for all arms which took part in the operation, it can be said that the U. S. Army Air Forces contributed in large measure to the over-all success. From General Arnold came a message of warm commendation to all AAF units which had had a hand in the proceedings.

The Commanding General's unstinted praise is to be shared by all components of the MAAF, air and ground, of whatever nationality, for their work during the 6 months preceding the invasion and during those fateful days of crashing into France from the south.

THE AIRBORNE OPERATION

SPECIAL attention is given in the following pages to the airborne aspect of the southern France invasion, as distinguished from the part played by the strategic, Tactical, and Coastal Air Forces. This more detailed description is given for two reasons:

1. Vertical warfare, a recently developed technique, is worthy of study for its possible use during later stages of the war.

2. The resounding success of this airborne operation was due to careful planning, adequate build-up and supply, and efficient execution, after formidable handicaps had been overcome.

THOUGH the ultimate success of the airborne operations was an outstanding feature of the invasion of southern France, at the time planning took place trained airborne troops and equipment were conspicuous by their absence.

In February 1944 not one available unit, airborne or troop carrier, was actually prepared for airborne operations. The 51st Troop Carrier Wing, consisting of three groups, had remained in the theater after the inactivation of the XII Troop Carrier Command. But it was the same old headache; only a portion of the wing was available for troop carrier training because of unceasing demands for troop carrier aircraft for special operations, air evacuation, and general transport chores. A few aircraft were attached intermittently to the Airborne Training Center, where a limited program of airborne training was feasible, and this training was accorded a French parachute regiment, two pathfinder platoons, and the American replacements. A British independent parachute brigade was serving in the line as infantry with the Eighth Army; an American parachute battalion and two batteries of a U. S. parachute field artillery regiment were similarly committed to the Fifth Army. No air component, no ground component—a great prospect for an airborne operation.

By May things looked brighter. Following the movement of the 51st Troop Carrier Wing from its Sicilian base to Italy, the parachute units were withdrawn from the line and given intensive training with a full troop carrier group made available in the Salerno area.

The War Department was requested to provide an airborne division for the landings. In lieu of this, several separate units were shipped to the theater. Two of these units were attached to the Airborne Training Center, then located in Sicily, for training, while a third was attached to the Fifth Army for 10 days of battle experience in the line.

Thus by the middle of June the theater had substantial airborne forces on tap. To secure the utmost cohesion, it was decided to move the Airborne Training Center with its attached units, as well as the troop carrier aircraft—now increased to two full groups of the 51st

Troop Carrier Wing—to the Rome area. Here was established a compact forward base for all our airborne forces.

ORGANIZATION

Airborne elements

Toward the first of July the plans for the operation were firmed, including the use of a provisional airborne division made up of the usable units in the theater. Maj. Gen. (then Brig. Gen.) Robert T. Frederick, formerly commander of the First Special Service Force and later commander of the 45th Infantry Division, assumed command of the composite force. Certain units on the troop list were earmarked as additional supporting units to organize a balanced airborne force, and authority was requested of the War Department to activate those units not authorized on the theater troop list. By 7 July initial instructions relative to the Provisional Airborne Division were issued to General Frederick.

The division was then given a 5 percent overstrength in personnel by the assignment of parachute filler replacements from the Airborne Training Center. Meanwhile, activation was completed of the divisional headquarters and headquarters company, two additional batteries of field artillery, an airborne signal company, and an antitank company. Because D-day was racing toward them like the end of a runway, it was decided not to attempt to prepare the antitank company for the operation, since a Japanese-American company was at hand.

Qualified airborne officers were scarce. As the result of a request for personnel for General Frederick's staff, 36 staff officers arrived in the theater toward the middle of July. Most of them had come from the 13th Airborne Division and a few from the Airborne Center, Camp Mackall, N. C.

For employment in the preparatory stage but not in the operation itself, detachments from a signal operating company, a quartermaster truck company, and some 400 replacements from the Airborne Training Center were placed at General Frederick's disposal.

Troop carrier elements

By the middle of July the 51st Troop Carrier Wing could use two groups for airborne operations; the third was occupied with special duties. To implement the operation, Allied Force Headquarters

called for additional troop carrier groups and a minimum of 450 aircraft. On 10 July 1944 orders were issued placing the 50th and 53d Troop Carrier Wings of the IX Troop Carrier Command, then in the United Kingdom, on temporary duty in the theater. Each wing had four groups of three squadrons, reinforced by self-sustaining administrative and maintenance echelons and by IX Troop Carrier Command Pathfinder Unit, a total of 413 aircraft. In addition to the personnel and equipment moved by organic aircraft, the Air Transport Command transported a medical evacuation squadron, various signal detachments, assorted parapack equipment, and 375 organic glider pilots. Made in eight echelons via Gibraltar and Marrakech, the move required only 2 days, two aircraft being lost en route. Maj. Gen. Paul L. Williams, commanding the two wings from the United Kingdom, arrived on 16 July and activated the Provisional Troop Carrier Air Division, which had all its units stationed at their designated airfields by 20 July, ready to carry out their missions.

With only some 130 operational CG-4A and 50 Horsa gliders to draw on, rapid steps were taken to get enough for the operation. Fortunately, a previous requisition for 350 Waco gliders from the United States had been made; it was necessary only to expedite this request. The British airborne forces had sufficient Horsa gliders to provide for their brigade group. The shipment from America duly arrived and the gliders were assembled in jig time, being readied 10 days before D-day. To provide for two pilots for each glider, 350 additional pilots arrived from Britain. By special air and water transport, some 600,000 pounds of cargo parachutes and aerial delivery equipment arrived in time for the operation, the last large shipment being received on D minus 4.

Concentration of units

A compact airborne base had been organized by the Airborne Training Center and the 51st Troop Carrier Wing at Ciampino and Lido de Roma airfields in the Rome area. By 3 July an advance echelon of the Airborne Training Center was established at Ciampino airfield, and by 10 July the center, with its attached units, a parachute battalion and a glider infantry battalion, was completely located there. Since the divisional staff ordered for General Frederick could not arrive until about 15 July, all other American airborne units in the theater were attached to the Airborne Training Center so that its staff could

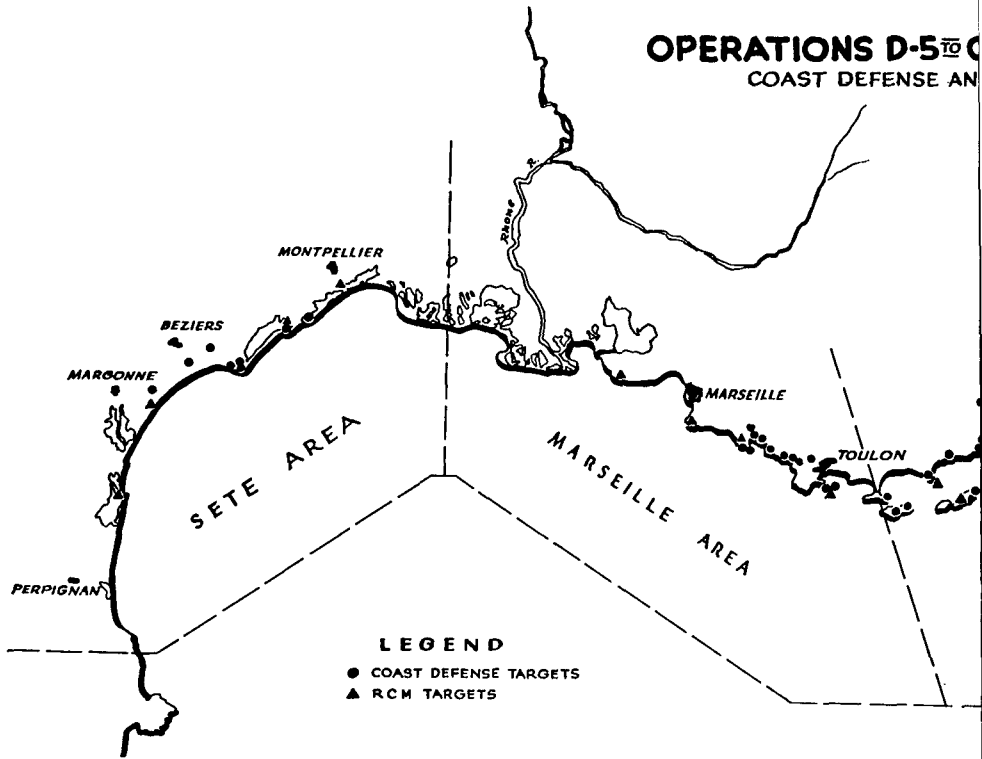
help to concentrate the airborne troops. Ordered out of the Fifth Army line, the parachute regimental combat team arrived 5 July. Various supporting arms and services placed at the disposal of the Provisional Airborne Division were attached to the Airborne Training Center for instructions. By 17 July General Frederick had moved his headquarters to Lido de Roma airfield, and on 21 July he requested that the name of his provisional organization be changed to "First Airborne Task Force," the use of the term "division" being a misnomer. The Commanding General, Seventh Army concurred and redesignated the unit accordingly.

PLANNING

Tentative plans had been in the making for some time, but no final detailed pattern for the airborne operation was possible until the First Airborne Task Force and the Provisional Troop Carrier Air Division were organized and ready to function, which brought affairs almost to 20 July. On his arrival the Commanding General, Provisional Troop Carrier Air Division approved the suggested plan of using the previously selected take-off fields, at Ciampino, Galera, Marcigliano, Fabrisi, Viterbo, Tarquinia, Voltone, Montalto, Canino, Orbetello, Ombrone, Grosseto, Fallonica, and Piombino. Subsequently the Provisional Troop Carrier Air Division undertook primarily the planning and coordinating aspects of the operation, involving timing, routes, corridors, rendezvous, and traffic patterns. In general, planning for the selection of drop zones and landing zones and the composition of lifts was left to the airborne and troop carrier units involved.

