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THE
WAR AGAINST
THE LUFTWAFFE
AAF COUNTER-AIR OPERATIONS
APRIL 1943 - JUNE 1944
UNCLASSIFIED

Prepared by
AAF HISTORICAL OFFICE
HEADQUARTERS, ARMY AIR FORCE

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The War Against the Luftwaffe

AAF Counter-air Operations--April 1943 to June 1944
Chapter I

PLANNING THE AIR OFFENSIVE

In 1940 the Luftwaffe appeared to dominate the European Continent. After the successful exercises in Spain (1936-39) and Poland (1939), the German Air Force covered the invasion of Norway, crushed French aerial resistance in the brief weeks of the Battle of France, and as the summer drew near, was poised triumphantly on the brink of the Channel before opening the Battle of Britain.

During these months of victory, when the prestige of German arms had reached the highest point, the GaF was a most formidable weapon. Although more often used by the Wehrmacht in tactical rather than strategic operations, its bomber command possessed a powerful striking force that easily reduced Warsaw and Rotterdam, and almost threatened London with the same fate.¹ Many of the German planes represented advanced developments. The Stuka dive bomber seemed to have provided infantry with a new weapon far more effective for certain purposes than artillery. The basic German fighter, the light fast Messerschmitt 109, seemed more than the equal of any plane that could be brought against it until the Battle of Britain revealed it to be weak in armor and fire power.²

Nevertheless, in 1940 the GaF received its first severe defeat at the hands of the R.A.F. Antiaircraft fire-control devices such as radar proved fatal to the close formations of German bombers, while the fighters were unable to stand up against the heavy armament of the British Spitfires.
Following the defeat of the GAF over Britain, a change was noticeable in its composition. There was a growing emphasis on fighters which, eventually, was carried to the virtual extinction of the bomber command. The initial cause of this change is not yet clear. One source attributes it to the losses of German planes in the Battle of Britain plus the need of creating a defensive force of fighters to protect German industry against the night raids of the RAF. On the other hand, Hermann Goering himself has stated that it was not the losses over London that caused the increase in German fighter production, but the preparations for the campaign against the U.S.S.R. Owing to the lack of concentrated bomber targets there, Goering stated, the demands on bombers were small while there was a greatly increased need of fighters.

Whatever the underlying causes, the summer of 1940 saw two important developments in the German fighter command: (1) the appearance of a "souped-up" version of the He-109, and (2) the design of a new and important fighter. The new models of the He-109 were faster, armored, and much better provided with fire power. The He-109F had a cannon (.3 G 151/20) firing through the propeller hub, in addition to the machine guns. The G model which became operational late in 1942 kept the cannon and raised the two machine guns to approximately .50 caliber with 900 rounds each. The plane was powered with a DB-605 engine of 1700 horsepower and was believed to have a service ceiling of nearly 40,000 feet and a speed of more than 400 miles per hour.

The new fighter was the Focke-Wulf 190 (Fw-190). After coming off the drawing boards in mid-1940, it presented a serious production problem. To produce the plane for wartime consumption, there seemed to be three
alternatives. It could be built in new plants especially constructed for the purpose, but this would involve at least a year's delay and would result in heavy costs and manpower shortages. A second alternative considered was to convert existing factories to the production of the new fighter. This plan had the advantage of being somewhat easier to set up than the other alternative, but it had the decided disadvantage of slowing down the output of already established types; the readjusting of machines and tools plus the retraining of personnel were regarded as almost insurmountable obstacles. The third alternative, and the one eventually adopted, was to convert certain Me-109 plants to the manufacture of the F.1-190. Since many of the tools would do for the new plane, and the workers would be accustomed to building a similar type, this idea was apparently considered the simplest and most practical of the three.

At the beginning of 1941, the Me-109 was produced in five German and one Austrian plant as follows: (1) Fiesler (Kassel), (2) Arado (Tarnow), (3) Go (Cochersleben), (4) Messerschmitt (Regensburg), (5) Erla (Leipzig), and (6) Messerschmitt (Dienert Leustadt). The first four were producing 40 to 50 fighters per month and the last two between 60 and 75. It was finally decided to convert the first three to the production of F.1-190's because it would involve less loss of output, the plants concerned were closer than the others to the parent Focke-Wulf plant at Bremen, and it was believed that this arrangement would be the most efficient for the subcontractors. Production of the series was initiated early in 1941 at Bremen, and by the fall of that year the Arado plant at Tarnow was ready to build F.1-190's. Six months later, the Fiesler plant at Kassel was converted, and by the fall of 1942 the Go plant was making the new
plane. It was estimated by November that Me-109 production had dropped to 260 per month while the output of the FW fighter had risen to 220 monthly, thus bringing the total construction of single-engine fighters to 480 per month. The first appearance of the new Focke-Wulf 190 late in 1941 created something of a sensation. The original version had a maximum speed of 385 m.p.h. at 17,000 feet, and could climb to 18,000 feet in six and one-fourth minutes. It had a ceiling of 36,000 feet, was protected with 197 pounds of armor, and armed with two low-velocity 20-mm. cannon and two machine guns. Later models designed for ground attack carried extra guns, and as much as 732 pounds of armor plate around the pilot and on the bottom of the fuselage. It seemed possible that the Germans had devised a fighter superior to any similar plane that might be brought against it.

It does not appear that the final decision to build up a huge fighter force was reached before the middle of 1942. By that time, however, certain developments greatly emphasized the need for this type of plane. Hitler's Soviet adventure was not proceeding according to schedule and the scope of the campaign was constantly increasing. The largest part of the German fighter command was flying on the Eastern front, and more and more planes were constantly needed. Meanwhile, a new menace had arisen in the West. The RAF, supposedly driven out of the skies during 1940 and 1941, was beginning its effective saturation bombing by night, and Flying Fortresses of the U.S. Eighth Air Force had made their first appearance over German-held territory on 17 August 1942. All this made it clear that in addition to the requirements of the war in the East, it would be necessary to build up a large fighter strength in the West to protect
the German cities and war industries. Since the bulk of German air
power was then concentrated on the Eastern front, the increased produc-
tion of fighter planes was the solution for this problem.17

Therefore, by the middle of 1942, elaborate plans were being made
for a tremendous increase in fighter aircraft production. A committee
had already been formed under Göring to speed up the industry, and it
was hoped that by December 1943 planes would be coming off the assembly
lines at a rate of 2,000 per month.18 This was to be brought about by
a reorganization of aircraft production. Previously, the industry con-
isted of a large number of firms each making its own components and
then assembling a small number of aircraft; further expansion along
these lines seemed blocked by the labor shortage and the fact that the
supply of skilled craftsmen had been considerably diluted by the im-
portation of unskilled foreign workers. Göring's committee decided to
reorganize the industry by breaking down working pressures to the
simplest stages. Some factories were to switch to the making of com-
ponents while others were to specialize in the assembly of the finished
products. Geographically, production was to be centered in a few great
complexes, consisting of an assembly factory surrounded by various com-
ponent factories within a 50-mile radius feeding their products into
the central assembly.19 That such a scheme was vulnerable to air attack
the Germans well realized. At one time, it was hoped to establish a re-
serve of 100 per cent duplication, but it is not clear whether or
not this was accomplished. However, at the time the production setup
was reorganized, the Germans apparently did not believe strategic preci-
sion bombing would be effective.20
With the designing of a new fighter and the reorganization of production, the first phase in the expansion of the German fighter command was well under way. A second phase was inaugurated in the fall of 1942 when a great expansion in the construction of the Me-109 was begun.

Earlier rumors that the FW-190 was going to replace the older fighter plane were killed by the unusually successful performance of the G model which was being produced by the Messerschmitt complex at Wiener Neustadt as early as the summer of 1942. Estimated production at this time was 80 to 90 planes a month.21

At the close of the summer, all the plants making the Me-109 suddenly began a tremendous increase of production. The Wiener Neustadt facilities progressively increased their output until they were building 220 fighters a month (June 1943) representing an increase of 150 per cent over 1942 production.22 Since this complex was 300 air miles from London, the Germans probably felt the chances of being bombed out were relatively remote. At Regensburg, the output of Me-109's had been stabilized for some time at 45 per month; however, by November 1942 it was increased to 75 and in June of the following year it was believed to have reached 200.

By this time, both huge complexes were producing 55 per cent of all single-engine planes used by the GAF. During this same period, the third center of Messerschmitt production, the Erla plant at Leipzig, showed an expansion of 50 per cent.23

While the output of the Me-109 climbed rapidly, that of the FW-190 showed surprisingly little fluctuation between November 1942 and June 1943. There is evidence, according to an OSS report, that this stabilisation may have been caused by the physical relocation of certain factories to safer
regions in the eastern part of the Reich. It is possible that the heavy raids in 1942 on Bomber Command targets, such as Kassel, Essen, and Hamburg, hastened this shift by convincing the German leaders that eastern factories were in less danger of being damaged. The Italian factories, for example, were located in the south of the country. The apparent shift of the Italian factories to the north was probably caused by the heavy air raids on Bremen, 17 April 1942, which destroyed most of the Italian factories in the city. The apparent failure of the Germans to repair the damage caused by the heavy air raids on Bremen, suggests that the assembly of Fw-190s had been transferred, possibly as far back as the middle of 1942, to eastern Germany, the most likely spot being Magdeburg. It was also believed that the assembly plant at Magdeburg was moved to Rostock near the Baltic coast.

Meanwhile, the production of aero-engines developed along the same lines as the airplane factories. For ever possible, a central assembly point was surrounded with its own satellite component plants. Three firms dominated the production of aero-engines: the Junkers动机n, the Niederrheinische Motorenwerke (NMI), and the Daimler Benz (DB). The Junkers engine was mainly produced at Ansbach which was considered the most advanced aero-engine center in Germany and was the first to adopt the conveyor belt system of production. The DB was developed and manufactured at Munich/Illesch, and the NMI had its research center at Stuttgart/Uberturbheim and its production center at Karlsruhe. Throughout most of the period covered by this study, the aero-engine industry was hampered by a serious shortage of raw materials, especially those used in hardening steel. Moreover, the night raids on Cologne, Essen, and Hamburg knocked out certain plants producing crankshaft forgings for the 35-355
engine, and as a result there was a shortage of forgings throughout 1943, causing some backlog of engines awaiting these parts.²³

To summarize, by the middle of 1943 German fighter production and the massing of German planes in the West were beginning to cause the British and Americans serious concern. In June, it was estimated that 540 Me-109's and 230 Fw-190's would be produced as well as other models which could be employed effectively against our bomber sorties. Furthermore, there had been a steady shift of GAF units from the East to the West, and another fighter wing, the 11th Jagdgeschwader, had been formed to check strategic bombers operating from England.²⁹ According to American estimates, the GAF order of battle early in 1943 showed the following distribution:³⁰

<table>
<thead>
<tr>
<th>Axis air strength</th>
<th>Total combat and miscellaneous aircraft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western front</td>
<td>1320</td>
</tr>
<tr>
<td>Mediterranean (and Italy)</td>
<td>1248</td>
</tr>
<tr>
<td>Central Germany</td>
<td>732</td>
</tr>
<tr>
<td>Russian front</td>
<td>2460</td>
</tr>
</tbody>
</table>

Not only was this force in the West a major threat to strategic bombardment but if not destroyed it could be greatly augmented by reinforcements from other areas when the threat of an invasion became imminent. At the close of 1942, one source estimated the amount of air power that the GAF could mass against a cross-Channel operation at approximately 3,700 planes.³¹ All these factors made it clear during the first months of 1943 that concerted action must be taken by both British and American air forces to drive the Luftwaffe out of the skies in order to come to grips with

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²³According to "The Attack on the GAF" the actual figures for April production of various types of German aircraft were: Me-109, 270; Fw-190, 230; Me-110, 55; Me-210, 55; Ju-88, 25; Do-217, 15; total, 650.
German industry and pave the way for an invasion of Hitler's Festung Europa.

The RAF had already made a beginning. In addition to strategic bombing, two types of operations known by the code names of RHUBARB and CIRCUS were frequently being mounted with the express purpose of inducing the enemy to commit considerable numbers of his fighters to battle. In RHUBARB operations, heavily armed fighters and fighter-bombers operated within a 150-mile radius of the RAF forward fighter stations against enemy installations near the Channel coast. By striking at ground targets of considerable value to the enemy, such as transportation, port installations, and the like, it was hoped that he would be forced to give battle to protect them.\textsuperscript{32} CIRCUS operations were similar but involved the medium bombers of No. 2 Group RAF; later it was hoped to use the Marauders of the 3d Bombardment Wing (Eighth Air Force) when this organization became operational.\textsuperscript{33} Targets were carefully selected within an area 150 to 180 miles from forward bases. According to British authorities, the "prime object of the operations is again to destroy [the enemy] fighter by our fighter aircraft rather than to inflict any serious economic damage on his war machine in the industrial sense by destroying any of his main works, which, in point of fact, are not situated in the areas covered by these operations."\textsuperscript{34} American fighters and later medium bombers were often ordered to take part in missions against RHUBARB and CIRCUS targets as a means of acquainting new units with combat conditions in the theater, but it is doubtful if these missions seriously threatened the German Air Force. As time went on, the enemy often refused to commit his fighters against coastal missions.
Attacks by the heavy bombers of the Eighth Air Force were more effective, but throughout the latter part of 1942 when the Eighth had become operational these raids were more important as indications of future activity than as an immediate menace.* Not only had weather during the autumn and early winter frequently interfered with missions, but the Eighth had been called on to divert much of its promised equipment and crews to the newly formed Twelfth Air Force. Partly because of this, the build-up of planes in the United Kingdom lagged behind commitments, replacement aircraft and crews were lacking, and the personnel that did arrive from the United States often needed considerable training before being used in operations.35 As a result of all these factors, the accumulation of American air power was painfully slow. As late as April 1943, there were on hand with American units in England only 264 heavy bombers (198 B-17's and 66 B-24's) and 172 P-47's.36

In spite of the meager force available, April marked the first major advance in the war against the Luftwaffe: the formulation of the Combined Bomber Offensive Plan (CBO Plan). This document, which provided for the build-up and operation of a large bomber force based in England, was the culmination of much thought on the proper employment of air power. While German air doctrine tended to emphasize tactical operations in close coordination with the ground forces, both the RAF and AAF were anxious to exploit to the fullest extent the possibilities of strategic bombardment. In the United States, General Mitchell's doctrines were still accepted in

*Only 27 missions were carried out by the Eighth Air Force in 1942, and none of them exceeded an attacking force of 79 planes.
the Air Corps and had received further development at the hands of Arnold, Andrews, Eaker, Spaatz, and other pioneers in air strategy. Then, on 9 July 1941, President Roosevelt asked the Secretary of War to prepare a plan for over-all production requirements needed to defeat our possible enemies, an opportunity was afforded our air strategists to put forward their concepts of modern aerial warfare.