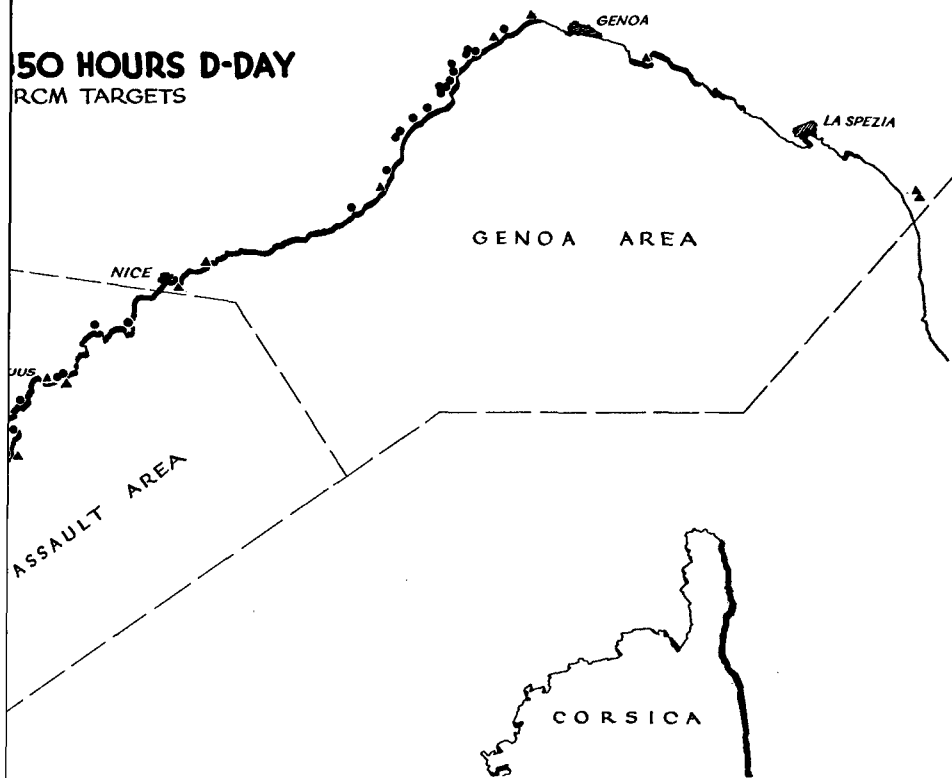
It was first decided that a predusk airborne assault on D minus 1 should not be made, as this might jeopardize the success of the entire operation. Second, it was concluded that it would be neither necessary nor advisable to launch the initial vertical attack after the amphibious assault had begun. The latter decision was reached in view of the wide experience of our troop carrier crews in night take-off operations, and because of the marked improvement in pathfinder technique. Consequently the basic plan called for a predawn assault. One plan, contemplating an immediate staging in Corsica, was rejected because of lack of Corsican airfields, and also because the few available were located on the eastern side of the island, necessitating a flight over 9,000-foot mountain peaks. A further consideration was

OPERATIONS D-5 TO C COAST DEFENSE AND



that such an intermediate staging would require that the airborne corridor be established south of the main naval channel, entailing a dogleg course for the flight.

From numerous conferences the rough plan emerged and was approved about 25 July 1944, calling for the use of the equivalent of an airborne division beginning with the first dropping to be by airborne pathfinder crews at 0323 on D-day. The main parachute lift of 396 plane-loads was to follow, starting at 0412 hours and ending at 0509 hours. The follow-up glider landings, composed of 38 Waco and Horsa gliders, were to take place at 0814 hours and continue until 0822 hours. Later in the same day a total of 42 paratroop plane-loads was to be dropped, followed by 335 Waco gliders, starting at 1810 hours and ending at 1859 hours. The automatic air resupply, originally designed as a part of the D-day late afternoon mission, was postponed because insufficient troop carrier aircraft were obtainable and because the Troop Carrier Command could not drop supplies from aircraft towing gliders in the afternoon glider lift. The final



plan provided that 112 plane-loads were to be brought in automatically on D plus 1. The rest of the supplies were to be packed and held for emergency use under Seventh Army control. The troop carrier route was carefully chosen after due consideration of the following factors:

1. Shortest feasible distance
2. Prominent terrain features
3. Traffic control for the 10 troop carrier groups
4. Naval convoy routes
5. Position of assault beaches
6. Primary aerial targets
7. Enemy radar installations
8. Avoidance of excessive doglegs
9. Prominent landfalls
10. Position of charted enemy flak installations

This route logically followed the Italian coast generally from the Rome area to the island of Elba, the first overwater check point, continuing to the northern tip of Corsica and proceeding on an azimuth course over naval craft check points to the landfall, just north

of Frejus at Agay. Complete coordination was established with the Navy on the position of this corridor, and detailed information concerning it was widely disseminated among naval forces.

Because of high terrain features in the target area, it was decided to drop the paratroops and release the gliders at exceptionally high altitudes, varying from 1,500 to 2,000 feet. Towed glider speeds were set at 120 m.p.h. and dropping speed at 110. The formation adopted for the parachute columns was the universal "V of V's" of 9 ships, in serials of 45 aircraft, each with 5-minute intervals head to head between serials. The glider columns adopted a "pair of pairs" formation, echeloned to the right rear with 1,000 feet between pairs in column. Serials made up of 48 aircraft towing gliders in trail were used with 8-minute intervals between serial lead aircraft. Parachute aircraft employed a maximum payload of 5,430 pounds; Horsa gliders, 6,900 pounds; CG-4A (Waco) gliders, 3,750 pounds.

Maps and models were hard to get, which made planning difficult. Map shipments were late or faultily made up. There were terrain models on a scale of 1:100,000, but the most useful terrain model, a photo-model on a scale of 1:25,000, could be had only in one copy, which could not serve both the Provisional Troop Carrier Division and the First Airborne Task Force. The original coastal obliques were of little use, since the run-in from the IP (first landfall) was not adequately covered. The blown-up large scale photographs of the dropping zone and landing zone areas were excellent, but they arrived too late for general use. (These late photographs uncovered the element of antiglider poles installed at the landing zones, not revealed by any previous photographs.)

PREOPERATION TRAINING

By the middle of July, nearly all the airborne units to be employed in the operation had been assembled in the Rome area. An intensive final training program had been instituted by the First Airborne Task Force in conjunction with the Airborne Training Center. Of the airborne units to be used, only one parachute battalion and a British parachute brigade had received any recent combined airborne training with the troop carriers. The regimental combat team had just come out of the line with the Fifth Army, as had the parachute field artillery battalion. Other units had but recently arrived overseas and had

been given a course in ground and refresher training at the Airborne Training Center.

Particularly urgent was the task of training the newly organized glider-borne troops. A combined glider school was established and instruction in loading and lashing for these troops was started. Upon completion of the course, they were given orientation flights and finally one skeletonized, practice operational landing on a simulated LZ.

The Pathfinder Unit of the Provisional Troop Carrier Air Division conducted joint training with the three airborne pathfinder platoons and tested the radar and radio aids to be used in the operation. This training was divided into three phases, the first being concerned with the technical training with Eureka sets, M/F beacons, lights, and panels. Tests were made to locate any deficiencies in either the training or the apparatus. The second phase was devoted to practice by the crews in using the equipment under all possible conditions. The third phase emphasized actual drops with full equipment in which every attempt was made toward the utmost realism. Small groups of follow-up parachute troops were dropped on the prepared drop zones to test the accuracy of pathfinder aids.

Difficulty in repacking the parachutes in time for the operation precluded the staging of realistic, large-scale final exercises. However, practice drops were made with two or three men representing a full "stick" of paratroops, with the remaining elements placed in the DZ's to practice assembly. There was just time to squeeze in a combined training exercise with the Navy, in which all vessels carrying waterborne navigational aids were placed in their proper relative positions. A token force of three aircraft per serial was flown by all serial leaders over these aids, observing exact time schedules, routes, and altitudes. Two serials of 36 aircraft each were flown over this same route during daylight to acquaint the naval forces with troop-carrier formations. Further practice runs were made by the troop carriers in conjunction with two fighter groups in order to work out the details of the fighter cover plan and the air-sea rescue plan.

Because the task force was composed of units which had not previously worked together, training of combat teams was further accentuated for successful operations after landing. Training of each combat team was conducted on terrain carefully selected to duplicate

as nearly as possible the combat team's sector in the target area. From the regular replacement depots and the Airborne Training Center were drawn the specialized personnel required, who had then to be specifically trained for their assigned tasks. Fortunately the larger elements of the command, particularly the combat teams, were trained already. Some were battle-seasoned and nearly all were capable of looking out for themselves in a pinch. Thus they could aid the Airborne Task Force as a whole during the training period.

THE OPERATION

The night of D minus 1 was clear and cool in the take-off areas. The troop carrier units waited at their stations on 10 airfields extending some 150 miles along the Italian peninsula from Ciampino near Rome to Fallonica. Lack of transportation had compelled the bulk of the force to commence moving to dispersal airfields as early as



TROOP CARRIER FORMATION. C-47's in formation during one of the daylight drops on southern France. This is the universal V of V's formation referred to in the text.

D minus 5. By D minus 2 the shift had been completed. Now, with preparations complete, an air of confident expectancy prevailed.

Anxiously the weather was watched. The date had been unalterably set for 15 August, and weather meant everything. Hill masses and coastal features must be readily identified. A portion of a high pressure area, broken off from its North Sea center, had settled over the main target zone, with its threat of accumulating fog or stratus. The forecast was for clear weather to Elba, followed by decreasing visibility until the DZ's were reached, where it was expected to be 2 to 3 miles. Actually the visibility was less than half a mile. The valley fog, which completely blanketed the early parachute operation, did however lift by 0800 hours in time for the morning glider mission. To make navigation difficulties tougher, the wind was almost 90° off the forecast direction, and infrequent check points over the water route were the navigators' only means of correction. Luckily, the wind did not reach high velocity and was less than 6 m.p.h. over the DZ.

Shortly after midnight of 14-15 August the real show began. With everything ready for the green light, the first troop carriers with their load of three pathfinder units took off at 0030. The pathfinder platoons proceeded as a group on a direct line to southern France, making their first landfall just south of Cannes. With PPI sets in all aircraft, the pathfinders proceeded inland as planned, located the drop zones, and dropped their teams at 0323, 0330, and 0334 hours respectively, on DZ's, "O", "A", and "C".

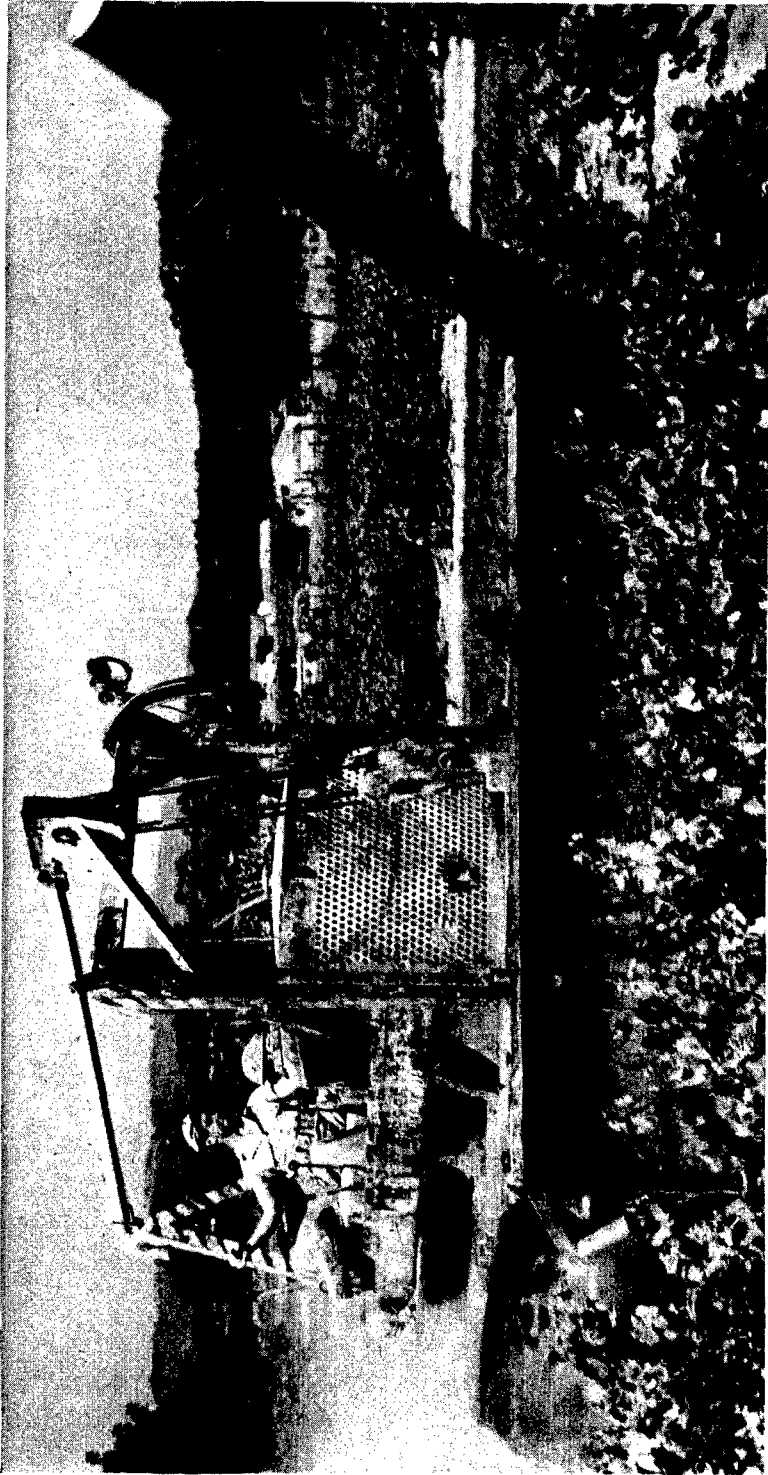
Approximately 1 hour after the pathfinders, the main parachute lift, composed of 306 aircraft in 9 serials averaging 45 aircraft each, took off and proceeded on their courses, using amber downward recognition lights until the final water check point had been crossed. Wing formation lights were also employed, and no instance of friendly naval fire on our planes was reported. No enemy aircraft was encountered. Of particular interest is the fact that some 400 troop carrier aircraft flew in relatively tight formation, under operational strain, for some 500 miles without accident. Training in night formation flying had paid off.

Undoubtedly the radar, radio, and other marker installations were responsible for this flying accuracy. Eureka's had been installed at each wing departure point, the command departure point, the northeast tip of Elba, Giroglia Island (North Corsica), and on three

marker beacon boats spaced 30 miles apart on the course from Corsica to the first landfall check point at Agay, France. These worked perfectly, with an average reception of 25 miles. Holophane lights, also placed at these positions, aided the navigators to correct their courses against contrary wind currents. Their reception averaged 8 miles until the DZ's were reached, when haze and ground fog made them invisible. MF beacons (the Radio Compass Homing Devices) were installed at Elba, on North Corsica, and on the center marker beacon boat, and were also dropped on the DZ's along with the Eureka and Holophane lights. Many pilots reported that they received these signals up to 30 miles. The MF beacons often kept the aircraft on beam when they occasionally lost the Rebecca signal on their Eureka's. In many cases, the Rebecca signals exhibited a tendency to drift off the frequency despite constant operational checking. Such evident functional defects in Eureka-Rebecca sets may jeopardize a whole mission.

In general, the parachute drop was fully successful. Approximately 85 percent, a far larger proportion than had been accomplished in previous operations in the European theater, landed on the DZ's or in their immediate vicinity, in areas contiguous to the drop zones, from which terrain the parachute forces could carry out their assigned missions. All this was despite the handicaps of no moon, general haze, and heavy ground fog. An estimated 45 aircraft completely missed their DZ's. Some of these dropped their troops as far as 20 miles from the selected areas.

Among the aircraft which missed the DZ's were 20 in Serial No. 8, which released their troopers prematurely on the red light signal. The only likely explanation is that a faulty light mechanism in one of the leading craft must have gone on green prematurely and the troops in the lead ship jumped according to this signal. The troops in the following airplanes, seeing those in the leader jump, probably did likewise, jumping while the signal in their own aircraft showed red. Two "sticks" of paratroops landed in the sea off St. Tropez, near Cannes. The remainder made ground landings in the vicinity of these two towns. Although far from the designated DZ, these units organized themselves, made contact with the FFI forces, and proceeded to seize and hold St. Tropez. Approximately 25 aircraft of another group which missed their DZ dropped their troops some 15



CLEARING ANTIGLIDER OBSTACLES. An American bulldozer bowls over one of the numerous antiglider poles installed in a French vineyard in anticipation of the southern France invasion.

miles north of Le Muy near Fayance. Although about 20 miles away from where they belonged, they either undertook individual missions or sought to rejoin their units. By evening of D-day, most of these forces were reassembled on DZ's "A" and "O". Many high-ranking staff members were in this group.

During the drop, DZ "A", generally west of Le Muy, tended to merge with DZ "O", slightly northwest of this key town in the Vargennes Valley, causing considerable confusion later in the day. This accidental merging of the two zones created difficulty during the period of bundle recovery, difficulty which was aggravated because the British Parachute Brigade on DZ "O" was using equipment different from that of the U. S. Regimental Combat Team on DZ "A".

The terrain of the DZ's was generally excellent. Both zones covered an area of small, cultivated farms featuring vineyards and orchards. There were very few large buildings, telephone wires, tall trees, or other formidable obstacles. The anti-airborne poles set up in the zones had not been sharpened or placed in sufficient density to offer any material obstruction. Probably not more than a squad suffered any injury from these hazards. A total of 175 paratroops, scarcely more than 2 percent, suffered jump casualties. Probably not more than 100 of these were breaks or sprains serious enough to take the men out of action for any considerable time. DZ "C" was a hill mass more rugged than the other zones, but even this rougher ground did not mar the jump's success.

Serial No. 14, first of the glider serials, made up of supporting artillery and antitank weapons for the British Parachute Brigade, left as scheduled for its 0822 landing but was recalled because of heavy overcast. The flight, after circling for nearly 40 minutes, landed at 0900 hours. One glider and tug had to turn back. One glider ditched offshore and another, because of structural defects, disintegrated in mid-air. The stakes that bristled all over the LZ's proved minor obstacles, though they did some damage to the gliders and occasionally to their loads. Small, shallowly planted, and too widely dispersed, the poles frequently served as additional braking power. The French farmers who had been impressed as labor for planting the poles had not served their German masters very efficiently. On an average these poles were 12 feet high and 6 inches

thick, driven less than 2 feet into the ground and spaced 30 to 40 feet apart.

The parachute load made up of the 551st Parachute Battalion dropped accurately on DZ "A" at 1800 hours as planned. This drop was followed up rapidly by continuous glider serials. Nine gliders were reported to have been released prematurely, four of which made water landings. Prompt action by the Navy saved a large percentage of their crews and personnel. The landing skill of our glider pilots was highly satisfactory; although the 1,000-foot towing interval caused considerable jamming over the LZ's, they made excellent landings. Several pilots even ground-looped to avoid obstacles and still brought in their cargoes and personnel safely.