The air document which was generally known by its short title of NPD/1 was submitted on 12 August, and was broadly conceived. The section covering air production called for 60,000 planes, and envisaged an air war of three phases culminating with a great intensification of air operations to insure air supremacy prior to an invasion of German-held territory. Targets for bombardment were electrical installations such as power lines and hydro-electric stations, as well as transportation systems, oil producing centers, and industrial plants. It was also recognized that before these objectives could be attacked, it might be necessary first to neutralize the Luftwaffe by "employing large numbers of aircraft with high speed, good defensive fire power, and high altitude" and by making deep penetrations into the Reich to attack airfields, aluminum plants, and aircraft factories.

This document is important because it recognized that an indispensable preliminary to an invasion of the Continent was the elimination of German air power. It is also significant because it clearly established that the attack on the GAF was a double operation, an attack not only against the sources of aircraft production but also against units of the Luftwaffe at their bases. It also recommended that plans be undertaken looking toward the rotation of heavily armed escort fighters to protect the bombers.
This document was accepted as a basis for further planning in September, and then followed a broad discussion of over-all strategy between the highest British and American authorities. After the Japanese attack on Pearl Harbor, many details were naturally altered owing to the exigencies of the crisis in which the United States found itself, but the basic ideas embodied in MD/1 remained largely unchanged, and were repeated in a later modification of the project known as MD/42. This plan was drawn up by General Arnold in response to a request on 24 August 1942 from the President to his military authorities for a statement of the needs of the army, navy, and lend-lease "in order to have complete air ascendancy over the enemy." In his reply for the A.F., General Arnold listed a series of air operations beginning with an air offensive against Europe to deplete the G.F., destroy the sources of German submarine construction, and undermine the German war-making capacity. Air ascendancy was defined as the depletion of the enemy air force to such an extent as to render him incapable of resisting the offensive of our land, sea, and air forces.

First priority in the air offensive against Europe was the attack on the Luftwaffe. To eliminate it from combat, MD/42 called for a total of 22,373 sorties, dropping 44,748 tons against 11 fighter factories, 15 bomber factories, and 17 aero-engine plants. To attain complete destruction of these plants, attacks were to be repeated where necessary at two-month intervals. Local attrition was to complete the destruction of the G.F. The timetable set up in the plan allowed six months for operations at full strength to destroy the German air power. Applying this to the actual situation, one-third of the job was to be completed in
1943, thus requiring four additional months of 1944. If all went well, General Arnold believed that the Luftwaffe could be eliminated as a threat to our forces by May 1944, and that cross-Channel operations could be started soon after. Later developments were to prove the remarkable accuracy of ABD/42's timetable.

The final phase of planning the attack on the GAF began on 9 December 1942 when a Committee of Operations analysts was set up under Management Control to prepare a report analyzing the rate of progressive deterioration that should be anticipated in the German war effort as a result of the operations being planned against its sustaining sources. After some months of intensive study, the committee submitted a report to General Arnold on 3 March 1943 which is remarkably like the final form of the OBO Plan.

This report did not depart from the general principles of an air offensive against the Reich as laid down in \textit{ABD/1} and \textit{ABD/42}, but it succeeded in giving these doctrines their most elaborate application based on what was then available in planes, crews, and time, as well as indicating what build-up of forces would be necessary to carry the offensive to a successful conclusion.

The committee recognized the desirability of carrying out precision attacks against the German fighter assembly plants and engine factories, but felt that the present build-up of heavy bombers with units in the theater was insufficient to make the necessary deep penetrations. A minimum force of 300 bombers would be needed, the committee believed, to organize the requisite diversions and penetrate to the heavily...
defended targets.* It was estimated that it would take a total of 800 bombers in the theater to keep 300 constantly in operation, and until this build-up could be achieved, the COA did not recommend mounting a large-scale offensive against aircraft factories, but advised instead that missions be concentrated on repair depots, U-boat bases, and the few factories that were located close to the coast.43

It was hoped that by July the bomber strength would be augmented to the point where deep penetrations of 4,000 miles could be effected, and in this second phase of the offensive, the committee recommended a heavy concentration on GAF fighter factories. At this point, the experts disagreed. In considering the German aircraft industry, the COA had examined the possibility of attacking (1) airframe components, (2) engine components, (3) fighter assembly plants, and (4) engine assembly plants. The principal disagreement was over whether the heaviest attack should be directed against fighter assembly plants, or fighter-engine assembly plants.49 Those who favored an attack on fighter assemblies pointed out that the GAF had to recreate itself approximately every three months, and that the destruction of seven assembly plants, even if remediable within 30 days, would have only to be repeated twice in order to effect a substantial reduction of GAF strength.50

The opponents of this view were disturbed by the high recuperative ability of the fighter assembly plants, and feared that not enough damage could be done to put them out of production for any long period of time. On the other hand, they held that engine assembly plants could be put

*Of the 300 bombers, 50 were to form a diversionary force to hold down a part of the German fighter strength, 200 were to constitute the main striking force, and the remaining 50 were to divert the German fighters while the bombers were withdrawing from the target area. 500 Plan, in APWI files.
out of action for six months or more. Furthermore, five plants accounted for all the ME engines used in the Fw-190, and another five plants produced the DB motor used in the Me-109, -110, and -210. Consequently, a comparatively small number of targets might, if thoroughly bombed, upset a great part of the German fighter production. The G-2 did not attempt to solve the dispute, and in later operations the combined bomber forces attacked both fighter assembly and engine assembly plants.*

The final form of the CBO Plan which was completed about the first of April consisted of a carefully selected list of target systems, coordinated with the expected build-up of bomber strength in the theater, and a timetable. The main purpose of the plan was to carry out the directive of the Combined Chiefs of Staff at the Casablanca meeting "to accomplish the progressive destruction and dislocation of the German military, industrial and economic system, and the undermining of the morale of the German people to a point where their capacity for armed resistance is fatally weakened." The target systems designated for attack were submarine construction yards and bases, German aircraft industry, ball bearings, oil, synthetic rubber, and military transport vehicles.

The determination of the number of bombers needed to accomplish the CBO Plan was based on a yardstick derived from previous operations.

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*The comment of a captured German field marshal on this point is interesting. "As the brunt of the attacks throughout July, August, September, and October 1943 was borne by the aircraft industry, naturally that suffered most. Fortunately you didn't do one thing; you didn't attack our engine production on a large scale—a much more vulnerable branch—instead you went for the airframe plants." K0 15385 in A-2 Library.
of the Eighth Air Force. Twelve successful missions were mounted in January, February, and March using approximately 100 bombers on each. It was found that sufficient bombs fell within a circle of 1000 foot radius centered about the aiming point to cause the desired destruction. For each prospective target the number of 1000 foot radius circles necessary to cover it has been calculated. The yardstick as determined by experience is therefore: the number of 1000 foot radius circles of destruction, each requiring 100 bombers.

To carry out successful missions against the six target systems, using the ratio indicated above, the Combined Bomber Offensive required the following build-up of U.S. heavy and medium bombers in the United Kingdom:

<table>
<thead>
<tr>
<th>Date</th>
<th>Heavy</th>
<th>Medium</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 June 1943</td>
<td>944</td>
<td>200</td>
</tr>
<tr>
<td>30 Sep 1943</td>
<td>1192</td>
<td>400</td>
</tr>
<tr>
<td>31 Dec 1943</td>
<td>1746</td>
<td>600</td>
</tr>
<tr>
<td>31 Mar 1944</td>
<td>2702</td>
<td>800</td>
</tr>
</tbody>
</table>

The operational timetable of the offensive was divided into four phases. The first phase ended 1 July 1943 and was based on the assumption that no more than 300 bombers would be continually in operations and that the operational range would be 300 miles. Main emphasis was to be placed on striking U-boat bases. The second phase from July to October was to be principally against fighter aircraft industries. The radius of action was to be extended to 400 miles and the 1,192 bombers in the theater were expected to provide an average striking force of 450 planes. While the Fortresses and Liberators were hitting the main objectives, the mediums were to mount diversionary attacks on German-held airfields within their limited range. In the third phase, October to January 1944, the German fighter force was to be kept depleted, and in addition to the aircraft industry, oil, transportation, and rubber facilities were to be attacked. The average striking force during phase No. 3 was to be about

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550 bombers. In the fourth phase in early 1944, the principal objective would be to sustain the previous effects achieved and pave the way for the invasion of the Continent. 55

The committee recognized the immediate danger to their plans from the German fighter force in the West, and it was declared to be "an intermediate objective second to none in priority." 56 Furthermore, the Plan emphasized in italics the statement that 57

*If the growth of the German fighter strength is not arrested quickly, it may become literally impossible to carry out the destruction planned and thus to create the conditions necessary for ultimate decisive action by our combined forces on the Continent. Hence the successful prosecution of the air offensive against the principal objectives is dependent upon a prior (or simultaneous) offensive against German fighter strength.*

When completed by the GJO in Washington the Plan appears to have been coordinated with British and American authorities in the theater, for on 15 April 1943 Air Marshal Sir Charles Portal wrote General Arnold indicating his full approval, and stating that the Commander in Chief of the RAF Bomber Command had seen the plan and was also "convinced of its soundness and importance." 58 Portal urged that "every effort ... be made to achieve and if possible to exceed the program." 59 Final approval came from the Combined Chiefs of Staff on 19 May 1943.

The GJO Plan, although recognizing the immediate importance of checking the growth of the German Air Force in the West, nevertheless dealt with it as only one of several important objectives. British thought at this time seems to have been more concerned with checking the growth of German fighters by striking at airbases, repair installations, and Messerschmitt and Focke-Wulf factories, if one may judge by a British plan developed concurrently (not, apparently, as an alternative proposal.)
with the G50 Plan. Entitled: "The Attack on the G5F," this document stated: 40

The most formidable weapon being used by the enemy today against our bomber offensive is his Fighter Force--his single engined fighters by day and his twin engined fighters by night, and the elimination or serious depletion of this force would be the greatest contribution to the furtherance of the joint heavy bomber offensive of the RAF and the AAF.

This document then called for an attack on the sources of fighter strength--both airfields and factories. It is evident that the authors of the plan assumed that most of the attacks on the fields would be made by medium bombers and fighters, although several such missions had already been mounted by the heavy bombers of the Eighth Air Force. Since some 34 G5F airfields housing about 165 aircraft were within range of NEBEL and CIRCUS operations, the study recommended that they be promptly attacked.

The fields at Rennes/St. Jacques, Caen/Jarguquet, Lille/Vendeville, Vitry-en-Artois, Courtrai/Nevelghem, Beaumont-le-Roger, Bernay/St. Martin, Evreux, Cherbourg/Haupertus, Merville, Brest/Guipavas, Amsterdam/Schipol, and Roosdrecht were pointed out as being especially important. 61 Most of these fields were later attacked by units of the AAF.

After careful study of the capabilities and limitations of the heavy bomber, 10 towns were listed in the plan as "tactically suitable" for attack by high-level precision daylight bombing by the VIII Bomber Command, to be followed by G5F night attacks. These towns were Bremen (He-190 assembly), Brunswick (He-110 assembly and DB-605 engine plant), Kassel (He-190 assembly), Hamburg (He-110 engines), Schweinfurt (ball-bearing works), Hanover (aero-tire works), Stuttgart (important aircraft components), Gotha (He-110 assembly), Eisenach (aero-engines), and
Oschersleben (H.I-190 assembly).\textsuperscript{62} As in the case of the airfields noted above, these aircraft factories were later attacked heavily by the VIII Bomber Command. Although no direct evidence bears on the point, there is a good deal of indirect proof to show that this British study had something to do with the target selection of the Eighth and later the Ninth Air Forces.

Therefore by the beginning of April 1943, the stage was set for a great air battle. The Germans had committed themselves to a program of fighter construction that definitely threatened the success of the combined strategic bomber offensive and the attack on the Continent. To check this development, the British and American air strategists were planning nothing less than the destruction of the Luftwaffe, and its exclusion from the air over Europe. This was to be accomplished by a double attack: on one hand German aircraft factories were to be destroyed as soon as the build-up of strength permitted deep penetrations, and on the other the Luftwaffe was to be forced to commit itself to battle wherever it could be found, either on the ground or in the air. It was now the task of the A.F and the R.A.F to prove that Hitler's Festung Europa was, indeed, a fortress without a roof.
Chapter II

THE FIRST OPERATIONAL ALLIED BOMBING

Although the 20 Plan was not formally approved by the Combined
Chiefs of Staff until the middle of May 1943, attacks on German aircraft
production commenced in April. By this date, there were 199 B-17's and
66 B-24's in the theater with units, and during the first quarter of the
new year, they had dispatched 1,031 sorties with claims of 203 enemy air-
craft shot down.\(^1\) This strength was regarded as too meager to sustain
deeper penetrations into the heart of Germany, where the bulk of the air-
craft industry was located, but installations nearer England could be
attacked with small concentrations in comparative safety.

Such a mission was carried out on 5 April. The target was the Sola
aircraft and Aero-Engine Repair Works near Aalborg, only about 190 miles
from the nearest English bases. Out of 104 planes airborne, 64 B-17's
and 18 B-24's dropped 240.5 tons of 1,000- and 500-lb. Gb bombs with
fair results. Damage was done to an assembly shop, and some repair
installations were set on fire. Four bombers were lost and claims of
23-24 were made.\(^2\) In this rather unimpressive manner, the X.L.X.L.X.*
offensive against German aircraft production was inaugurated.

The only other similar mission successfully carried out during the
month was one of the heaviest yet run off by the Eighth Air Force. On

\(^{1}\) The code name X.L.X.L.X.* was assigned to the Combined Bomber Offensive
when it was adopted. However, in the various theaters where the 205.
17 April, 115 bombers were dispatched to strike at the Focke-Wulf fighter assembly plant situated at Nauenland, two and one-half miles from the center of Bremen. This mission was considered especially important, since the F.7 factory here was the parent producer of the F.190 single-engine fighter. Its estimated production of 60 planes per month was believed to be 35 percent of all F.190's produced.4 In addition to the F. plant, there was also a Junkers 88 (Ju-88) assembly plant, and a Ju-87 components factory near-by.3

The mission was run off under somewhat adverse conditions. The weather was hazy making target identification difficult; the excellent camouflage used by the Germans added to the problems of the bombardiers. Furthermore, the flak was of a concentration heretofore unknown. According to the Tactical Mission Report:4

The intensity of the flak was probably the most severe that has ever been experienced by this wing, and the huge volume of smoke that overhung the target area while our later Groups were approaching acted as a very real deterrent, causing many members of combat crews to feel that it would be an impossibility to fly in the area without suffering damage.

*(contd) was mounted, POINTBLINK came to mean specifically the attack on the G.F and its supporting production centers. When Col. C. A. Young of the Fifteenth Air Force was asked to define POINTBLINK he replied: "POINTBLINK is a code name to designate the fighter aircraft target system. It includes all fighter aircraft plants and ball bearing factories." (Interview with Col. C. A. Young, 3/3, 1944, 15th AF, 2 May 1944 in History, 15th AF.) As used in this study POINTBLINK will refer to attacks on the German aircraft industries, and Luftwaffe bases.

#The F.7 assembly at Bremen was moved to Marienburg, but it is not yet clear whether or not this move had taken place at the time of the 17 April raid. Later the British believed that it had already taken place. However, when Goering was interrogated after being taken prisoner, he stated that the April raid had inflicted damage on F.7 assembly at Bremen. RO-13951 in 1-2 Library.
Although only one plane appears to have been actually destroyed by flak, 43 others sustained battle damage.

It had been expected that the Luftwaffe would rush to the defense of such an important target, and such proved very much to be the case. Combat crews estimated that some 150 enemy aircraft took the air against the bombers, and attacks began while the formations were passing over the Frisian Islands, becoming more and more intense as the target was approached. To meet these attacks, the three elements of each combat wing were flown in a vertical wedge with a permanent group leading, and another permanent group slightly below and behind to obtain support from the nose guns and ball turrets of the lead group. The 102d Wing managed to maintain a close formation of this type and was able to present such a wall of fire to approaching enemy fighters that most of them were discouraged and failed to press home their strikes. Unfortunately, the 101st Wing failed to fly a tight formation and received the brunt of the attacks. As a result, it sustained a heavy loss of 16 bombers. All types of enemy aircraft were seen, but most of the attacks came from Fi-190's and He-109's. Twin-engine fighters did not attack directly but paced the formations at a distance waiting to pounce on stragglers.

In spite of this violent opposition, 107 Fortresses, out of the 115 dispatched, managed to bomb the target with 521 x 1,000-lb. GP, and although all the bombs fell to the right of the aiming point, the results were considered satisfactory. Considerable damage to the central and east part of the assembly works was reported with heavy bomb concentrations in this area. Buildings hit included a hangar, the component
erecting shop, an assembly shop or flight hangar, the firing range, a paint shop or inspection hangar, a boiler house, and a coal dump. Numerous fires were started.\textsuperscript{7} approximately one-half of the factory was destroyed. It was estimated that about 50 enemy aircraft were shot down, with approximately 15 probables and 17 damaged.\textsuperscript{*} Four squadrons of Spitfires furnished withdrawal support, and a Typhoon squadron made a diversionary sweep.\textsuperscript{8}

Following the Bremen mission, attacks against GAF targets were suspended for almost a month. In the meantime there was a considerable increase in B-17's (from 198 to 331 with units),\textsuperscript{9} and the P-47 fighter became operational and went on its first bomber-escort mission 5 May 1943. However, the VIII Fighter Command remained relatively weak for some months to come; by July there were only 195 American fighter planes in the theater, and the bulk of the escort work was borne by the RAF.\textsuperscript{10}

Operationally, May was a much better month than April. A total of 2,677 tons of bombs was dropped, as compared with 1,130 in the previous month.\textsuperscript{11} Most of the targets were submarine bases and building yards and Luftwaffe installations. Some 11 of the objectives were specified in the CBO Plan. A total of 380 enemy aircraft were listed as destroyed of which VIII Bomber Command claims were 372-93-176.\textsuperscript{12}

The only direct blow during the month against GAF bases occurred on the 13th. On this date, a force of 169 B-17's were dispatched against

\textsuperscript{*}Claims cited can only be regarded as approximations. Not only are the figures suspected of being much too high, but there is also considerable disagreement among various theater sources. Thus in the mission referred to, the VIII Bomber Command claims 03 destroyed, 15 probably destroyed, and 17 damaged. The Tactical Mission Report for this operation cites 47-17-10 as claims.

\textsuperscript{8}SECRET INFORMATION
the Potez Aircraft Repair Depot at Leaulte and the Fort Rouge and Longuenesse airdromes at St. Omer in the Pas de Calais area. The Potez plant was currently engaged in fuselage manufacture and repair works for the Dornier 245 (Do-245) and evidently was considered an important target for it had been raided three times previously. It was also less than 200 miles distant from British bases. The mission was only partly successful, in spite of the fact that there was excellent fighter support and practically no opposition. The bombing at St. Omer was poor, but at Leaulte there were good concentrations on and around the target, and it was believed that considerable damage had been done to installations. Four bombers were lost and 11 enemy fighters were claimed destroyed.\(^13\)

Once again a long pause followed. Most of the emphasis was now being placed on submarine installations and it was not until 26 June that the Eighth Air Force turned again to strike directly at G.F. air-dromes. The results were not too successful. Two hundred and forty-six Fortresses were sent out against targets in France, but ran into bad weather and as a result 161 returned without dropping a bomb.\(^14\) A small force of 12 managed to drop 112 x 500-lb. GP bombs on the airdrome at Villacoublay which was a repair, maintenance, and assembly center for Junkers and Caudron aircraft, and a few planes bombed Poissy airfield. As a secondary effort, 39 heavy bombers attempted to bomb the field at Tricqueville. On all these missions, the results were negative.\(^15\) Two days later, a force of 43 planes dropped 688 x 300-lb. GP bombs on the field at Beaumont-le-Roger with a good concentration on the west dispersal area. The next day 74 B-17's made what was then considered a deep penetration to hit the Gnome et Rhone Aero Engine Works at Le Mans with poor
results. This operation closed what must be considered a rather disappointing month. Although the 582 bombers represented the largest number of American Liberators and Flying Fortresses yet assembled in the United Kingdom, the June operations fell below the level of May. The bomb load was some two hundred tons lower, and the claims were less. Losses were relatively high, being 6.0 per cent of the total bombers over the target, while the capacity of the Luftwaffe to produce seemed unaffected. The estimated production of the He-110 and the Fi-190 reached a total of 770 for the month, and there was evidence that July's output would be even higher. As long as this production level could be maintained, the loss of 788 planes which the Eighth claimed to have shot down in the second quarter of 1943 would not be seriously felt. No doubt this situation caused the authorities in Washington serious concern, for early in June General Arnold was pressing General Eaker to get more bombers into combat. However it was not until July and August that the POINTBLANK operations assumed the leading role in the CG. 

July was an important month in the war against the Luftwaffe, although the operations were handicapped by the transfer of three B-24 groups to another theater. This temporary loss will be considered in detail farther on in the chapter. In addition, weather during the first two weeks seriously interfered with the selection of high-priority targets and forced the bombers to concentrate on objectives nearer at hand. Nevertheless, in spite of this weather difficulty, the time was well employed, for the Eighth unleashed a series of vigorous attacks against Luftwaffe bases and repair centers. The official CGO report for
July characterized these raids on the German fighter force on the ground as "the first serious offensive of this kind to which he had been exposed." 22

On 4 July the first of these missions against GAF ground installations took place when Le Mans was visited by 103 bombers and the Heinkel III repair and component plant at Nantes was attacked by 61. Four planes were lost over Le Mans and three at Nantes; the total claims for both operations were 53-13-22 enemy fighters. 23 Weather prevented further missions until 10 July when the Eighth struck again at airfields. Plans to attack the important repair center at Villacoublay were forestalled by a heavy overcast, but the 1st Wing bombed Caen and Abbeville airbases with 31 and 30 planes respectively. The results were classified as good. 24

Uncertain weather conditions again prevailed over the interior of the Continent during the second week of July; consequently the mission planned for the historic 14th was against more airfields. Early in the morning, 101 bombers of the 1st Wing made the now familiar run to Villacoublay and blasted the target with a heavy load of 500 and 1,000-lb. G7 bombs. The results were excellent. The aiming point was completely covered with bursts and the target was demolished. Furthermore, a large number of planes were destroyed in the hangars. Smaller forces raidied the Miens/ Glissy and Le Bourget airfields with good results, although at the last place persistent attacks by enemy fighters caused some overrunning of the target. Although fully justified by results, this raid was more costly than the previous ones, and it was evident that German opposition was increasing. Eight bombers failed to return and the air battles were numerous and fierce as the high bomber claims of 65-35-51 indicated. 25
A new type of operation was carried out on the 16th when 36 B-26 bombers of the newly organized VIII Air Support Command assisted by 129 P-47's were dispatched in a sweep over occupied territory. This was the first mission staged by the Marauders since their disastrous operation against Ijmuiden on 17 May, and marked the beginning of a long series of attacks on G.I.F airdromes as diversions to the deeper penetrations of the heavy bombers.\textsuperscript{26}

With a slight improvement of weather conditions, the VIII Bomber Command planned deeper penetrations of German territory for the 17th and 25th,\textsuperscript{27} but conditions were not completely favorable until the 28th, and beginning with that date, three important missions were sent forth deep into Germany.

Mission No. 78, 28 July, was especially directed against Fw-190 production at Kassel and Oschersleben. Kassel was a high-priority target area with two important objectives for heavy-bomber attack. Of prime importance was the Fiesler Aircraft Assembly Works at Naldau, about three miles southeast of the center of Kassel. This factory was an important producer of the Fw-190 and at the time of the raid, it was believed to be producing 50 aircraft per month, or 22 per cent of the total production of this type. Five miles southwest of the city in the suburb of Altenbauna lay the Henschel Aero Engine Works, an important producer of the DB-601 and -605 engines used in the Me-109, and Me-110 and -210 twin-engine fighters. The output of the Henschel factory was believed to account for 25 per cent of the total production of these important engines. The main target at Oschersleben was the \textit{Ago Aircraft Assembly Works} situated on the outskirts of the town.
Its production was approximately equal to Fiesler's. Thus with good luck, the VIII Bomber Command might hope for the partial elimination of 44 percent of Fi-190 production.

Unfortunately, luck did not attend the 78th mission. Although carefully planned, things went wrong from the start. The 4th wing, which was involved in an elaborate feint toward the Iiel-Hamburg area to cause the enemy controller to divide his fighters, became involved in navigational difficulties and came too close to the Danish peninsula, which resulted in an attack by enemy fighters during the feint instead of forcing [them] to land and refuel as they have done in the past. The weather deteriorated as the mission proceeded and of the impressive force of 302 bombers dispatched, only 77 were able to bomb the targets assigned, and 17 struck opportunity targets in northwest Germany. The results at Kassel were fair. There was a heavy concentration of hits on workers' living quarters at the Fiesler plant, and another burst in the corner of the Spinifaser Textile Mill. Flak was intense, and of the seven bombers lost over this target, three were so destroyed. Oschersleben was attacked by 28 B-17's of the 2d wing, dropping 500-lb. GP and incendiary bombs. Although smoke and clouds obscured the aiming point, many hits landed in the target area and several buildings were destroyed. Flak was much lighter here, but enemy fighter opposition was correspondingly more intense and 15 of the Forts were destroyed. The total loss of 22 bombers made this one of the most costly raids to date. Three bombers were hit and destroyed by air-to-air bombing—a device often tried by the Germans but usually ineffective. This raid was one of the few occasions where it appears to have worked.
Total claims of 86-93-66, even though unduly high, indicate that the
Forts gave a good account of themselves, and the fact that two more
heavy missions were immediately prepared indicates that morale had not
suffered.\footnote{33}

The following day, a force of 95 bombers bombed i.e., 44, attacked
targets of opportunity, and 54 hit "Tarnemunde as a diversion for the
other forces. The target at "Tarnemunde was the "Ernst Heinkel Airframe
Factory, and it received a severe bombing. Direct hits were scored on
most of the main buildings including workshops, storage buildings,
assembly plants, offices, and boiler shops. A final estimate of damage
made on 4 August showed that 18 out of the 27 buildings had been hit
and 12 could be counted as destroyed or severely damaged.\footnote{34} This
achievement of the 4th Wing at "Tarnemunde showed what could be accom-
plished under favorable conditions with daylight precision bombing.

The last mission of the month was run off on the 30th. A force of
186 aircraft from the 1st and 4th Wings took off for a second mission
against the Fiesler plant at Kassel. This raid proved to be more
successful than the previous mission of 22 July; 131 bombers reached
the objective and the bombing was good. The 1st Wing seriously damaged
two buildings and set off a violent explosion causing a column of smoke
to rise 4,000 feet in the air. In addition to hitting the Focke-Wulf
assembly, bursts landed on the installations of the Spinnfaser Textile
Mill, the Reka Factory (special machine tools), the Bahr Ludwig Paper
Factory, and the Salzmann Factory (linen, sailcloth, and cotton weaving).\footnote{35}
Estimate of the damage caused by the 4th Wing was difficult because of
the intense smoke over the target, but hits were seen on a component

\underline{\text{SECURITY NOTICE}}
erecting shop and a machine shop, while a storage building was gutted and the blast effect was noticeable over the entire area. A total of 960 x 500-lb. GP bombs and 603 incendiaries was released over the objectives. Perhaps owing to a deep penetration by P-47's to cover the withdrawal from the area, losses were no more than expected. Twelve bombers went down and claims of 48-13-32 were made.