Another reason for crowding over the landing zones was that part of the successive flights sought additional altitude as a result of the normal "accordion movement" of the flights en route. In turn this progressively caused a layer effect which resulted in a greater mass of aircraft being over the LZ's at any one time than had been anticipated. Further difficulty was caused by early glider pilots landing on the best and most obvious sections instead of in their designated localities. Later lifts found their assigned areas almost entirely occupied with gliders, which forced them to seek alternate and less desirable zones. All these factors caused many heavy and short landings which seriously damaged large numbers of gliders. The pilots simply had to dig in on their landings because of limited space. Although these abrupt, heavy landings caused excessive damage to the gliders, the pilots by presence of mind, prompt action, and skillful maneuvers saved many lives and much valuable equipment. It was established by D plus 6 that not more than 125 glider-borne personnel were injured in these landings.

Although not encountered in the operation, it is worthy of note that in the Frejus area, outside the drop zones, there was a second type of antiglider obstacle which consisted of small but sturdy sharpened stakes, some 18 inches high, firmly imbedded in the ground and connected by wire, which could easily tear up the bellies of any gliders landing on such terrain.

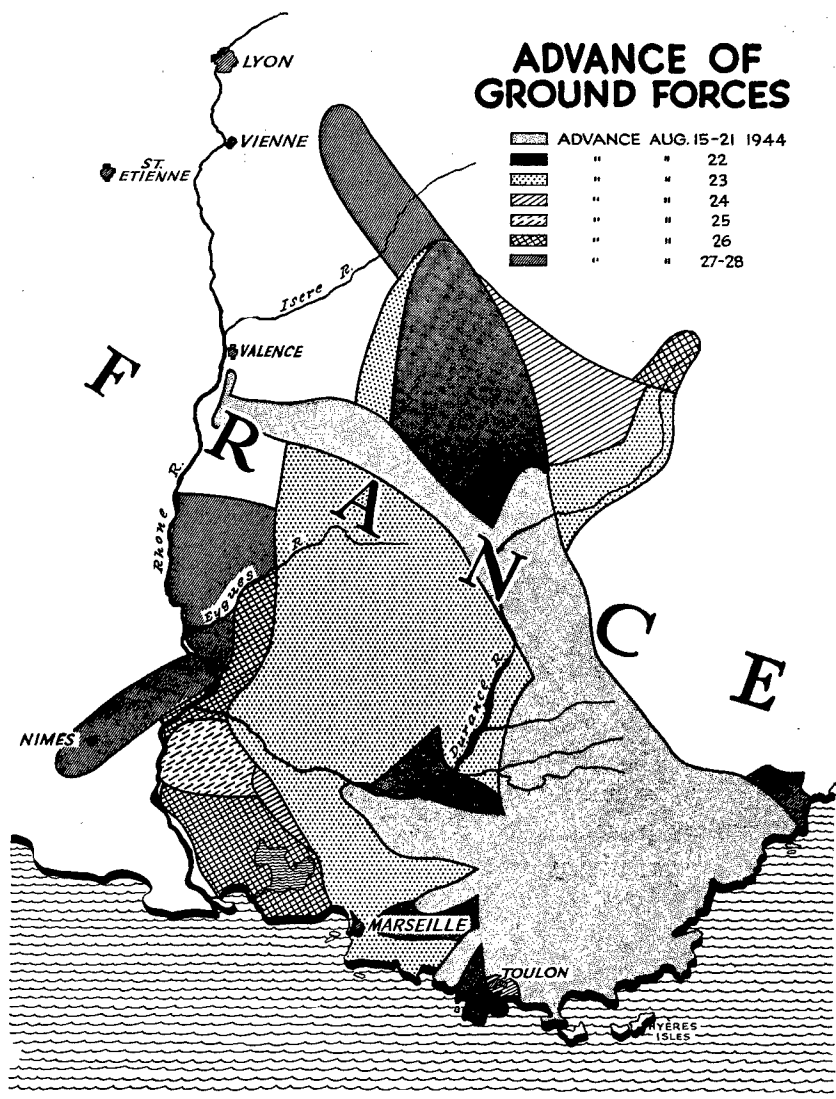
Less urgent than had been expected was the problem of air resupply. Absence of serious enemy opposition caused ammunition expendi-

ture to fall below the anticipated amount. The initial plan of bringing in the first supplies by air on D-day was changed, so that it was not until 1000 hours on D plus 1 that two troop carrier groups brought in 116 aircraft loaded with supplies. They arrived over the DZ's on schedule but at an altitude well over 2,000 feet, which made accurate dropping extremely difficult. A rather stiff breeze, the high altitude, and the merging of DZ's "O" and "A" placed much of the equipment in the hands of the wrong ground units. Well over 95 percent of the 1,700-odd bundles dropped by parachute landed safely, but much of the specialized equipment failed to reach the units which had requested it. Subsequent missions carrying emergency medical and signal supplies were flown again on the night of D plus 1. Although these drops had to be made at night by pathfinder aids, the success of these missions was above average, except that again the high altitude caused excessive scattering.

GROUND ACTIVITIES

The enemy didn't put up much ground opposition.

More difficult to take than the average objective was Le Muy. The main bridge leading into town was captured well ahead of schedule late on D-day by the British Parachute Brigade, but the town itself was not taken until the morning of D plus 1, as the D-day attack failed to seize the objective and an American glider infantry battalion was later ordered to attack and occupy the town, which was accomplished. The force quickly took Le Mitan, La Motte, Castron, and Les Serres by noon of D-day. Contact was promptly made as planned with the 45th and 36th Infantry Divisions. Elements of one regimental combat team, together with a parachute battalion, took Draguignan, while another parachute battalion assisted the amphibious landing by extending detachments down to the beach following their early landing. Most of the howitzers of the field artillery battalions were functioning shortly after the drop. Similarly, the 4.2 mortar companies and a pack artillery battalion, which came in with gliders, went into action very promptly. The operation was a great boost for parachute field artillery. Almost all the howitzers were in position and firing by noon of D-day, and all were ready for action by dark. With a parachute battalion isolated and inaccessible by road, no other type of artillery could have supported it. The surprise



achieved by the landings and the cutting of communication lines by the airborne forces prevented proper employment of enemy mobile reserves, as attested to by the captured general commanding the German corps.

By 18 August the force had commenced to reorganize in the vicinity of Le Muy, following which it proceeded along the Riviera toward Cannes, Nice, and the Italian border. The British Parachute Brigade was taken out of action and preparations were made to return it to its

base in the Rome area for further possible airborne operational use. The First Special Service Force replaced the British brigade, and the Airborne Task Force then continued to advance along the coast, meeting determined rear-guard opposition. These operations of the Task Force toward the Franco-Italian border were not restricted to the coast, but extended to a point about 65 miles inland. As has always been the case when airborne troops are retained in the line in an offensive role, they experienced backbreaking difficulty in transporting their heavy supporting arms and ammunition. The fluid, rapid advance of the Seventh Army as a whole made it hard to provide the necessary vehicles for the force. As a result, the paratroopers in many cases hauled their pack 75's for 60 or 70 miles over the rugged Riviera coastline. Fortunately a number of captured enemy vehicles, together with organic transport brought in by gliders, made the movement possible.

The hostile activity encountered was at no time sufficiently stern to test the full fighting capabilities of the force.

STATISTICS

During the operation the Provisional Troop Carrier Air Division flew 987 sorties and carried 9,000 airborne personnel, 221 jeeps, and 213 artillery pieces. The sorties flown also included 407 towed gliders and carried 2,365,254 pounds of equipment into the battle area for the First Airborne Task Force. Only 1 aircraft was lost as a result of the operation itself, and losses from the period of movement from the United Kingdom to the close of the operation totaled 9. No troop carrier personnel other than glider pilots were known to have been killed; 4 were listed as missing and 16 were hospitalized. The balance of the 746 dispatched on the operation returned to their organization.

With respect to airborne units, a total of 434 United States airborne personnel were listed as killed, captured, or missing in action by 20 August. In addition 292 were hospitalized. Early reports indicated that the British Parachute Brigade listed 181 men as missing in action and 130 men hospitalized. Later reports indicated that 52 parachute troops of the British brigade had definitely been killed. Five hundred replacements had been requested by the United States parachute units and 126 by the British brigade. In the first 2 days of action,

more than 1,000 prisoners had been taken by the American units and nearly 350 by the British brigade. By 23 August, this figure was well over 2,000. The total jump and glider crash injuries amounted to 283, or approximately 3 percent of the personnel involved.

Recovery of parachutes for personnel and cargo can be expected to be very low. As of 1 September, it was apparent that not more than 1,000 parachutes could be sent to the Rome base for salvage and repair. Similarly, the number of gliders which can be used again is always small. It was learned that fewer than 50 gliders of the 407 could be salvaged without excessive cost.

SUMMARY

Without doubt, this airborne operation was the most successful attempted up to that time in the European theater. The commanders of both the airborne and the troop carrier units and their subordinates deserve full credit for their excellent execution of the mission. The results and experiences of this operation are believed to be of value to all theaters in avoiding mistakes and improving techniques.

MAPPING AND RECONNAISSANCE

Mapping of southern France by the Mediterranean Allied Photographic Reconnaissance Wing (MAPRW), then the North African Photographic Reconnaissance Wing, began in July 1943. At that time the 15th Photographic Squadron (Heavy), a unit under the 3d Photographic Group, moved from Le Khraub airdrome, Constantine, where it was doing routine cover and mapping of Sardinia and Corsica for the North African Strategic Air Force, to La Marsa airfield in Tunisia. Here the squadron was assigned the task of mapping the Po River Valley, Albania, Yugoslavia, and southern France. A partial 6-inch and 24-inch cover was begun on southern France at that time.

During the fall of 1943, some survey mapping was accomplished in the South France coastal areas. A careful check of existing maps against these photographs proved the maps to be inaccurate, outdated, and definitely unsuitable for combat use. Cloudy, winter weather made continuous photography impossible. During these months, however, more serious attention was given to the possibility of an Allied attack in this area, and a planning staff, Force 163, was assigned to the task.



AMERICAN PARATROOPS DROP ON SOUTHERN FRANCE. A daylight drop of assaulting Yank paratroops on carefully chosen drop zones in southern France.