Although German single-engine fighter production reportedly reached 810 planes per month in July, the beginning of this second phase of the CEQ marked the first time a really concentrated effort was made to reduce German aircraft expansion. During the next month, the output of Focke-Wulf and Messerschmitt fighters was to fall to 665, justifying the conclusion that "the major effect of the bombing program has been not so much to force production below previous levels as to halt in its tracks an immense fighter aircraft expansion program." In addition, the Fighter and Bomber Commands listed in their records 575 enemy planes as shot down during the month. Despite a serious shortage of heavy bombers and the crews to man them, operations showed a great increase over June. The bomb load of 4,103 tons on enemy targets was delivered in 1,015 sorties at a cost of 113 planes, or a 7.3 per cent loss out of planes reaching the objectives.

The first mission of August against German fighter production was remarkable for two reasons: it was a mission against a new target, and it was not conducted by the Eighth Air Force. The story of Operation JUGGLER on 13 August brings the Ninth Air Force into POINTBLANK missions.
for the first time, and also marks the first attack on the great Messerschmitt complex at Nien Heustadt just south of Vienna.

The Ninth had been engaged in the North African campaign and had then taken part in the Sicilian invasion. For this campaign, the two B-24 groups which constituted its heavy bombardment force were augmented by the 93d, 41st, and 389th Groups (B-24) from the VIII Bomber Command. These five groups participated in the U.S. Y operations until 19 July when they were diverted to prepare for MB-140, i.e., the attack on the Floesti oilfields. This famous mission was carried out on 1 August and immediately afterwards the task force was ordered to prepare for a coordinated attack with the Eighth Air Force on Regensburg and Nien Heustadt.

This mission, known by the code name of JUGGLED, had been planned for some time. Behind the planning lay the growing concern of British and American authorities at the continued expansion of the Luftwaffe's fighter strength in the West, and a desire to strike at important centers of the air industry such as Regensburg and Nien Heustadt which were still unacquainted with American precision bombing. Furthermore, both General Arnold and Lt. Gen. Carl Spaatz, commander of the U.S. Army Air Forces in the North African Theater of Operations (C.A.O.), were anxious to boost German industry from other bases than those in the United Kingdom. Both of the had felt for some time that operations from Mediterranean bases against areas of the Reich out of range of the VIII Bomber Command were desirable and logical. Since most of the attacks on aircraft factories had been directed against Focke-Wulf centers, it was time to turn to the great Messerschmitt complexes which had produced an estimated
570 He-109's in July. As originally planned, JUGGLER was a simultaneous
attack on two centers: the Eighth was to assault Regensburg at the same
time as the TICO/W2 task force, or what was left of it, was striking
north from the ETO to Wiener Neustadt. For a while there was some
chance that JUGGLER might be given a higher priority than TICO/W2, but
since both Marshall and Arnold were opposed, it was finally decided
to mount the Floesti mission first, and run off the combined attack as
soon as repairs had been made and the crews had been rested.

As previously indicated, the Romanian objectives were attacked on
1 August and thereafter JUGGLER was set for 7 August. However, weather
conditions over northeastern Europe interfered with the Eighth's attack
on Regensburg, and after several postponements it was decided to give
up the idea of a coordinated attack and to allow either force to stage
its mission as soon as conditions were favorable. As a result the
Ninth carried out its assignment on the 13th, four days before the
Eighth was able to move. At 7 o'clock in the morning, 114 B-24's led
by Brig. Gen. E. J. Timberlake took off from the Ninth's African bases
and started on the long, 1,200-mile trip to Austria. In spite of two
extra bomb bay tanks each Liberator, the formations would not be able
to return to their home bases, but were to land at Tunisian fields for
preliminary interrogations and refueling.

Although a large number of the bombers aborted—32 returned to
their bases before reaching the target and 21 others failed to be b for
mechanical or other reasons—the 61 Liberators that reached Wiener
Neustadt gave a good account of themselves.
Henschel & Sohn Plant (heavy engineering) were well covered with curtains. Only one bomber was lost and two enemy planes were shot down. A photo reconnaissance made on 10 August revealed the extent of the injuries done to the installations. At the Henschel plant works two assembly shops out of four were badly damaged, several stores buildings were hit, and one large flight hangar was destroyed. Although it was three days after the attack, about 20 destroyed or damaged aircraft were seen on the ground. At the Argo-Hiller-uch factory, all the large buildings showed hits, the central group of machine shops and the power station being the most severely affected. Many of the buildings showed extensive roof damage. Some of the bombs missed the Henschel plant and fell into near-by fields, but one long stores building received a direct hit, and a workshop was one-third destroyed. Although the original estimate that He-111 production at Henschel plant had been cut 50 per cent now seems a little high, there is no doubt that considerable damage was inflicted on a complex that had hitherto been immune from attacks.

Because of this, and because it was the first strategic mission into the Reich from the Mediterranean, operation JUHELI may be considered a history-making event in the development of the great air offensive against the Luftwaffe.

While the preparations for JUHELI were underway, the eighth was waiting for clearing weather. On 12 August, conditions had permitted a raid on Ruhr targets, but it was not until the 17th that a really deep penetration was possible. Therefore, the VIII Bomber Command had to content itself with short runs against airfields close to the Channel coast on the 15th and 16th.
On the first operation, 327 bombers were dispatched to attack the G.F bases at Vlissingen, Foix, Valenciennes, Arras, Lille, and Vitry, while the B-26’s of the VIII Air Support Command carried out diversionary feints. Only 2 bombers were lost. The results of the bombing at Vlissingen, Lille, and Foix were only fair, but were more successful elsewhere. At Valenciennes the entire airfield was blanketed with bursts, and hits were scored on hangars, workshops, barracks, and a runway. The entire northeast dispersal area was well covered with fragmentation bombs. Equally satisfactory bombing took place at Arras and Vitry.

One interesting feature of this mission was an elaborate double feint which was carried out by the 4th Wing. Previously, the formations would make a diversion up the Channel toward the enemy coast and then proceed to the target. Securing aware of this trick, the enemy had formed the habit of holding back his fighters and only releasing them when the bombers made their second turn toward the coast. Therefore, on this mission, it was determined that the 4th Wing should make two threats toward the enemy coast before beginning the actual penetration of the enemy air. This plan worked successfully. At the second feint, the G.F reacted vigorously and some 70 fighters took to the air. However, they wasted their gasoline rushing out to meet the 4th Wing, and by the time the real penetration was taking place, the German fighters were on the ground refueling. The fighter escort was unusually effective on this operation and won special praise from Maj. Gen. Frederick L. Anderson, Jr., commander of the Eighth’s bombers. Another new technique used on this significant mission was the employment of fragmentation and light GP bombs as the best combination for inflicting the maximum destruction on an airdrome. This had been tried by General Spaatz with
considerable success in the Mediterranean theater, and was found to work equally well in northwest Europe.\textsuperscript{54}

The next day the attack on airfields was continued. The 1st Air Wing went to Le Bourget and bombed with very good results, some 600 bursts postholed the landing field and causing severe damage to repair shops, hangars, administration buildings, and barracks. The results of the 4th Wing's attack on Poix and Libreville/Oruçet airdromes were considered fair. Both targets were attacked by a total of 236 bombers dropping 397.35 tons. Only 4 bombers were lost and claims of 29-3-11 were made.\textsuperscript{55}

The build-up of fighter strength in the theater to 298 P-47's with 586 crews was beginning to make possible a more effective escort. Commenting on this mission, General Anderson wrote:\textsuperscript{56}

It is felt that this operation is an excellent example of fighter-bomber coordination. The 1st Wing penetrated enemy territory through an area which is very heavily defended by fighters and reported only 59 encounters, with the loss of one a/c to enemy fighters. This number of encounters is quite low and it is evident that the fighter escort of P-47's was effective.

By this time, the weather had improved to the extent that a deep penetration could be attempted, and consequently the Eighth planned to carry out the mission against Regensburg which had originally been a part of the JUGGLER plan. Since the distance was great, the 4th Air Division assigned to the Regensburg attack was to continue across the Mediterranean and land at bases in North Africa. At the same time, the 1st Air-Division was to attack the relatively closer target of Schweinfurt, the center of German ball-bearing manufacture. Three-combat wings were assigned to the first task force, and two were assigned to the second.\textsuperscript{57} To be able to mount major attacks against two important, heavily defended targets in the same day marked a milestone in the
history of the Eighth Air Force. Nothing like this had been done before, and to carry out this double mission strained the Bomber Command to the limit of its resources. Out of the 613 B-17's and the 555 crews in the theater,* 376 Flying Fortresses took the air on the morning of the 17th.58 A heavier commitment could have hardly been made.

Realizing that this double attack would probably cause a great air battle, General Anderson and his staff laid their plans carefully. No less than 18 squadrons of Thunderbolts from the VIII Fighter Command and 16 squadrons of RAF Spitfires were to provide penetration support for the formations and withdrawal cover for the 1st Division's bombers. Diversionary attacks were to be made by the medium bombers of the VIII .30 on Bryas/Sud and Poix airfields, and RAF Typhoon bombers were to hit the airfields at Poix, Lille/Vendeville, and Steensdrecht in order to hold down the German fighters in this area.59

It had been originally ordered that the divisions should be dispatched 10 minutes apart, but as the time for departure drew near, the unstable weather made this arrangement impossible. It was then decided to let the Schweinfurt task force take the air three and one-half hours later than the formations headed for Regensburg and thus give the fighter escort ample time to land, refuel, and get into the air again for the second force.60 Unsatisfactory as this arrangement may now seem, it must be remembered that bad weather had dogged the Eighth for some time, and on the 17th conditions along the entire route as well as over the targets were the best that had been forecast for two weeks. Dangerous

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*It will be remembered that all but 10 of the Eighth's effective B-24's were still in the Mediterranean area following Tidalwave and Juggler.
as it was to dispatch the two task forces separately, it would have been more dangerous to send them without escort, and the growing importance of the two targets did not permit an extended delay.\textsuperscript{61}

The mission took place against intense opposition. From Antwerp to the Alps the squadrons were under almost constant attack from about 200 German fighters drawn from all parts of the Reich, one group coming into the fray as fast as another was withdrawn. Near Regensburg, twin-engine fighters with desert camouflage were seen, while some fighters were called in from Holland to the Rhineland and every type of fighter the GAF possessed was thrown into the struggle. As the battle progressed and the bomber formations plowed deeper and deeper into Germany, the tension among the German fighter pilots mounted. Allied interceptors were able to hear a strange medley of warnings, exclamations, and laments. Calls of "close up," "look out," "formation coming up behind," "fighters to starboard" passed rapidly back and forth among the German planes.\textsuperscript{62} At 1636 hours, when the Thunderbolts and Spitfires entered the melee to cover the retiring 1st Division, the combat reached its height. Claims of strikes and kills were heard over the German radio, mingled with cries of "parachute!" "ha, down you go you dog," and after almost half an hour's combat, a final gash "Herr Gott Sakramant!"\textsuperscript{63} By 1700 it was over.

The bombing was successful, but at the heaviest cost the Eighth Air Force had suffered. Out of the 303 bombers which attacked the targets, 60 were shot down—a loss of 19 per cent of the attacking force; 36 had gone down at Schweinfurt and 24 at Regensburg.\textsuperscript{64} However, the damage inflicted had been great. At Schweinfurt, the three roller-
bearing factories were hit several times. In the Kugelfischer Werke, four large machine shops and a storage building were partly destroyed and an office building was gutted. At the Vereinigte Kugellager Fabriken Werke I, one unidentified building was severely damaged, and at Werke II some machine shops were badly injured. At Regensburg, the results were even better. Within the target area 62 installations were damaged and the number seriously damaged or destroyed came to 13 workshops, 5 office buildings, 19 unidentified structures, and 17 others, including a final assembly shop, a gun-testing range, 3 light-metals buildings, a hangar for engine installations, and 10 living quarters. Reconnaissance photos showed 51 single-engine aircraft on the field of which 37 were probably destroyed or damaged. Total claims for destroyed, probably destroyed, and damaged aircraft were set at the very high figures of 290-32-99. Even assuming that these are probably extreme, there can be little doubt that the Luftwaffe paid a steep price for the afternoon's entertainment.

After this great effort, the VIII Bomber Command relaxed while missions were carried out against Luftwaffe airfields and ground installations. A mission against Dutch and Belgian fields on the 19th was badly hampered by weather and amounted to little. On the 24th, Villacoublay was attacked with excellent results, and Bordeaux, Briveux, and Conches were hit less successfully. The attack on Bordeaux was made by the units of the Regensburg task force who were returning from their shuttle trip to North Africa; a cloud over the city prevented accurate use of the bombsights and the results were only fair. Three days later the 1st Division sent 224 aircraft to attack the aeronautical facilities station at Chattan, France. Although 37 planes failed to bomb,
the results were considered excellent. Only four bombers were lost.\textsuperscript{70}
On the last day of the month, finding primary and secondary targets covered by cloud, a force of 106 bombers assailed the Amiens airdrome as a target of opportunity. The results were excellent. Five dense concentrations covered the target with hits on all the main installations, and some bursts on a railroad marshalling yard near the airfield.\textsuperscript{71}

In the war against the Luftwaffe, August must be regarded as one of the more successful months. Although the bomb tonnage was a little lower than July's, this was overshadowed by the fact that the Air Ministry estimates showed a considerable drop in GAF production. Instead of advancing still further toward the 1,000-plane-a-month goal, the output of Messerschmitt and Focke-Wulf fighters fell from a high of 810 to 665 during August. For the first time since the CBO was initiated, "e-109 centers were attacked successfully, and the production of this fighter was cut from 570 to 435 during the month.\textsuperscript{72} In spite of heavy casualties on the Regensburg-Schweinfurt operation, total losses for August were slightly less than July, dropping from 7.3 to 7.0 per cent of the planes actually attacking.\textsuperscript{73}

The operations against airfields during the last week of August were connected with an elaborate plan known as operation STAMPE. This was a combined operation designed to force the Luftwaffe to commit a large part of its forces to battles of attrition, so that the maximum number of enemy planes could be destroyed in the air and on the ground. The core of the GAF opposition to the daylight raids was the some 680 fighters stationed in northwest Germany and Holland, and approximately 170 fighters based around Lille, Poix, and the Beumont-le-Roger/Evreux.
The bombing of these fields in July and August had had a tendency to force the Luftwaffe back from the coast, and the fields at Amiens, Abbeville, and Courtrai may have been evacuated before the commencement of ST.IMEY. At any rate, it was hoped that the elaborate maneuvers planned as a part of the operation would force the G.F "to stick its neck out" and enable the Allies to win the air superiority so important to further land and air movements against the Continent.

The plan was divided into 3 phases: (1) the preliminary phase from 16 to 24 August, (2) the preparatory phase, 25 August to 8 September, and (3) a culminating phase on 8-9 September, when with the cooperation of naval units, an actual invasion of the Continent would be simulated from British ports. It was believed that this ruse would bring on a large-scale air battle. The organization responsible for R.A.F participation in ST.IMEY was No. 11 Group, which was strongly reinforced by squadrons from Nos. 10, 12, and 13 Groups being absorbed into the No. 11 Group Sector. Also temporary operational control of squadrons from 33 and 34 Groups was given to No. 11; medium bombers (No. 2 Group) and the Coastal Command's antishipping Beaufighters were likewise assigned to the air command for the operation. For 9-day, additional reinforcements were to come from Nos. 10 and 12 Groups. The R.A.F participation was largely limited to the medium bombers of the VIII B.C.; with whatever assistance the strict priorities of the VIII Bomber Command and the weather would permit it to render. As it later turned out, weather was far more of a problem than priorities or the Luftwaffe.

During the preliminary phase, action centered largely against the
enemy airfields. A total of 21 attacks was made and 45 enemy aircraft destroyed at a cost of 23. The enemy reaction to the opening phase of "Sticky" was cautious, and bad weather slowed down the tempo of attacks. During the big operation against Legensburg and Schweinfurt, the "Sticky" task forces ran diversionary raids against Luftwaffe bases, as previously noted, and shot down 15 German planes for a loss of three. All together, 6,000 fighter and bomber sorties were flown during the nine days that this phase lasted. 79

The preparatory phase which began 25 August was intended to speed up operations with blows against airfields, industrial targets, and military installations in and related to the Pas de Calais area. However, bad weather seriously interfered. Of the 42 operations planned, 14 were canceled outright, 11 abandoned, and 3 seriously curtailed, leaving only 15 which were flown as planned. 80 As actually carried out, the preparatory phase was divided into two subperiods: (1) from 25 August to 3 September; and (2) from 4 to 8 September. During the first subperiod, 20 attacks were made on airfields, with the heaviest blows falling against Beaulieu-la-Roche, Trieuxville, Sainct-Pierre, and Bure. Since photo reconnaissance revealed that the enemy was basing fighters at Cambrai, Beauvais, and Lille/Nord, the last two were attacked. 81 Toward the latter part of this phase the heavy bombers of the VIII Bomber Command contributed to the plan by attacking the fields at Denain and Arras on 2 September, and the following day by visiting St. Pierre de l'Ire, Ivreaux, Houilly-sur-Seine, Voulan-le-Tuereaux, and Nieppe.

This last bomber sweep of airfields was a considerable mission involving 293 bombers dropping 2,736 x 500-lb. Of bombs. One plane was lost...
The attacks were relatively ill-coordinated: only 24-July. The reaction of the FAA continued to be cautious, to say the least. 62

Beginning with the 4th, the emphasis of the attacks was shifted to
marshaling yards which had to be destroyed to affect the area of the
supposed landings. In this way, we did achieve a slight tendency to
react and lost 13 planes as a result. It was believed that the Germans
had used long-range bombers for laying mines in the Channel on the night
of 3-4 September, and when the Royal Navy conducted a mine sweep, this
produced a German air reconnaissance—the first one carried out during
32-17. 63 With overcast conditions and the bombings of Germany
difficult, the problem of locating the airfields was one of the main causes to the assistance
of the FAA operations and to see the airfields at Calais/St. Hubin,
Stenckes, and Calais/Frétoy on 6 September. Because of clouds, the
results were unsatisfactory. The next day three operations were run off
again at the Brussels/Bordeaux circuit depot, the Porren/Limay airfield,
and the aeronautical station at Toulon. 64

Meanwhile, during several weeks prior to the final phase of ANFLY,
large bodies of troops had been moved into the southeast counties and
motor transport vehicles and aircraft personnel began to assemble near
assault craft designed to simulate the "triangle" formations of
an invasion fleet, between Southampton and the Thames estuary. Large
numbers of ships began to appear at various anchorages and ports. As
the last phase began, the major problems to relieve the German long-
range runs on the French coast which might have thrown the proposed
operation into considerable hazard, consequently, heavy and medium
aircraft were to neutralize these gun positions. Although

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the last phase was to start during the night of 7-8 September, weather
forced a postponement until the night of 8-9.25

The first attacks of the final phase were made by bombers against
seven battery positions while the fighter-bombers attacked beach defenses
in the Juno sector. These attacks were successful and were almost un-
impeded. At about 0700 hours, the naval assault force, under an umbrella
of shells, set out from Dunkerque and swept down the Channel toward Le
Houquet.26 About an hour later, the Ninth Air Force unleashed a heavy
simultaneous attack against the seven principal airfields in northwest
France. Eighty-seven bombers were sent against Saint-Omer-sur-Dives, 13
to Beauvais/Aire, 27 to Lille/Fersac, 10 to Lille/Valenciennes, 35 to St.
Omer, 20 to Abbeville/Bracq, and 50 to Huty-en-Artois, making a total
of 377 bombers. Only two were lost and since the Luftwaffe's opposition
was light, claims were only 15-2-7.27 While this was going on, the
convoy proceeded down the Channel till 0900 when the Escorts laid a
smoke screen and under cover of this, the Fleet turned about and landed
at Dunkerque near 1100. The enemy air reaction to the naval maneuver
was nil.28

In summing up the results of this long, carefully planned operation,
the official report made it quite clear that all attempts at deception
had failed. The enemy was never deceived into thinking that a serious
landing was attempted, and consequently made no attempt to use his
fighters against our land or sea operations. Once again it was made
clear that only deep penetrations to vital industrial targets would
bring the Luftwaffe out in force. Although the Germans did reinforce
their fighters in the Beauvais and Lille areas, these measures were
mainly precautionary and did not cause any fundamental change in their disposition of fighters. In the words of the final report:

... it is beyond the scope of this Report to consider the reasons why the one's appreciated that a full scale landing was not intended. It is suggested, however, that this may have been due either to his having had information that the extent of the Army participation in this operation amounted to little more than an administrative exercise ... or else to a firm conviction that there could be no serious threat of invasion from this Country at the present time. The enemy's almost complete lack of overland reconnaissance, both prior to and during this Operation lends colour to either of these hypotheses.

In the vernacular, STICK was a flop.

After a pause of a week, the offensive against German airfields was resumed. On the 15th four task forces were dispatched to attack German industrial targets in France and certain airbases. Ninety-three bombers of the 1st Division struck at the aircraft storage and repair depot at Romilly-sur-Seine with excellent results, and the 2d Division bombed the Chartres airfield as a last-resort target. The following day 295 bombers were dispatched in a sweep of targets from Brittany to the Bay of Biscay. Among the objectives were the Lanteau-Chateau Dougou airfield and GIP installations at La Rochelle/Laleu and Cognac/Chateauaubernard. Claims were 44-5-13 at a cost of 11 heavy bombers. Again on the 23d the Ports were out, this time against certain Breton airfields. Vannes/Couzon was bombed by 55 planes, Kerlin/Bastard by 53, with good results for both raids, and Hennes/St. Jacques was hit by 19 with only fair results. The last counter-air force operation of the month took place on the 26th when 40 bombers blanketed the Beins/Champagne airfield with II and IV, causing much damage.

September was a month of greatly increased operations. A total of...
2,085 bomber sorties reached their targets for the relatively low loss of 4.7 per cent of the attacking planes. Bomb tonnage reached a new high of 5,743 tons for the month. On the other hand, claims were considerably lower, 303 destroyed, as compared with 457 for the previous month. This is probably because so many of the missions were against coastal airfields which were relatively undefended. It is also probable that the Luftwaffe was beginning to follow a policy of conservation of fighters, as indicated in the reaction to STEY, and did not wish to commit its forces to battle unless the stakes were high.

At the same time, a good many of the missions of September were relatively small affairs; yet the build-up of strength in the theater was greater than ever before.* This problem seems to have troubled General Arnold, for on 25 September he cabled Gen. Ira C. Baker, commander of the Eighth Air Force, that "we obviously must send the maximum number of airplanes against targets within Germany. I know you will agree that the minimum number must be kept on the ground at our bases or in reserve." He went on to say that he was under constant pressure to explain why we did not use massive flights of planes since we now had enough to put 500 in the air. And the next day, Arnold again cabled him to get the facts about German aircraft production, especially the effects of the August bombings.96

General Baker's reply was reassuring. He believed that the German single-engine plane production had been materially reduced by the Eighth's raids and stated that "an educated guess indicates further

*There were 74 heavy bombers with 871 crews, and 422 fighters with 889 crews. Statistical Control."
reduction in He-109 production for September. He thought that shifts in location plus the withdrawal of planes from the Eastern Front might offset the destruction of the older plants. An increase of strength was probably to be expected in the Mediterranean area, but he believed that the new units would be made up of green crews. A few days later, after a raid of 2 October on Iinden with exceptionally light losses, he was able to cable General Arnold that the weak German fighter attacks on our formations were due to a shortage of single-engine fighters caused by our attacks on German fighter factories.

The Iinden raid was soon followed on 4 October by an extensive mission involving four task forces made up of 301 bombers. One formation of 33 B-17s attacked the St. Louis/Robinson airfield as a last-resort target, but little damage was done. Bombers from the 1st Division attacked the Vereinigte Deutsche Stahl Werke at Frankfort. This plant produced more than 50 per cent of the metal propellers used by C.P. fighters, reconnaissance planes, and bombers. A photo reconnaissance taken a few hours after the raid showed the plant still burning, and between one-half and one-third destroyed. This mission marked the debut of the B-24H bomber which, according to General Eaker, "gave a good account of itself in its first combat." From all the forces attacking, 16 heavy bombers were lost. The preliminary claims were 56-24-22, but these were later re-evaluated and became 27-24-47.

On the 8th the heaviest attack up to that time was carried out against Germany. Four air task forces, involving 399 Fortresses and Liberators went out against various targets. One force of 53 B-17's
dropped 180 x 500-lb, GP and 720 x 100-lb, IB bombs on the I.essar airframe (F.) plant at Brezen. Unfortunately the bombing was not good on this occasion. The strike photos showed two possible hits with most of the bombs falling outside the target area. Claims for all the task forces reached the very high figure of 157-22-55 for the heavy loss of 30 bombers. However, an RAF raid in the same area that night sustained a loss of three bombers, showing the value of cooperative missions.\textsuperscript{104}

The story of the 113th operation on 9 October is tersely and neatly summed up in the Narrative of Operations: \textsuperscript{105}

Five air task forces of Fortresses and Liberators made the deepest penetration into Germany since the beginning of operations by VIII Bomber Command to successfully attack important naval and industrial targets in eastern Germany. Bombing results were excellent . . . . 28 heavy bombers failed to return and claims against e/a are 122-29-61.

The 1st Division sent 115 B-17's to bomb the Arado plant at Anklam, a major producer of F-190 component parts which were assembled at Tutow. The results were excellent in spite of the loss of 15 of the big planes. Concentrations of HE and IB bombs covered the entire factory and every major unit of the plant sustained damage.

The 3d Division dispatched 100 B-17's against the important F-190 assembly plant at Marienburg which was then supposed to have inherited most of the functions previously carried out at Brezen. This raid was one of the most effective of the year. All but four of the dispatched planes attacked the target from the relatively low altitude of 11,000 to 13,500 feet yet only two of the Fortresses were lost. The plant was practically destroyed with hits on all major units except one assembly shop at the north end. As the planes departed, the entire target was a mass of smoke and flame; three hours later the fires were still so...
intense that photo reconnaissance was impossible.\textsuperscript{106}

The day following the mission, General Iaker cabled General Arnold the following message: "Have just seen first P-38 photos of yesterday's attacks; most encouraging. Fighter factory at Marienburg undoubtedly destroyed. It will be a better example of pin point bombing, a better concentration than Regensburg. Looks like a perfect job. Fighter factory at 

... received excellent concentration and principal buildings burning ... Believe you will find October 9th a day to remember in air war. Prime Minister is sending message to crews.\textsuperscript{107}"

Two years later when Hermann Goering was being interrogated as to the effects of our bombing offensive, the August raids on Regensburg and Niem Neustadt and the October raid on Marienburg still remained in his mind as among our most successful efforts.\textsuperscript{108}

Five days later, the Eighth achieved another outstanding mission with its follow-up attack on Schweinfurt. As previously described in this chapter, Schweinfurt had been successfully bombed on 17 August. By this time, it was assumed that repairs were nearly completed and the target ready for a follow-up attack. Furthermore, it had been observed that deep penetrations against vital objectives always produced a violent Luftwaffe reaction and it was hoped that in defense of this important ball-bearing plant, the G.F. would commit large forces to the air battle.

These expectations were fulfilled. As the 231 bombers of the task force* moved steadily across northern Europe, the German fighters were assembling, waiting for the moment when the escorts would turn back and

\*This figure does not include a formation of 27 planes which was unable to assemble with the other groups owing to weather, and therefore flew a diversion in the direction of Holland.
leave the big planes open to attack. As the groups passed over the
Machen-Duren area, the fighter escort left, and the first German attack
squadrons dived into the bomber formations.\textsuperscript{109} The first wave of bombers
was hardest hit. Approximately 300 enemy planes attacked the squadrons
using a combination of single-engine fighters coordinated with twin-
engine rocket-firing planes that was very effective. Out of this first
wave 45 bombers were lost and only 101 were able to reach the target.\textsuperscript{110}

In spite of this fierce opposition, a combination of improving weather,
and a clever feint away from the target that threw off the swarms of
German aircraft, enabled the two attacking formations to bomb with
considerable success. The main installations were hit and many fires
were burning when the bombers left the area. In the V.I.F. Works I all
the main buildings in the southwest end were struck by fire while seven
buildings in V.I.F. Works II were more than half destroyed. At the
Deutsche Star Hangelhalter plant which manufactured ball-bearing cages,
the storage buildings were completely destroyed and the machine shops
were damaged. According to the Narrative of Operations of the Bomber
Command, 75 per cent of Schweinfurt's productive capacity was wiped out.\textsuperscript{111}

The destruction of 60 bombers marked this operation as one of the costliest
missions carried out, but this loss was partially offset by the very large
preliminary claims of 1,376-27-89; these were later sustained\textsuperscript{8} by the final
evaluation.\textsuperscript{112}

In spite of the heavy losses, it was soon recognized that the
Schweinfurt raid of 14 October was an outstanding mission. General Arnold

\textsuperscript{8}In spite of this apparent confirmation, it is suggested that the figures
are still much too high.
abled that he was particularly gratified that morale and enthusiasm
were still high. "Convey this message to your command," he wrote Eaker,
"... the cornered wolf fights hardest and ... the German Air Force
has been driven into its last corner." Secretary of War Stimson sent
his "heartiest congratulations and deep admiration ... to all ranks of
the Eighth Air Force," and General Marshall stated that he was
"tremendously impressed with the apparent complete destruction of the
Schweinfurt Ball Bearing Plant" which, he believed, would have an effect
on the general German position comparable to that of the Floesti mission.