At a conference between officials of Force 163 and the commanding officer of MAPRW, it was decided to assign to the 23d Photographic Reconnaissance Squadron the work of providing the required cover. On 2 February 1944 the unit moved to Alghero, Sardinia, ready to begin the work, and on 16 February 1944 a liaison officer arrived in Sardinia to coordinate matters between the 23d Squadron and Force 163. The first mission to be flown from the island was delayed by weather conditions until 15 February.

The project of covering southern France was broken down into several divisions. Phase one called for the completion of the original survey (6-inch) mapping in an area bounded by the Italian border on the east, Toulouse on the west, and 44° latitude on the north. Simultaneously, more survey mapping was to be accomplished in the block bounded by the Italian border, 3° longitude, and 46° latitude. In addition, detailed coverage was to be provided of points of military interest within the latter area. Phase two required that certain lines of communication should be covered in detail. Also to be accomplished was the detailed, 24-inch mapping of the area north from the coast to the city of Orange. The east and west boundaries of this area approximated those of Block 1, Phase 1. Certain repetitious cover, including 36-inch photography, was provided as the schedule required. Many attempts on the part of the 23d Squadron to mount satisfactorily the 36-inch camera in an F-5 type airplane met with failure, and an aircraft was borrowed from 682 Squadron, Royal Air Force, MAPRW to accomplish this work. Completion of the basic program permitted publication of accurate tactical maps of all areas named.

With this information in hand, definite plans began to appear. Interested army units asked questions which appeared in the form of specific demands, forwarded to the unit through the operations officer at MAPRW Headquarters. One question asked, for example, was: "Where would be suitable location for the landing of paratroops and other airborne units?" That was answered by photographs. The Strategic Air Force became interested in manufacturing centers, roads and railroads, marshalling yards, and similar targets; the Tactical Air Force in bridges, dams, and road junctions. Target charts were made of each desired pinpoint, and strips were flown of lines of communications.

The question of the selection of the proper beaches for the landing of troops was brought forward. Experiments by the squadron had made color photography a thing of tactical value, and this latest development was added to the preparation. A study of water depth and underwater obstacles was also accomplished through the medium of aerial photography. Strategy demanded a photo map of a definite area, so a 12-inch focal length mosaic was produced. More detailed information of a beach section was required and the squadron produced 40-inch focal length photographs. It might be noted that while these photographs were acceptable, the definition was not so clear as would be desired. However, that much had been accomplished. Closer view of beaches and other points were required. Consequently low altitude or dicing missions were flown of these areas. The work of the squadron in this regard was more successful than were the experiments with color photography. After much experimenting and remodeling, three 12-inch focal length cameras, two side obliques and one forward-pointed oblique, were installed in an F-5 and successful missions were flown. A shield was devised for the forward camera port to prevent salt spray from obscuring the lens. The resultant photographs possessed detail and clarity and were of important service.

In addition to the preceding assignments, periodic cover was required of airdromes, harbors, and marshalling yards for the purpose of keeping a close check on enemy activity. Several times during the winter and spring of 1944 bomb damage assessment sorties were flown.

From the schedule outlined, it was obvious that one squadron could not hope to complete the necessary work in the required time. Other units, therefore, were attached to the 23d Squadron for operational purposes, to assist in obtaining the essential cover the 2/33d Squadron, French Air Force, MAPRW covered the northern sector of the survey mapping and photographed some of the enemy lines of communication. A flight from 682 Squadron, Royal Air Force, MAPRW photographed most of the roads and many of the target chart areas.

Enemy opposition to photo operations steadily increased over southern France. Weather conditions were another hampering factor. The actual flying itself demanded skill and accuracy beyond normal requirements. Other troubles introduced themselves. For

instance, on one flight a pilot discovered intervalometer trouble in his camera but continued on course, taking pictures manually with such a degree of skill that the photo interpreters were unaware of the mechanical failure.

Flying and aerial photography by no means sums up the work of the 23d PRS organization. Each mission was plotted by members of the unit, and first phase interpretation was given of all suitable targets. The squadron's photographic laboratory processed over a half million prints for this operation alone, some of which were turned out in such record time that immediate use was made of certain sorties. Members of the engineering and camera technician staffs introduced variations and inventions which improved the quality of the photographs and the serviceability of the aircraft. The close cooperation which existed between communications, operations, and intelligence permitted the flying of all new demands and the return of the information to the demander in record time. The ground echelon's efficiency is demonstrated in the fact that the base of operations was changed in the middle of the preliminary operation, without the loss of a single flight. In spite of the move, a full day's operation was carried out. The move took place on 12-17 July 1944 when the squadron left Alghero, Sardinia, for Borgo Airfield near Bastia, Corsica.

In preparation for the Seventh Army operation, the 3d Photographic Group, including group headquarters proper and the 5th Combat Mapping Squadron, moved to Borgo Airdrome, Corsica, 12-18 July 1944. The 5th Combat Mapping Squadron, from its new location, continued bomb damage assessment cover for the Tactical Air Force, while the 23d Squadron was assigned to tactical reconnaissance for the Seventh Army. A detachment of the 23d Squadron was assigned to the Seventh Army to go into southern France with the first forces, while the remainder of the squadron was scheduled to go in on D plus 4 and D plus 11.

A first and second phase and bomb damage interpretation section, set up in 3d Photo Group headquarters, began to operate entirely for the Tactical Air Force. TAF headquarters, located only a few miles away, made speedy requests and coordination possible. Sorties flown in the morning and early afternoon were processed immediately by the laboratories, and by late afternoon the interpreters began to send out their reports.

THE AIR COMMAND POST AFLOAT

Offensive air activity during the invasion was scheduled and controlled from the U. S. S. *Catoctin*, Amphibious Force flagship for the over-all operation. Here XII Tactical Air Command (Advance) operated, charged with air protection of the Fleet and the beaches in the assault area, as well as with the continuation of its fighter-bomber and reconnaissance work against enemy ground forces. Its aircraft were based in Corsica, 150 miles away.

The *Catoctin* was a stand-by fighter direction ship for air defense. FDT No. 13 (fighter direction tender), a British LST, was responsible for control of defensive fighters on patrol over the assault area. HMS *Ulster Queen* was another stand-by fighter direction ship.

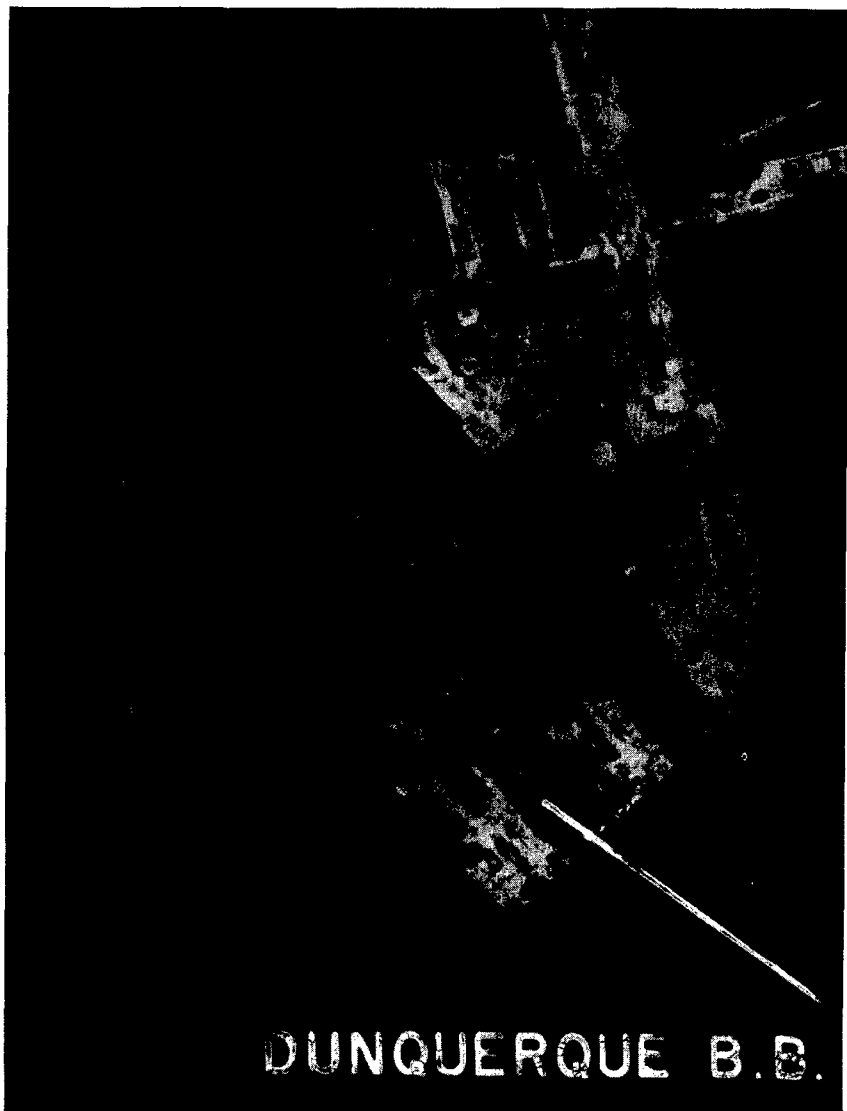
The 2d Air Combat Control Squadron (Amphibious), activated as an amphibious fighter control squadron to serve aboard headquarters ships, handled air control for the Air Task Force commander aboard the *Catoctin* during the assault phase. This unit reported on 16 March 1944 to the Commander of the U. S. Eighth Fleet, when invasion plans were already under way.

For the control of the numerous land-based aircraft necessary to the program, the communications and air control equipment on board were enlarged into a Joint Operations Room (JOR), where both naval officers and those of the 2d Air Combat Control Squadron were able to perform their various functions, including: control of air cooperation missions as directed by the air commander; standby control of fighter defense of the assault area as directed by the air defense commander; issuance of air raid warnings as directed by the naval commander; collection, evaluation, and dissemination of air information to all responsible officers.