The air battle of Schweinfurt was the last counter-air force opera-
tion of a month which, according to Eighth Air Force claims, was the
most costly yet endured by the Luftwaffe. In all, 370 enemy aircraft
were destroyed (Eighth Air Force claims alone came to 731-91-71), but
American losses were far from light. In fact, the 156 heavy bombers
destroyed constituted 9.7 per cent of the attacking forces, and made
October's air operations the most costly of the European war. The
actual monthly loss of bombers was destined to go much higher—in April
of 1944 it would reach 420—but at no time would the percentage of loss
come to October's figure. From this time on, the build-up of strength
would always keep well ahead of attrition.

As the C.P. defeated? Could it continue to withstand such heavy
pressure? General Arnold, at least, was hopeful that the end of serious
resistance in the air could not be long deferred. "From my viewpoint,"
he cabled Eaker, "it appears that the past month's operations on all

*This term does not include forces dispatched, but only those that
actually reached the target area.
frosts may indicate that the German Air Force is on the verge of collapse. At this time, all types of defensive aircraft may mean the Luftwaffe is staving off a crisis. In reply, General Eaker stated that he saw no definite indications of collapse, but such evidence of strain of the fighter production 30 to 40 per cent by the end of November, and reserves were very low. In the whole, his outlook was optimistic: "It can be stated with certainty that the completion of B-17s as scheduled will produce the desired result."

With the close of October, the second phase of the GB2 raids to an end. As originally scheduled, it called for a larger strength of 1,192 planes providing an average striking force of 550. Each basis of the attack in this phase was to consist of 3 in. The objectives against the German aircraft industry within a radius of 150 miles from bases in the United States. Actually, as executed, this phase of the GB2 sometimes surpassed, at other times fell considerably behind, the schedule. Though in the initial and later phases, the average radius was considerably excessive, a large number of missions had been close to the Channel coast. German aircraft factories had been hit, but since weather often interfered with deep penetration, a great many of the bombardies had to be content with bombing single-aircraft in northern France, Belgium, and Holland. Then too, a large number of heavy and medium bombers had been diverted from the visual targets to the unsuccessful GB2 operation. Perhaps the greatest deviation from the schedule was in the build-up of planes in England: the 779 American B-17s present (with units) in the United States by the end of October.
was also from the 1,112 dates upon which the second phase of the program was predicted. As a result, none of the operations were near the 400,000 mission which it was hoped would be the average size raid in the July-August period. In pointing out where the is fell short of what its creators expected, it is only fair to state that any obstacles encountered could not possibly have been foreseen when the air offensive against Germany was first planned. Even so, these problems were, and not the, were not all of the samples of the following chapter.
Chapter III
RECEIVING THE PRESSURE AGAINST THE GAF

For convenience, the last chapter dealt almost entirely with the early operations of the Fifteenth program, and it was therefore necessary to omit an account of some of the problems which the Twelfth Air Force faced in trying to pull to the established plan of operations. It is now time to consider them. Briefly, there were three major factors that affected the progress of the attack on theLuftwaffe during 1943. They were: (1) the diversion of men and equipment from the Twelfth to other air organizations, (2) the slow build-up of American air power in the theater, and (3) the high cost of the air offensive.

From the very beginning, the Twelfth was called upon to contribute to the build-up of new air forces while it was still trying to set up and carry on its own organization and set up and continue its operations. Shortly after the Twelfth arrived in England, the North African invasion was decided on, and much of the planes and material which were beginning to arrive in the British Isles had to be transferred to the Twelfth Air Force. The extent to which this transfer held back the Twelfth's operations was doubtless great, and the effects were felt for many months to come.

As late as June 1943 there were only 532 heavy bombers on hand with units in the VIII Bomber Command.\[1\]

*For a discussion of the build-up of the Twelfth, see XII-5, 29-30.*
In spite of the fact that to carry out the 500 required B-44 bombers
in the theater by mid-1943, the Eighth was at this time called on to
make another diversion and was ordered to send three B-24 groups to rein-
force the Ninth Air Force for TEDDI and JUGGLER. As a result, be-
tween 26 June and 2 July, the 41st, 93d, and 359th Groups were dispatched;
the first two were old, experienced units, while the 359th was new and
untried. General Spaar and General Devers, ATO commander, were not
happy over this latest diversion and the latter urged that the groups
be used only for the Floesti mission and then returned immediately, since
their loss reduced the bomber strength by one-fifth. However, the uses
for heavy bombers were legion, and it proved difficult to get them back.

After participating in the TEDDI operations from 2 to 1 July, the
groups were then assigned to TEDDI, presumably to be followed by
JUGGLER. At this point, Spaar and Devers, assisted by Air Marshal
Sir Charles Portal, attempted to have JUGGLER given top priority over
the Floesti mission. They felt that the RAF fighter factories were of
"paramount and highest priority" and that such targets should have
precedence over all others. At the same time, they strongly urged that
the B-24's be returned as soon as possible.

Both Generals Marshall and Arnold did not want to see TEDDI
hampered in any way, but the views of the American and British air
authorities were passed on to General Eisenhower on 19 July and his
opinion was requested as well as the views of Tedder and Spaar. On
the following day, Eisenhower realized with a compromise suggestion.
Like Marshall and Arnold, he did not want to abandon TEDDI, especially
after all the preparations involved. Since he believed greater losses
might be expected from the Romanian raid, he suggested that JUGGER
might come first since it would be the easier. While he appreciated
General Eisenhower's desire to get his groups back, he felt some things were
more important, such as follow-up raids on Floesti. The question was
finally brought before the Combined Chiefs of Staff and on the 23d they
cabled their decision to Eisenhower: TIDEWAVE was to have first priority,
but the attack on the fighter factories was to take place as soon as
arrangements could be made with the Eighth Air Force.

This issue was now settled, but while the three groups were in
North Africa preparing for the attacks on Floesti and Mener Leustadt,
a new demand was made on the Eighth's bombers. The Sicilian campaign
was in full swing, and there was a great need for all available air
power. Consequently, General Eisenhower requested four heavy bombardment
groups from the Eighth Air Force. General Marshall forwarded this re-
quest on to General Levers who objected strongly. The coming period was
highly important, as it was the phase of the SBO in which the G-11 produ-
duction was marked for destruction, and Levers felt that the Eighth had
at last reached a size where effective coordination with the RAF would
be possible. In addition, he cited the successful raids on submarine
installations and warned that the bombers could not operate outside their
own theater at the maximum efficiency. For these reasons, he urged
Marshall not to divert the Eighth from its official task. Evidently
this appeal had some effect, for the Chief of Staff suggested to both
Devers and Eisenhower that perhaps medium bombers could be substituted
for the heavy groups. To this suggestion, Devers voiced similar
objections and added that the mediums had special commitments to STANLEY
which made it desirable to keep them in the theater.\textsuperscript{11} The argument was again terminated by the Combined Chiefs of Staff in a decision that was favorable to the air strategists and the CBO, and General Eisenhower’s request was disapproved.\textsuperscript{12}

So far the Eighth, with the backing of General Devers, had been able to hold its remaining forces together for the PRIMARY offensive. However, owing to the heavy losses at Kisoji, General Arnold agreed that some additional B-24’s would have to be furnished General Erereton for JUGGLER\textsuperscript{13} and on 5 August Devers cabled Washington that he was sending six and possibly seven B-24’s and crews to the Ninth.\textsuperscript{14}

With the successful conclusion of JUGGLER, another struggle began over the much-sought-after B-24 groups. Once more Eisenhower asked for them and Devers opposed, cabling Generals Arnold and Marshall that if the groups were returned by 20 August they could accomplish the destruction of four to eight aircraft factories or aircraft engine plants in August of September. "Any delay now," he stated, "will jeopardize the success of the entire bomber offensive."\textsuperscript{15} Also, more B-24's were arriving in England from the United States and the presence of the experienced groups in the theater was essential because of the training and morale factors involved.\textsuperscript{16} After several exchanges of cables, the CCS evidently reached a decision by 19 August, for in a cable of that date General Eisenhower referred to their decision to return the B-24's to General Zaker.\textsuperscript{17}

But this was not the last of the competition for the three groups whose control must have been rapidly assuming the proportions of a major headache for all concerned. On 15 September, General Eisenhower returned
to the subject and again made a strong request for their services. This time the tactical situation was greatly in his favor. On the 9th, the Allies had made a very precarious landing at Salerno. The beach-head held, but a heavy German counterattack had been launched on the 11th and not till the 15th was there any assurance that the position could be maintained. However, the situation was still critical, and Eisenhower assured the War Department that if assigned to him, the Liberator groups would be used in daily missions to upset communications between the north and south enemy concentrations. Upon receiving Eisenhower's cable, the Joint Chiefs of Staff agreed to lend him the L-24's for a short period, provided British concurrence could be obtained. This was soon given and on the 16th, Devers was able to report that the 43d, 389th, and 44th were to be sent, making a total of 37 aircraft and 108 combat crews. Thus the Eighth again lost the use of practically all its experienced B-24 crews and their planes. However, it was evident that the arguments of General Devers, no doubt based on the advice of his airmen, had made an impression in the War Department for General Marshall made it clear that the groups were to be returned to England as soon as possible. On the 22d he cabled Eisenhower that the groups were sent to him as an emergency measure, and that the bomber offensive from England was thereby weakened at a critical time. Pointing out that there was considerable opposition, he concluded: "I hope that you will see your way clear to release them very soon." This request was promptly complied with; the planes were released on 24 September and shortly after returned to England. It is probably useless to argue the question of what these three groups would have done, if they had been able to remain in England.
during July, August, and September. However, it might be pointed out that during the first two months the theater strength was low, and it seems very likely that their absence had something to do with the decreased tonnage and claims for August. Important as was the POINTBLANK offensive, it had to compete with other high-ranking priorities, and it did not always succeed in holding its own. However, it is significant that after September 1943, the heavy-bomber forces in England were not raided again by other theaters. It is true that the medium bombers of the 3d Wing later became the nucleus for the IX Bomber Command which was organized in October, and in November some heavy groups in the United States were switched from the Eighth to the Fifteenth, but the B-17's and B-24's in the theater were henceforth able to turn their undivided attention to the bombing program planned for them.

Another serious problem affecting the success of operations was a shortage in replacement crews. The situation became critical in June. Following the mission of the 13th against Kiev, in which losses were heavy, General Iacker cabled General Arnold that "it is now perfectly obvious we are going to have a tough battle." He was gravely concerned over the flow of replacement crews and felt that the 75 promised in June and the 50 promised in July would not do. He was taking gunners, ground personnel, navigators, and bombardiers from the mediums to increase his crews and he urged Arnold to get crews from any source and rush him a minimum of 150 in June and 200 in July. In conclusion he summed up the crisis in trenchant phrases: "This battle against the German fighters is reaching its critical stage. We must press it at maximum. Any weakening or discouragement would be fatal. Repeat our greatest need
more replacement crews, next more depot facilities, third get long range
bombs for fighters. All must come through fast if we are to win this
air battle this summer."

In his reply, Arnold indicated some of the difficulties involved in
keeping up a sufficient flow of crews to the theater. One aspect of the
problem was to continue this movement of replacements from the United
States and at the same time to maintain and increase the regular theater
strength. To keep up replacements, it would be necessary to shift planes
from combat purposes to training, and that would hold down the number
that could be sent to the theater. Furthermore, if the planned flow of
replacements should be kept up, it would be impossible to turn out the
additional combat crews needed for the scheduled build-up of strength
in the United Kingdom between August 1943 and January 1944. "We are
accordingly facing," he cabled, "one of the most serious decisions that
we have had to make.""

Replying two days later, Jaker definitely favored keeping up re-
placements even at the expense of new units, if necessary. He believed
that 10 groups maintained at full strength could exert much more pressure
on the enemy than 20 groups at half strength with battle casualties not
promptly replaced:"

I know now that we must keep our combat units up to organizational
plane and combat crew strength if we are to win the American bomber
versus the German fighter battle now in progress. . . . Hence we
must get a higher flow of replacement crews even at a sacrifice of
some new units on schedule.

4The War Department was trying to furnish two one-half crews per plane
in all heavy and medium groups, and two crews for all other types of aircraft in combat organizations.
General Devers strongly concurred in these recommendations.