The flexibility obtained by modifying the original JOR facilities was demonstrated by the fact that the exercise of control of air cooperation missions was assigned as an additional duty less than a week before D-day, while the further duty of issuing air raid warnings was assumed during D-day. One week before D-day a full scale exercise, placing particular emphasis upon those communications which would be available to the air commander, proved highly valuable.

The decision to assign the control of offensive fighter-bomber missions to the flagship, while control of defensive fighter patrols remained

with a fighter direction ship, proved to be sound. In the almost total absence of enemy air opposition, the supporting aircraft so con-



ATTACK ON TOULON HARBOR. While the prime objective of operations against Toulon was the destruction of submarine pens and submarines afloat, additional widespread damage was inflicted upon harbor installations and naval vessels which, while rendered unseaworthy by the French when the fleet was scuttled at Toulon, could be used as a platform for heavy naval guns. Outstanding among such vessels was the battleship *Dunkerque*, shown in this reconnaissance photograph.

trolled were able to give welcome aid to the quick establishment of the beachhead and the speedy advance of the ground forces.

The duties of the JOR as outlined above were operationally, and more specifically, broken down into four main subdivisions: control of tactical reconnaissance and fighter-bomber missions; furnishing information on movements and status of aircraft; air raid warning and



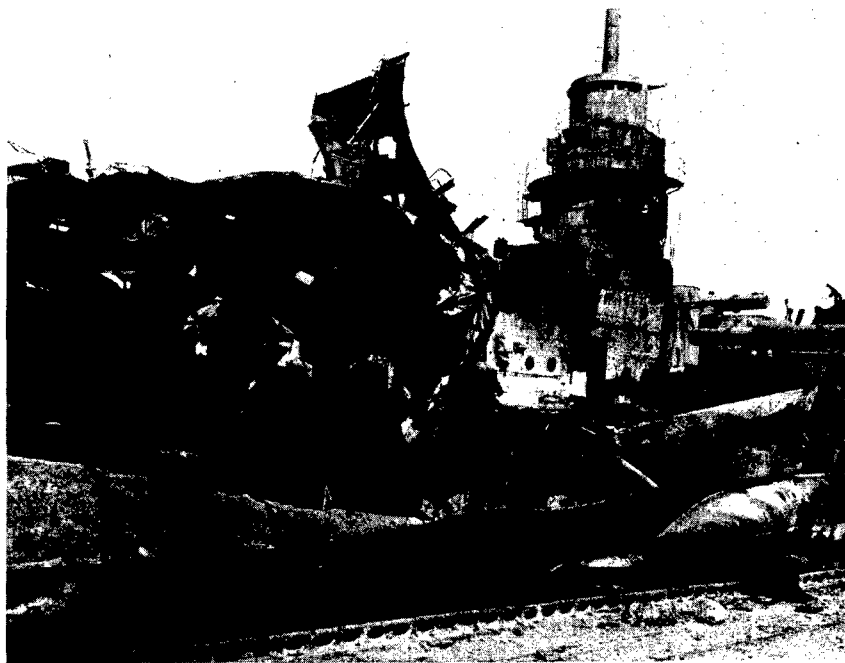
ATTACK ON TOULON HARBOR. This photograph, taken during the attack on the *Dunkerque*, shows direct hits being scored on the vessel, with another cluster of bombs on its way.

alerting the fleet; stand-by for fighter direction. How these duties were discharged, and what they involved, may be briefly noted here.

Control of Tac/R and fighter-bomber missions

Tac/R flash reports were furnished by pilots of two Tac/R squadrons flying Corsica-based Spitfires and P-51's, by carrier-based Spits, and occasionally by returning fighter-bomber missions. These missions, scheduled by XII TAC, reported name and mission number to the *Catoctin* when entering the area. This information was placed on the Tac/R status board and the flight told to proceed with its next assignment.

When flyers spotted anything of interest the information was immediately called in to the deputy controller, who made out a standard report and passed it to the XII TAC operations officer for action. If accepted, the attack order number of the fighter-bomber mission to which the new target was assigned was placed on the report, which



ATTACK ON TOULON HARBOR. This is what the bombs did to the *Dunkerque*. It also exemplifies the tremendous damage resulting from direct hits on naval vessels by heavy-caliber bombs. The entire drydock area had been rendered unserviceable, and extensive repairs were necessary before any appreciable activity could be resumed.

was given back to the deputy controller for transmittal to that mission when it checked in.

Fighter-bomber missions were flown by P-47's and P-38's based in Corsica and by carrier-based Hellcats and Wildcats. These missions, laid on by XII TAC, were given both a primary and an alternate target. They reported in to the *Catoctin* on Channel AC-3, giving name and attack order or mission number, which was immediately placed on the Fighter-Bomber Status Board. They were then told to attack either their primary or their alternate target, or to proceed on a special mission. This was necessary because the speed of the advance sometimes placed either or both of the briefed targets inside the bomb safety line. On other occasions, the special mission was given priority over the regular mission.

These special missions were usually against enemy transportation and were targets called in by Tac/R planes or received by XII TAC from the ground forces or other sources. The targets were given to the airborne planes in the clear since, due to the speed of operations, security did not demand encoding. Locations were given in Army grid, air grid, or by geographical references. On some occasions, if the Tac/R flight which reported the target was still in the vicinity, it was directed to lead the bombers to the target.

Here are a couple of examples of how this system worked. Spurtle Red Leader checked in and was told to proceed on his mission of armed recce. Three minutes later, Parkland Red Leader, returning from a bombing mission, called in a target of 20-plus boxcars and engines near Pertuis, which he could not take himself. This target was given at once to Spurtle Red Leader, who was told to call Parkland Red Leader on the same channel for directions. This was done and the target was successfully hit.

Alpaca Red Leader, a carrier-based Tac/R mission, called in a target of 20-plus armored vehicles east of St. Maximin which was given to Mallard Red, a carrier-based Hellcat mission of fighter-bombers just reporting into the assault area. Result—65 armored vehicles and troop carriers shot up. Confirmation of this was received a few minutes later when another Tac/R flight reported between 50 and 60 vehicles destroyed in that locality.

If any doubt remains about results from these missions against enemy transport, consider what happened on 10 other such attacks:

20-plus M/T destroyed near Digne
15-plus M/T bombed, one flamer, near Aix
150-plus RR cars hit
20 cars bombed, 30-car train strafed, north of Lake Bret
30 RR cars hit outside Avignon
45 boxcars left burning, two engines destroyed, near Cavaillon
1 turntable and 15 RR cars destroyed on D-9
2 barges bombed and strafed 20 miles west of Marseille
RR bridge and train bombed, 2 M/T hit north of Tarascon
10-plus M/T hit southeast of Avignon

During the four and one-half days the *Catoctin* was in control, approximately 300 fighter-bomber missions operated in the area. Of these, about 50 were antitransport missions given out by the controllers at the order of the Commanding General, XII Tactical Air Command.

Furnishing information on movements and status of aircraft

The JOR acted as a clearing house for all information concerning air operations in the assault area. This included movements of hostile aircraft; status of patrols, fighter-bomber, medium and heavy bomber, Tac/R, carrier-based aircraft, and night fighter missions; and results of these missions when they could be obtained through R/T interception. This information was obtained from six principal sources:

1. Monitoring of Operational Channels. All operational channels were manned by deputy controllers or monitors, and movements of aircraft were recorded on various status boards or in logs. A list of all call signs to be used in the operation was prepared in advance and aided in identifying missions.

2. Movements Liaison Officer. The MLO had advance information on most friendly missions entering or passing through the area. This included attack order number, time, number and type of aircraft, and objective. This information was supplied by XII TAC Operations aboard for the missions they scheduled, by signals received from the Strategic Command based in Corsica and Italy, and by the courier liaison officer.

3. Aircraft Carrier Liaison Officer. This officer advised the senior controller of the status of carrier-based aircraft, missions entering area, and the results of completed missions. He also passed back to the carriers requests for additional missions or the assignment of new targets. He was in constant HF/RT contact with the carrier task

force. This was invaluable, as carrier-based operations have many problems not common to land-based aircraft.

4. Radar. All information on air movements, both friendly and hostile, received on the filter table was passed to and displayed on the operations table and was available to all officers in the JOR.

5. Radio Intercept Service. Due to light hostile activity, there was little information from this source. However, more activity was reported than actually came into the area, despite considerable interference from W/T circuits.

6. Visual Observers. One visual controller and a recognition officer were located on the visual platform topside. They had a direct line to the senior controller and kept him advised of the movements and identity of all aircraft within visual range.

The information obtained from these sources was posted on various status boards in the JOR, entered in various logs, and furnished to interested persons as requested, or as conditions demanded.

Air raid warning and alerting the Fleet

This duty, originally assigned to FDT #13, was assumed by personnel aboard the *Catoctin* on D-day evening. Twenty-five red alerts were called in all. On nine of these alerts, hostile aircraft were known to be in the area, although only three of them attempted attacks. Alerts were kept at a minimum to avoid delay in unloading the ships.

Alerts and warnings of approaching flights, both hostile and friendly, were called to the Fleet over TBS by the naval air officer, whose position was next to the senior controller where he could overlook the operations table. All air information was available to him, and he in turn could keep the senior controller advised of all pertinent naval information. Through his familiarity with the ship, its officers, and the flag officers, he gave advice and help in many problems which arise when Army and Navy work together.

Stand-by for fighter direction

Since the USS *Catoctin* was second stand-by director, all information concerning the status of defensive patrols was kept current on the patrol status board. All operational channels were manned and monitored by controllers sitting in front of the operations table, where the complete air picture was always displayed. Thus fighter direction could have been taken over without disruption of control. In

fact, on several occasions control of certain channels was actually taken over while the FDT was temporarily off the air on these channels.

At 1400 on D plus 4, the control of Tac/R and fighter-bomber missions was turned over to XII TAC Advance ashore. At 1200 on D plus 7, control of fighter patrols was turned over to the 64th Fighter Wing SOR ashore by FDT #13, and the USS *Catoctin* ceased to be a stand-by.

Simultaneously the responsibility for air raid warning was also assumed by the 64th Fighter Wing ashore. The rebroadcasting of these warnings to ships in the harbor was made the duty of the Combat Information Center of the USS *Catoctin*.

It is of interest that, even though the USS *Catoctin* could have handled fighter direction as well as fighter-bomber and Tac/R control in an emergency, it was evident to all concerned that the separation of these activities was beneficial to the smooth working of the plan. The mobility of a separate fighter direction ship and the value of the possible additional equipment must be recognized.

On several occasions there were more transportation targets than there were aircraft to take them, for the following reasons:

1. Bad weather at base prevented missions from arriving in the assault area as scheduled.
2. Carrier-based aircraft, although in close proximity, were all out on other missions or otherwise unavailable.
3. The speed of the advance made the distance involved too great to employ patrols which came up with bombs for transportation targets. Their fuel would have been inadequate for both the mission and the patrol.

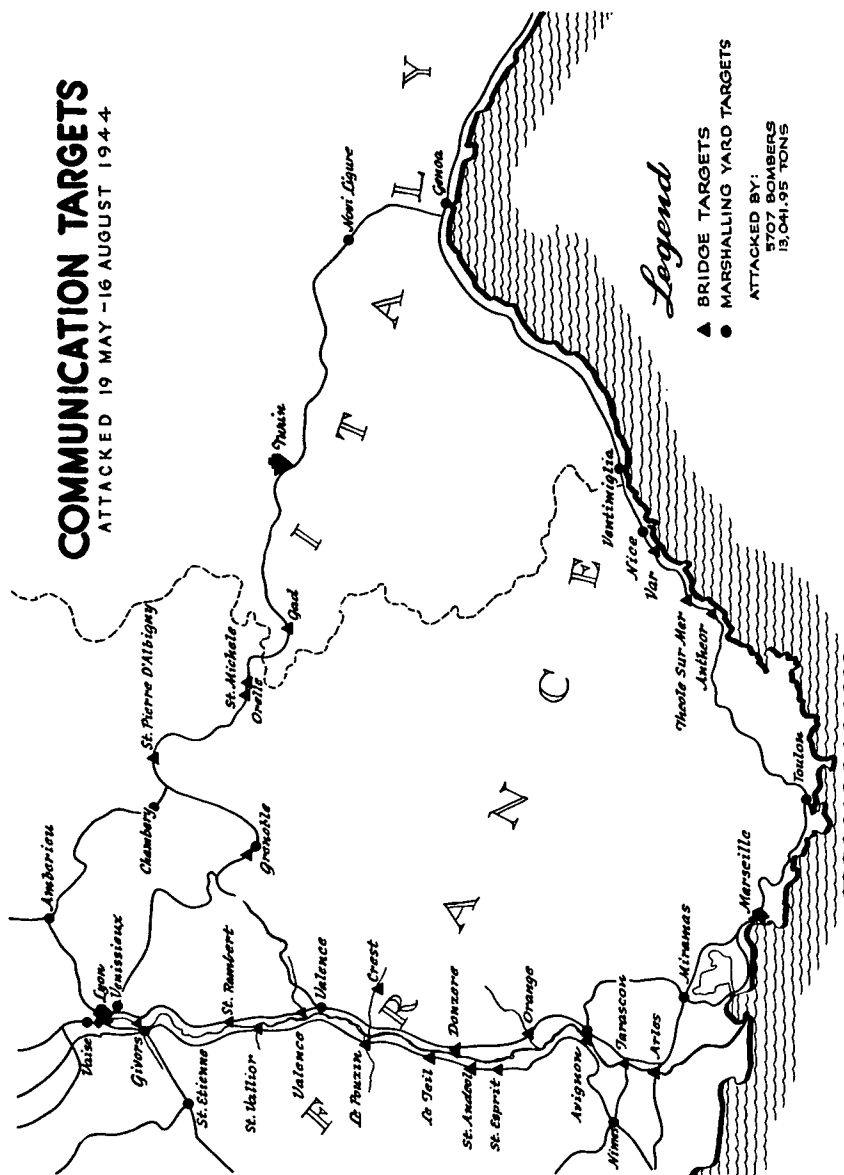
FILTER

Air opposition was very light and at no time afforded a fair test of the air defense system. From D-day through D plus 6, the following tracks appeared on the filter table:

Total number of tracks.....	1,538
Total hostile tracks.....	9
Total unidentified tracks.....	503
Total made hostile.....	2
Total made friendly.....	203
Total remaining unidentified.....	298
Total friendly tracks.....	1,231

COMMUNICATION TARGETS

ATTACKED 19 MAY - 16 AUGUST 1944



Planes of two fighter groups assigned to XII TAC for this operation did not carry IFF equipment and were frequently plotted as unidentified tracks, which caused unnecessary alarm and alerting of the Fleet. On every occasion that hostile planes were known to be in the area, some indication of their presence was passed by the Radio Intercept team. Information reached the filter table from: Radar (USS *Catoctin*), Naval Radar Guard, FDT #13 Track Broadcast,

Ground Control Intercept Reporting, Ops #2 Ashore Track Broadcast.

There were sufficient radar and reporting facilities, but land echoes caused by the rugged terrain often made it impossible to obtain continuous tracks and at times even to detect targets. One GCI, the FDT #13, and two or three Navy ships were the effective radar sources during the initial phase of the operation. Ample radio channels were allotted to make the radar reporting system work. Although the effectiveness of the channels varied from time to time, there were always enough usable channels for reporting. If the channels became unsatisfactory as the assault progressed, information was passed over prearranged stand-by channels, which worked very well. There were three main reporting nets.

Naval Radar Guard net

There were 16 ships in this net, of which four were appointed guard ships and four were stand-bys, the others being ready if called upon. The FDT #13 passed unidentified and hostile tracks over this channel when difficulty was experienced on the track broadcast channel.

Ground Control Intercept Reporting

Four GCI stations were scheduled to report on three VHF channels and one HF channel. Only two receivers and one transmitter were available for the three VHF channels, so the receivers were changed from time to time among them to get the best radio reception and information. There was too little traffic to demand separate VHF channels for each GCI. Indeed, better liaison could have been maintained if all the GCI stations had been on the same channel. The station scheduled to report on HF channel had difficulty getting set up ashore. When it did, contact was not good, so that the less satisfactory W/T had to be used in place of R/T.

Track Broadcast

Due probably to an unfortunate allocation of frequencies rather than to poor radio discipline, a number of stations blocked the HF track broadcast channel, rendering it useless much of the time. In one 5-minute period, nine station calls were heard, some in French, that did not belong on this frequency. After the FDT #13 began to call tracks over the FM and VHF frequencies, this channel was no longer necessary and was secured.

CONTROL OF DEFENSIVE PATROLS

As has been said, the FDT #13 was the fighter control ship, its duty to control defensive patrols over the beaches and to broadcast all unidentified and hostile tracks. An air-sea rescue team with high-speed launches was attached to this ship. For lack of space in the control room they operated from the visual platform topside. However, since the controllers were in constant contact with the aircraft and had a better over-all picture of the situation, they usually handled the operational matter themselves.

The FDT #13 was a British-manned, converted LST with a mixture of U. S. and British equipment. The radar equipment consisted of a CGI and a Type 11, the presentation of which could be remoted to the air control room. The VHF transmitters and receivers were BC-639 and BC-640 with RM 26-A control boxes. However, the toggle switches were disconnected and press-to-talk handsets were used, which proved better. The ship had no SG radar or surface search radar capable of picking up low-flying aircraft. Had this equipment been at hand, the one night attack experienced might have been detected in time. Fortunately no damage resulted.

Daytime control was handled primarily by 64th Fighter Wing personnel. The number of aircraft on the four patrols varied from 28 to 32. However, after D-day the schedule was not adhered to and at times there was a shortage of aircraft. Night fighter activity was handled by British personnel, with one U. S. controller on duty to handle all other matters. There were four to six night fighters on patrol, and some of these were handed over to the various GCI stations whenever conditions permitted.

An AAA liaison officer on the ship maintained radio communication with his batteries ashore. Information on hostile raids and friendly flights was passed by him to his shore batteries, which in turn gave him any information they had. In a few cases where our own night fighters entered the Inner Artillery Zone they were fired upon. Except at dusk, when identification was difficult, the control of AAA fire was good, and no friendly aircraft was shot down.

* * *

It is obvious that a decided change has taken place in the tactics used by the AAF in amphibious operations since the summer and autumn of 1943.

In the invasion of southern France, fewer than 30 fighter aircraft on an average were kept over the assault area for protection of the Fleet and the beaches. This is in contrast to the 60 to 80 aircraft protecting the landings at Salerno, a smaller operation in a smaller area.

The answer lies in the tremendous air supremacy the Allies built up in that year through effective *offensive* air warfare. Thus, *offensive* air warfare was conducted from the USS *Catoctin*, in contrast to *defensive* air warfare controlled from headquarters ships in previous operations.

The excellent cooperation and coordination among the several services and forces involved, along with the ample facilities of the joint operations room, made a success of the Air Command Post Afloat.