It is not clear from the available documents whether General Saker's suggestions were accepted at this time or not. Certainly, the replacement-crew crisis remained acute for the next two months. In July 159 crews were received, but 171 were expanded. In August 164 arrived and 120 were lost in operations, but in September there was a considerable improvement with 251 coming in and losses of 104.29 However, the heavy casualties in the early October operations made the situation critical again. On the 13th, just one day before the loss of 60 bombers and crews in the Schweinfurt mission, Saker was forced to cable that only 37 heavy crews had been received so far that month and that replacements for the month were far below predictions.30 Following the Schweinfurt mission, he again cabled Arnold that replacements and crews must be rushed at once; he expected to lose 200 that month31 and must receive a minimum of 250.32 In his reply General Arnold assured him that enough heavy bombers and crews were scheduled for delivery to insure his getting his minimum of 250.32 By the end of November incoming crews had brought the total (including casualties) for the United Kingdom up to 1,543 heavy-bomber and 1,187 fighter personnel.33

Although, according to General Saker, the shortage of combat crews was more of a factor in restricting operations than a shortage of planes,34 General Arnold was concerned over the large number of bombers which were reported as not ready for combat. It is perhaps significant that the previous week, General Spatz had written him expressing his regret that the full weight of American bomber production had not been thrown

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This was a fairly close guess, for actual losses came to 186.
against Germany proper. "I still believe that such an attack, if it had been followed through, may well have been decisive," Spiess had written. On 2 June, Arnold cabled G headquarters that "according to statistical reports too large percentage of our heavy bomber aircraft are reported not ready for combat . . . . I am much concerned over the limited number of aircraft reported ready for combat."36

In the reply signed by General Devers, it was pointed out that two factors were keeping planes out of combat. The first was the need of making additional modifications on aircraft after their arrival in the theater because of special local needs. The second factor was battle damage. The strength of the enemy opposition was greater in this theater than in any other, and the battle damage caused by the enemy's resistance was greater than had ever been contemplated.37 As yet, the repair organizations had not reached the necessary efficiency. For example, Devers cited a recent mission of 21 planes in which 27 had received some battle damage. Of the 541 heavy bombers allocated to units, only 335, or 62.5 percent, were ready for combat.38

This problem continued to disturb both the theater authorities and General Arnold throughout 1943. On 25 September he was again urging General Devers to keep only the minimum number of bombers in reserve or on the ground at bases,39 and similar reminders can be found throughout the October and November cables and letters. Of course, the modification and maintenance situation was only partly a cause of the slow build-up of combat forces. Another factor was the fact that apparently the bombers did not arrive from overseas in the amount which the planners anticipated. This was especially disturbing to the British.
On 15 August, the Air Chief of the Air Staff, Air Chief Marshal Sir Charles Portal, complained that the Eighth Air Force was considered below the build-up as organized in Directive 1 and approved at the Trident Conference. He urged that "the US Chiefs of Staff take all reasonable steps to increase striking power of the VIII Bomber Command during the next two months." He then added that "General Arnold visited the theater and was able to see the situation for himself. He asked General Marshall that it was necessary to send 20 B-17s to the theater at the earliest practical moment. Since 20 days were necessary to install the theater equipment, it would take till October at the earliest to get them all into combat. The heavy losses, battle damage and operational losses to the heavy bombers have cut down the number available to the organized groups so that they cannot even approximate a total of 35 planes per group ready for service."

Even more critical was the fighter situation. On 1 July, when the total fighter strength with units consisted of 216 P-47s, Maj. Gen. Simon Bolivar Buckner, Jr. sent a memo to General Arnold stating that the Eighth Air Force did not have enough fighter forces to conduct escort operations, and recommending that a 1:1 ratio of one fighter group per each two heavy bomber units would be established. Furthermore, he suggested that the 20th Fighter Group, a 33 P-47 organization destined for North Africa, but still in Britain, be sent to England and that three more 33 groups be with the twelfth also be transferred to the Eighth at the earliest opportunity. After more discussion, the question of the 20th Group was referred to the JCS who agreed to send it to England, but nothing was done about the other three groups mentioned by General Bolivar Buckner, Jr. and they remained in the theater until after the activation of the 20th Fighter Group.
Fifteenth Air Force.\textsuperscript{45}

In August the fighter situation was somewhat improved by additional shipments which brought the number on hand with units up to 278. In September the arrival of the first P-33's (all 13 of them) plus additional Thunderbolts brought the total up to 422.\textsuperscript{46} Since the twin-engine Lightning had a greater operational range than the Thunderbolt, General Arnold made special efforts to get P-33's into the Eighth Air Force as soon as possible. He finally decided to divert to Baker all long-range type P-33's and P-51's promised to the Mediterranean and Pacific areas for the last quarter of 1943. This should provide General Baker with 45 additional long-range P-33's in October, 92 in November, and 110 in December. It would also give him 31 Mustangs in November and 73 in December above previous expectations.\textsuperscript{47} Here again, the number sent to the theater remained considerably larger than the number that filtered through modification centers to become operational with combat units. The figures for the last four months of 1943 are as follows:\textsuperscript{48}

<table>
<thead>
<tr>
<th>Month</th>
<th>P-38</th>
<th>P-47</th>
<th>P-51</th>
<th>Total with units</th>
</tr>
</thead>
<tbody>
<tr>
<td>September</td>
<td>13</td>
<td>409</td>
<td>0</td>
<td>422</td>
</tr>
<tr>
<td>October</td>
<td>74</td>
<td>430</td>
<td>1</td>
<td>555</td>
</tr>
<tr>
<td>November</td>
<td>68</td>
<td>557</td>
<td>21</td>
<td>676</td>
</tr>
<tr>
<td>December</td>
<td>53</td>
<td>741</td>
<td>44</td>
<td>358</td>
</tr>
</tbody>
</table>

Nevertheless, by the end of the year the fighter strength had been greatly augmented and was no longer a pressing problem.

The desire to increase the number of American fighters in the theater was closely connected with the growing menace of German fighter attacks on the bomber squadrons. It had been believed at one time that the Fortress formations could fight their way through flak and enemy aircraft to the target and back without undue losses. The early missions in 1942 had
tended to substantiate this theory for losses were relatively light. However, by the spring of 1943 this comforting hypothesis was being shot to pieces. General Spaatz had foreseen that a time might come when the Germans would solve the problem of meeting the B-17, and warned that this would be a severe setback. Unfortunately, it began to look as though his warning was coming true.

The first signs of trouble were noticed early in January 1943 when the GAF began to concentrate on frontal attacks, since it appeared that the firepower of the B-17 was weakest from this direction. General Eaker was forced to admit that "the Germans are making frontal attacks almost exclusively and all our recent losses have resulted from this form of attack." However, he felt the front or chin turret would greatly reduce bomber casualties.

By April the Luftwaffe pilots had worked out new methods of assault that were hard to parry. In the broken raid of the 17th, which resulted in the loss of 16 bombers, these new maneuvers seemed especially effective. Instead of striking indiscriminately at the formations, the Messerschmitt and Focke-Wulf fighters concentrated on the lead group as soon as the open bomb bay doors indicated the bombing run was begun and that evasive action would be impossible. By this time the Germans had a good idea of the limits of traverse of the nose 50's, for pilots reported that the heaviest attacks came from 10 o'clock and 2 o'clock, just outside the cone of fire and from just below the lower traverse limit of the nose guns. Other techniques tried, which were going to become part of the standard equipment of the Luftwaffe, were diving nose attacks from higher levels in which the plane acquired great speed, mass attacks by
fighters in formation in line or abreast, and shelling of the formations with 40- or 50-mm. cannon by twin-engine fighters that paced the bombers just out of range. All of these methods proved to be effective, especially when the Germans learned to concentrate large masses of fighters at given points along the bomber routes.

By summer of 1943 the G.F had learned enough about the American heavy bombers and their tactics to put up a fierce defense when vital targets were threatened. The Eighth's attack on Kiel and Bremen, 13 June, produced an unusually heavy air battle. It had been assumed that the 1st Wing, which was attacking Bremen, would bear the brunt of the enemy attack and consequently it was made the stronger of the two. However, the formations were intercepted while still off the Danish coast and it was the 4th Wing which had to sustain violent assaults by some 200 enemy fighters. The 1st Wing's losses were relatively light, but the 4th lost 22 aircraft. This habit of concentrating on one formation while leaving the other almost unmolested was a popular technique with the G.F.

All types of attack and pursuit planes took part in the Kiel battle. The majority consisted of Me-109's and Me-110's, but Ju-88's, He-110's, and Me-210's were also sighted. Attacks came from all angles, but frontal assaults predominated; the fighters came in in pairs, in 3's, 5's, and 8's. Several attacks by six to eight planes abreast and in V's against the rear of the bomber formations were reported. Aerial bombing by enemy fighters was tried; the fighters dropped their bombs on the bombers and then attacked as soon as the bursts had dissipated, in the apparent hope of upsetting the formation flying. On the way home, while the bombers were just leaving the Dutch coast behind, there was another
violent attack which lasted until the planes were within 30 miles of the English coast; a particular effort was made, during this last phase of the battle, to pick off struggling Fortresses that could not keep up with the formations.55 Altogether, 71 per cent of the returning planes were rendered temporarily inoperative because of battle damage.

Ninety bombers were lost during June. While not a large number, perhaps, it represented 8 per cent of the attacking forces and this was considered serious.56 The percentage was only slightly lower in July, and at the beginning of August, General Arnold wrote General Eaker that he had asked the School of Applied Tactics to go into the matter very carefully and prepare a report on the best type of bombardment formation to be used over Germany. Furthermore, he had had I.J. Roach and other expert cameramen at AFST make photographs of various heavy-bomber formations employing nose and belly turrets, to determine the best defense against enemy attack, especially those coming from the front.57

Meanwhile, the air war went on. By now the GIs seldom rose in force to defend airfields or similar installations in France, Belgium, or Holland, but deep penetrations of the Reich always produced a fight. Such was the result of the GIs attack on Schweinfurt and Regensburg on 17 August. These targets were highly important to the production of German aircraft; therefore, they were defended "with determination, persistency and savageness seldom experienced by our crews before this mission."58 Several attacks were made by entire squadrons in line astern, and packs of Fw-190's and Me-109's came roaring down on the formations, spraying them with bullets on the approach and then passing through the groups to attack again. An interesting variation on the
usual German methods was the vertical attack by diving enemy fighters
to knock out the top turret; the attackers would then pass through the
formations and seek a position for another strike.\textsuperscript{59}

The German controller handled his fighters well on this mission.
It had been hoped that as the extent of British and American operations
spread over more and more of northwest Europe, the German defense net-
work would be badly strained. Unfortunately, such was not the case in
1943.\textsuperscript{60} The development of the air situation had evidently been fore-
seen and prepared for, and fighter pilots called out of their normal
zone showed complete familiarity with the new combat area. At the same
time, the controllers in France and Holland appeared to have a bird's-
eye view of the raiders' progress into Germany and knew well in advance
how to fit their units into the interception plans. In this case, the
defense staffeln based in Holland pursued the Regensburg formations down
the Rhine while their places were taken by other units transferred to
the Holland area from northwest Germany.\textsuperscript{61} As a result, when the Schwein-
furt raiders were returning to England, they were attacked over the Dutch
area by these relatively fresh replacements.\textsuperscript{62}

One new development was reported which was destined to provide one
of the severest tests of the Eighth Air Force. It can best be described
by quoting from the Tactical Mission Report of this operation:\textsuperscript{63}

Shortly after entering the enemy coast in, a pack of 7 F.1-190s
attacked the low squadron of our formation from the tail. They
approached firing steadily with 20 mm cannon and small calibre
tracer ammunition. When these A/C were about 750 yards from our
A/C a very large flash burst from the center of each E/A obliter-
ating it from view. These A/C then dived under our formation. A
second or two after the flash, several large black bursts appeared
amongst our formation about one and one-half times as large as the
ordinary flak burst. The projectile fired from these A/C and which
was accompanied by the flash, could be followed with the unaided eye
and appeared to be about 3 inches in diameter. This projectile burst in the air and not upon impact indicating a timed, rather than a percussion fuse. This attack crippled two of our 8/6, who were forced out of formation and were later brought down by a single attack.

Undoubtedly, this is a description of a rocket attack, which though not the first instance was certainly one of the best observed. Actually, the use of rockets against Fortress formations had been suspected as early as April, although British Air Ministry Intelligence did not take much stock in the early rumors of such a weapon. On 1 June, a report was submitted containing a brief description of the German rocket gun, and pointing out that equipped with such a weapon "one group of German planes could easily raise hell with a fortress formation if no countermeasures were taken."

After the Schweinfurt and Regensburg missions, there was little doubt that the G.I.F. had perfected a new aerial weapon whose development and use had already been foreseen by Alexander as Jerversky in his *Victory Through Air Power*. In a memo for the Commanding General of the Army Air Forces, Col. A. N. Brock, Jr., Assistant Chief of Air Staff, Intelligence, recommended that we should expend every effort to work out a defense up to 2,500 yards for our heavy-bomber formations, and General Giles advised General Zaker that the situation was being studied in Washington. As tentative solutions of the problem, he suggested that Zaker consider increasing his fighter support so as to provide successive waves of escorts; or perhaps employ specially trained bomber formation leaders with extra armor on the planes. In reply, Arnold cabled from the theater that the situation was serious. The rocket development of the G.I.F. had now reached a point where it was a hazard to our heavy operations, and there was evidence that planes had been hit by rockets,
causing great damage. These rockets were usually lobbed into the formations from distances of 100 to 1,700 yards. Fe urged that countermeasures be initiated at once to protect the bombers.67

Meanwhile, the Germans had perfected their tactics for the use of rocket-firing planes in combination with single-engine fighters, and as a result they were able to stage one of the most costly battles of the air war when the Eighth attacked Schweinfurt on 14 October. In the words of General Leiter, it was "the final countermeasure to our daylight bombing... a full scale dress rehearsal perfectly timed and executed."68 Concentrating on one bomber wave, a force of single-engine fighters attacked very close from the front, firing 20-mm. cannon and machine guns. As they broke away, they were followed by large numbers of twin-engine aircraft with rockets fastened under the wings. The rockets were lobbed in barrage quantities into the bomber formations with the firing beginning at long range. While this maneuver was being carried out, the fighters were refueling and taking the air again they at once attacked from all directions, while the twin-engine planes re-formed and prepared to deliver new rocket assaults. The Germans skillfully massed all their forces on one formation and after the rockets were expended, the fighters concentrated on eliminating the crippled bombers by gunfire. In this way, one combat wing was practically wiped out, losing 29 planes out of 49 attacking. The total losses were 60 bombers out of an effective force of 220.69

This operation with its heavy casualties caused something of a sensation. The War Department was especially concerned over the successful employment of rockets by the Germans. General Marshall cabled Leiter that he was "intensely interested in your message describing
the German rocket technique in their attack on your formations and I feel certain that you and your people will find quickly a means of reducing this hazard." General Arnold cabled that "we must be equally versatile in our technique and original in our ideas if we are going to continue these operations with any degree of success." He then inquired as to the countermeasures General Arnold proposed to take.

In reply, the General indicated a considerable change in the scope of his operations. He now intended to try multiple attacks by seven or eight combat wings of 54 bombers each on widely dispersed targets; this, he hoped, would force a thinning out of enemy defenses. He also said he wanted to use more fighter cover at lower ranges and urged Arnold to send him every available plane of this type. Greater emphasis was to be placed on counter-air force operations by attacking the fields with the medium bombers recently transferred to the Ninth Air Force, and by pressing the destruction of factories and repair establishments with the heavy bombers. Saber concluded by a request for more bombers and crews, more fighters, and more long-range fuel tanks.