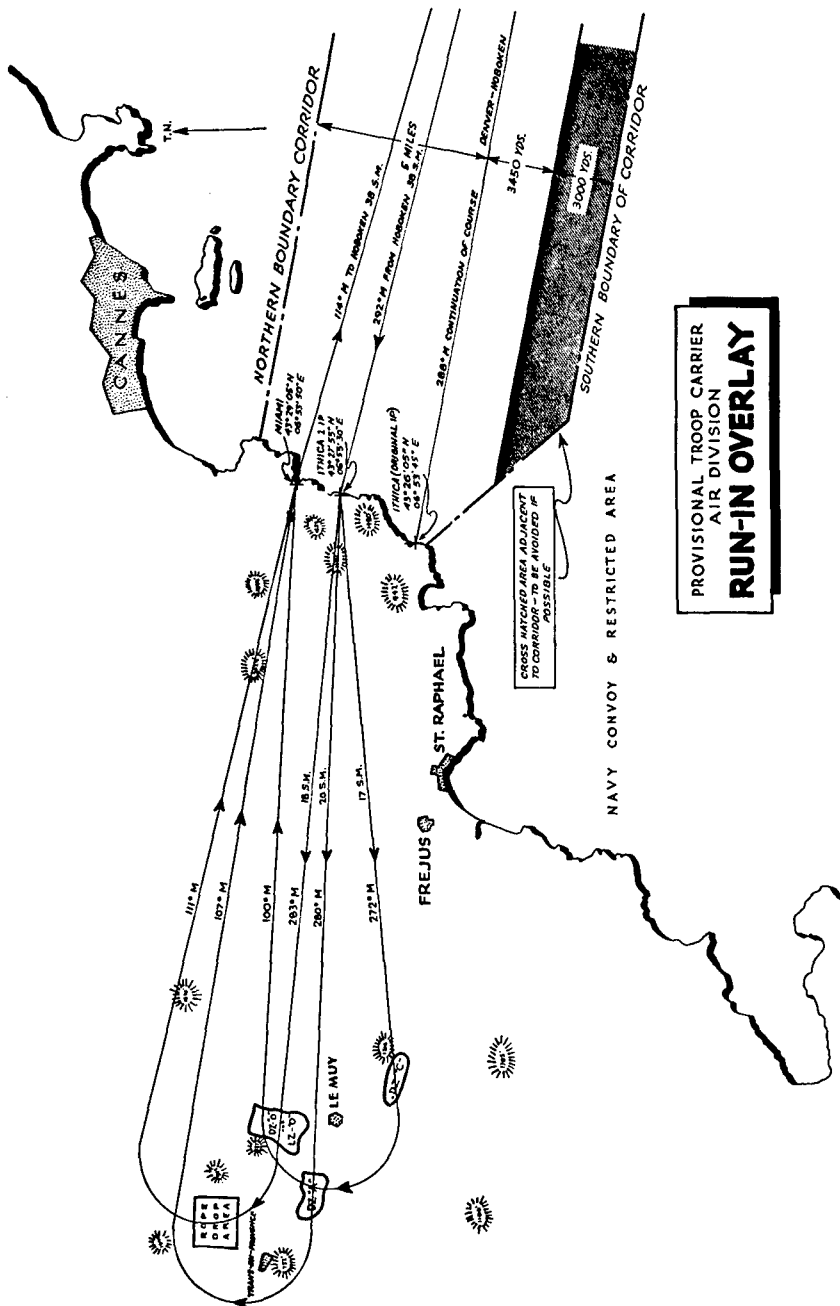
SUMMARY OF MASAF OPERATIONS

Air operations by the Mediterranean Strategic Air Force in cooperation with the successful landing by Allied troops on the southern coast of France, 15 August 1944, commenced on 19 May and continued through 16 August. During this 3-month period the Fifteenth Air Force dispatched 12,451 aircraft by day, 205 Group (RAF) sent 330 aircraft by night, and between them they dropped more than 18,000 tons of bombs on 113 specific targets, not including numerous fighter attacks on rolling stock, M/T, and targets of opportunity.

MASAF's air attacks in conjunction with the landings may be divided into three general categories—lines of communication, counter air, and close cooperation; although as D-day became imminent there was a certain amount of overlapping, as in the case of bridge targets close to the coast attacked just before, during, and on the day after the actual landings, which may be considered as both close cooperation and communications targets.

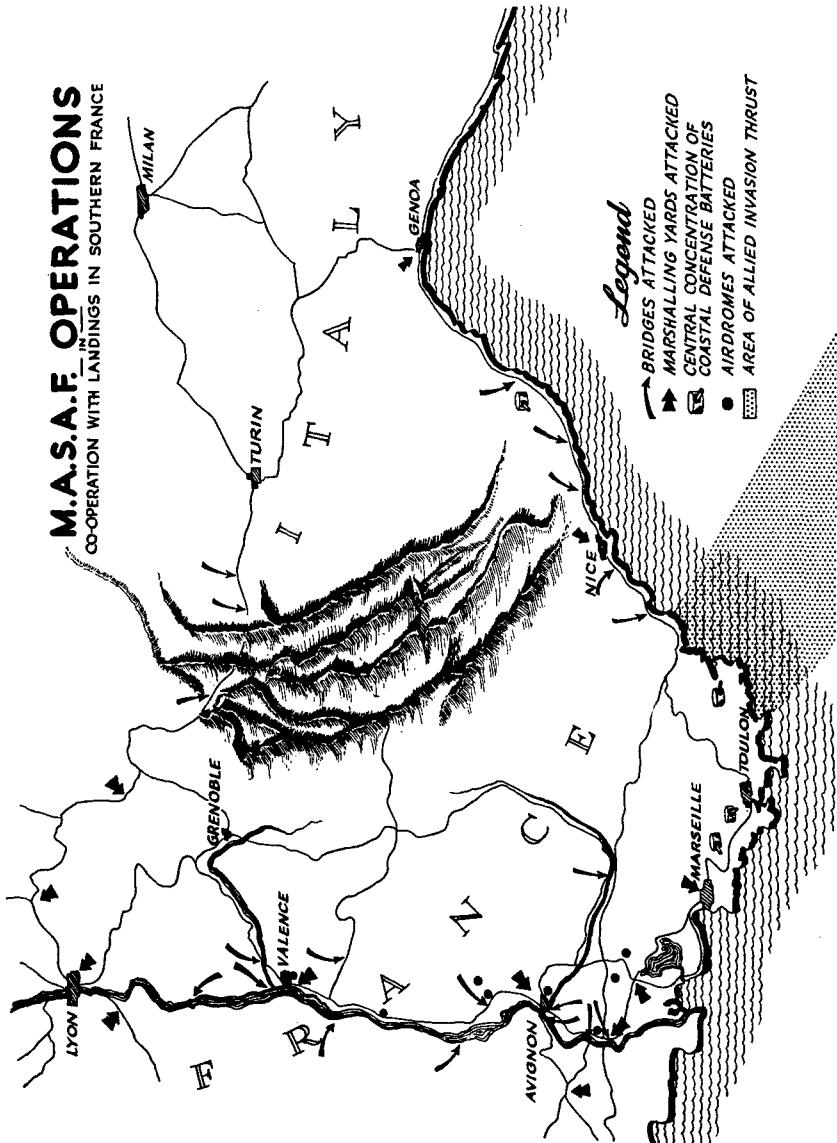
The great weight of effort from 19 May to D-day was directed against the enemy's lines of communication, and included effective attacks on marshalling yards as far north as Lyon, key bridges carrying north-south traffic in the Rhone valley, shipping, oil storage facilities, and actual wire communications centers. More than 13,000 tons of high explosives were dropped during the course of these attacks.

Bombers and fighters operated on a smaller scale against the several air bases in the general Marseille area, where the enemy had dispersed his bomber force. From these bases, reconnaissance flights and antishipping attacks were carried out, principally by Ju-88's.



PROVISIONAL TROOP CARRIER
AIR DIVISION
RUN-IN OVERLAY

Commencing on 12 August, 3 days before the landings were to be made, an intensive aerial assault was launched in an effort to knock out the enemy's coastal defenses and to reduce as far as possible his ability to inflict serious losses on the assault troops and matériel. On 12, 13, and 14 August, 1,652 heavy bombers dropped 3,839.2 tons of bombs on 40 gun positions in the Marseille-Sete-Toulon-Savona-Genoa area in a series of attacks coordinated with the Tactical Air Force. Fighters swept the area, attacking coast-watcher and radar installations.



Accomplishing the first heavy-bomber mass night take-off in Fifteenth Air Force history, close to 400 B-17's and B-24's dropped 500 tons of 100-pound bombs on the beaches in the Toulon-Cannes region. The first wave attacked between 0700 and 0730 hours, half an hour before the ground troops landed and secured the beachheads. The success of these operations may be measured in terms of gun positions knocked out and the notable lack of resistance, ground and air, met by the assault waves, enabling them to gain assigned objectives rapidly and with minimum loss of life and matériel.

COMMUNICATIONS

In 3 days, 25-27 May, 14 strategically located marshalling yards in the Marseille-Toulon-Lyon area were successfully bombed by 1,393 Fifteenth Air Force heavies. These yards served rail traffic from Paris, the upper Rhone Valley, industrial centers of western Germany, and Toulouse and other parts of western France—traffic which passes through them en route to southeastern France and Italy, and westward into the littoral zone of southern France.

Highly successful attacks at this time inflicted severe damage upon repair facilities and locomotive roundhouses, particularly significant because the bulk of southeastern France depends upon these yards. To carry out essential repair and maintenance activities after these attacks, yards in other areas of France had to be used at a time when intense Allied bombardment from the United Kingdom had rendered many of them completely or partially inoperative and had seriously disrupted the entire French rail net. These blows also served to impede the flow of military supplies within France proper, as well as two-way movement between France and Italy.

By D-day it was apparent that coordinated attacks by MASAF and MATAF had all but isolated the beachhead area (Cannes-Marseille) from every direction. The only available route from the west was over the one remaining bridge across the Rhone from Lyon to the sea at Avignon, while direct traffic from Lyon was blocked, as were the routes across the French-Italian frontier. The only other way open was the line Grenoble-Marseille. The enemy found it all but impossible to bring reinforcements into the newly secured and rapidly expanding Allied beachhead, and our troops surged forward at a rate made possible by the bombardment of German communications.