By this time, it was clear that our hope of success in the air war was a narrow one at best, and it was clear to provide additional protection for the bomber formations had to be discovered. Certainly, the Eighth could not afford many missions which resulted in the loss of 60 planes and battle damage to 115. The Eighth had been skeptical of the whole idea of daylight attacks on one American general had already suggested that, pending the acquisition of bases on the continent itself, the Eighth should give up its own raids and confine itself to night attacks on the Ruhr. If the American bombardment doctrine was
to avoid... a plate revision, something would have to be done to counter certain fighter and rocket attacks on the isles, others.

... solution to this, problem has been sought for some time. One of the first ideas was proposed by General Spaatz. Writing General Spaatz on 27 April 1942, he suggested that auxiliary fire tanks seemed to offer the only immediate solution for extending the range of fighters unless it can be developed that the bomber, with its firepower, can substitute ammunition for its bomb and act as an accompanying fighter. 74

Neither or not General Spaatz's suggestion led to any action at that time is not clear. However, about the beginning of 1943 it was decided to reconvene a certain number of fortresses for escort work. Those planes, known as YS-40's, were to carry no bombs, but were to be provided with chin turrets to increase the forward firepower, and with additional well armament. Or, or was to be distributed literally; all essential on the well and fuel accessories were to be well covered with any prevent steel sheeting up to six-thousand thickness, and sections of the fuselage were protected. 75

From this experiment, and there was considerable pressure from the B-24's modelers' to get the YS-40's into service. The deliveries to the Ninth Air Force had been several times postponed, General Spaatz protested vigorously that he needed B-24's, and wanted them hurried up. 76 Eventually, the planes reached him as on 22 June 1943 a force of 11 B-24's accompanied 297 bombers on a mission to industrial targets near Antwerp. 77

Unfortunately, the scheme was not a success. After several operations, General Spaatz was repeatedly forced to write General Giles that "our tactical people insist that they do not want this aerodlane." 78
The objections seem to have been well put to its greatly increased weight of the ship. With its extra guns and armor, it became so heavy that it could not climb fast enough or fly fast enough to keep up with the regular B-17 formations. As a result, when the Y-40’s accompanied bombers, they upset the formations. Then it was decided to try them out as "in men," the two of them were assigned to fly protection for the leaders of each combat wing. Here again their quite different flying characteristics caused trouble and rendered them useless. By the 11th of October, it was decided to use them in flexible gunnery schools in the United States as they could not be used in the theater.

At least one good thing came from the Y-40 experiment. The value of the chin turret was shown as a means of strengthening the forward fire power and this later became standard equipment. Additional improvements on the Flying Fortress included oscillating sights for all turrets, reflector gun sights for flexible, hand-held guns, and better frontal armor. Likewise, the B-24 received additional forward guns and an improved turret for the tail position.

Another attempt to meet the GAF attack led to the development of blind-bombing techniques. Thus bombing could be carried out when the overcast made it difficult for the enemy fighters to assemble and at the same time bad weather over the target would no longer keep the bombing planes bound to their bases. The first successful blind-bombing techniques and equipment were developed by the British and used by the Eighth Air Force. By the latter part of July 1943, the War Department had approved a T/O for a pathfinder (blind-bombing) force and the first squadron was soon forming at Massachusetts Institute of Technology. At the same time, a prototype B-17 was being fitted up for this sort of
won at the Aircraft Radio Laboratory, Watfie Field, and early in September the first pathfinder units moved to England.\footnote{125}

By the end of September there were four planes equipped with a British device known as H2X and it was decided not to wait for additional equipment. These four planes were used to lead 330 bombers to Lübeck on 27 September. The combat wing led by the H2X planes was to bomb on the leader and the following units were to bomb on sky markers left by the pathfinder planes. Unfortunately, the clouds went up to 20,000 feet and the markers were not visible. Nevertheless, General Anderson commanding the VIII Bomber Command and his combat leaders considered the experiment encouraging.\footnote{123} As a result, General Eisenhower cabled General Arnold that every effort should be made to get an H2X squadron to England by 15 November, and to provide 30 per cent monthly replacements. He believed that overcast bombing might be the answer to the German fighter and was anxious to improve the technique.\footnote{124} By the end of October additional blind-bombing devices such as B8s were being used by the Eighth\footnote{125} and by the end of November pathfinder missions were a regular feature of operations.

But none of these developments really met the threat of the German fighter attack on the bomber formations. The real answer to the problem was to provide more Mustangs and Thunderbolts for the "big friends" on their deep penetrations. General Doolittle had stressed this point in a memo to the head of Army Air Forces on 22 May 1943. He pointed out that in the Northwest African Air Forces there was a serious shortage of long-range fighter escorts. If escort fighters could be used, losses

\footnote{122} was the American version of the British H2X.
would be reduced, the bombing would be improved, and the psychological effects would be so favorable that crews could be sent more frequently on missions. Furthermore, the new German methods of air-to-air bombing, heavy attacks by strongly armored fighters, and long-range machine-gun attacks could only be met by more fighters. "Although escort fighters have been desirable in the past," the general concluded prophetically, "they will be essential in the future." 36

Granted that long-range fighters were necessary, how was the range of the P-38, P-51, and the P-47 to be extended until they could provide fighter protection all the way out and back for the bombers? The answer had been given by General Spaatz when in 1942 he wrote: "auxiliary (expendable) tanks offer the only immediate solution for extending the range of fighters." 37

On 3 October 1942 the question was raised by the theater authorities as to the possibility of the United States furnishing jettisonable belly tanks for fighters. The first P-38's in the theater had possessed two 150-gallon tanks as standard equipment, but shortly after reaching England, the P-38's were transferred to North Africa. 38 Nothing was done about the tanks during the remainder of 1942, but early in 1943 the question was taken up again. The Air Technical Section of the VIII Fighter Command was investigating the possibility of having the tanks made in England, but it was first decided to obtain the equipment from the United States if possible, and on 18 February a request was sent out for 60,000. Owing to the immediate need for them, Washington decided to request the British Ministry of Aircraft Production to supply 16,000 jettisonable tanks of 200-gallon capacity for the P-47 aircraft.
The MAP instead countered with the suggestion that the tanks be made in the United States and shipped for assembly to England. This plan was rejected. Meanwhile, the Air Technical Service worked out a design for a steel tank which was approved by the Eighth Air Force on 27 May and the British were requested to manufacture it in quantity. Cynic to the current steel shortage in the British Isles the MAP offered instead to construct 108-gallon paper tanks of British design reinforced to withstand seven pounds per inch working pressure. This paper tank was approved by the VIII Fighter Command on 26 June and the initial delivery was made on 12 July. A short time later the first mission was flown with the paper tanks and was successful.

But the paper tanks were not the final solution, and since 4,000 metal tanks of 75-gallon capacity had recently arrived from the United States, it was decided to try equipping the P-47 (which had the shortest range of the three principal fighter types) with them, pending the availability of the larger paper tanks. It was believed that the Thunderbolt should be able to climb to 22,000 feet and travel 140 to 150 miles before having to drop the tank. The first flight tests of the P-47 with the metal tank were run off on 17 August and were successful. One week later the P-47's were sent on a combat mission with this equipment.

Meanwhile, the 108-gallon paper tank had reached production and on 3 September the British made their first delivery to the Eighth Air Force. However, as the steel situation in the United Kingdom eased somewhat, it was decided to manufacture steel tanks of 100 and 150 gallons. When the P-51 arrived in the theater it complicated the
situation since it had equipment for two 75-gallon external tanks, but because they were unpresurized and could not be used at altitudes of over 20,000 feet they were not desirable.\textsuperscript{95} It was finally decided to transfer the P-47 tanks to the P-51 as needed, and a temporary installation for the 108-gallon paper tank was worked out for the Thunderbolt.\textsuperscript{96}

Thus the difficulties were eliminated little by little. At the end of June there were enough fighters equipped with jettisonable fuel containers to go on a long-range escort mission. On the 27th, the day that saw the first pathfinder operation, the bombers that went to Bruch were escorted to the target and back by long-range P-47 fighters.\textsuperscript{97} By November enough planes were being equipped with the smaller tanks so that the radius of penetration and withdrawal support had greatly increased. By 14 December the shipments of British tanks were so large that production of the 75-gallon container was stopped in the United States, and at the end of the year there were between 2,000 and 3,000 jettisonable tanks at each VIII Fighter Command station.\textsuperscript{98} In 1944, the fighters would be able to accompany the bombers virtually to any target.

The long-range American fighter plane was the answer to the rocket and fighter combined attack on the heavy bombers. At the end of October, General Arnold could still write: "My concern about the fighter opposition that the Eighth Air Force bombers are meeting is very great."\textsuperscript{99} But after October the bomber losses never seriously threatened the build-up of strength in the United Kingdom. By May, only 2.7 per cent of the bombers reaching the target were destroyed.\textsuperscript{100}
In this victory, the adaptation of the single-engine fighter to long-range work played a large part. In the opinion of Wing Commander Nigel Tangye, it was "one of the most remarkable achievements of the war." For was the significance of this lost on the Germans. During his interrogation, P/O Hermann Goering, late of the Luftwaffe, stated that he could hardly believe it when told that American fighters had appeared over Hanover, and that he realized it was a tragic development for Germany.  

Thus, as the winter of 1943-44 approached, so of the problems of the Eighth Air Force seemed to have been solved. The increasing flow of planes and crews from the United States relieved fears that the offensive against Germany might fail for lack of strength and material. It seemed unlikely that XII.TAF would be threatened by diversions to other projects, and the appearance of the long-range fighter made it probable that by the first of the year the bomber squadrons would have complete fighter protection to the target and back.  

Nevertheless, General Arnold was not satisfied with the progress of POINTBLANK. The production of German fighters had been held down to approximately 400 Fw-109's and 200 Fw-190's per month for the last quarter of 1943, but the Luftwaffe was far from destroyed, and with the restriction of bombing operations which the winter weather would undoubtedly cause, it might be able to increase its production. On the day of the great Schweinfurt mission, Arnold communicated some of his dissatisfaction to Air Marshal Air Charles Portal. "OVERLORD hangs directly on the success of our combined aerial offensive," he began, "and I am sure that our failure to decisively cripple both the sources
of German air power and the GAF itself is causing you and me real concern.\textsuperscript{103} General Arnold then stated that he felt not enough planes were getting off the ground, and that he was "pressing" Eaker on this. He was likewise disturbed over deviations from the CBP priorities to such targets as shipbuilding installations, port cities, and the like, and he was also anxious to see more British fighters go into action.\textsuperscript{104} Two days later, he cabled Portal that the great effort being expended against the German aircraft industry by our heavy bombers would not show any early results unless the present front-line strength of the GAF could be severely crippled. \textquoteleft\textquoteleft We must bring into the battle against him all of our numerical superiority in aircraft. By this I mean specifically the aircraft of our tactical forces, your home defense forces, and the total weight of our combined bomber forces against the installations mutually selected for destruction.\textquoteright\textquoteright\textsuperscript{105}

In his reply on the 24th of October, Mr. Portal disagreed with certain parts of General Arnold's letter of the 14th while he agreed with others. He stated definitely that none of the official priorities had been altered in any way. The attacks to which Arnold had objected were dictated by reason of the training needs of crews, and because of the low number of crews and aircraft which did not permit of deep or frequent penetration into heavily defended areas.\textsuperscript{106} General Eaker had been asked to attack targets outside of Germany proper only when weather prevented operations against more important objectives.\textsuperscript{107} As to the failure to destroy the Luftwaffe, the main difficulty was to force the German to come up and fight. \textquoteleft\textquoteleft I fear that this is not always successful since his policy is to conserve his fighters and to use them only against
large bomber formations which penetrate deep into the heart of his country. 108

In the other hand, the air marshal admitted that in the CBO they had "fallen far short of what we hoped to accomplish." 109 For one thing, the AAF bombers had had to concentrate on Ruhr targets because of the short average nights. Also, it was difficult at night to locate the small towns in which any of the aircraft factories were located. The Eighth Air Force had been held back because of its slow build-up. It had by no means within 70 per cent of what had been anticipated for October, but its effective strength was only 50 per cent of what had been expected as available for Phase I of the CBO. Thus a great tactical advantage had been thrown away by the delay in the accumulation of strength, and the enemy had been able to handle this small force while he developed adequate countermeasures. Portal now believed that, unless it was decided to accept heavy casualties, it would take a greater force than that provided for in the CBO to achieve the anticipated effect. 110

It is evident that both Arnold and Portal felt a critical period lay ahead. Given an unusually bad winter with many nonoperational days and overcast targets, the AAF might succeed in recovering from the losses it sustained in the heavy attacks of July, August, and October. Such would depend on the conditions of the next four months. Few losses for the attack on the Ruhr and a few days of good flying weather in the winter might decide the success or the load invasion of the Continent in 1944.
Chapter IV

Chapter IV

...with the operative operations, a fundamental change took place in the conduct of the offensive against the Luftwaffe and German aircraft production: the Fifteenth Air Force ceased to be the sole exponent of 35 AL. The activation of the Fifth Air Force in the SO on 16 October and the Fifteenth Air Force on 1 November brought new forces into the air war, new bases from which hitherto unsighted targets might be attacked.

The Fifth developed out of a plan to extend the Ninth Air Support Command. In preparation for the World War II, it was planned to increase the fighters and fighter-bombers of the Ninth Air Support Command until it became virtually a tactical air force operating under the Fifth. However, when it was decided to return some of the tactical aircraft under the over-all supervision of Air ground Air Staff (USA) directly to the Fifth, the need was to create a new tactical air force for this purpose, although the organization would be under the operational control of the Eighth Air Support Command. A new commander was Lt. Gen. Lewis H. H. Wilson, for chief commander of the Fifth Air Force in the Middle East. In deference to his wishes, the new of his old command was transferred to his new post, and on 15 October the new Fifteenth Air Force came into being and organized two headquarters organizations on the old 35 AL, the 35th Air Force.
and the tactical air as of yet of the VAF air force service to date.

Until recently, this was under the control of the former US Air Force Joint Staff as detailed in the directive of 1 June 1917, which allows the medium bombers to take part in all US operations and gave first priority to the attack on the German fighter force and supporting installations. 2

The establishment of a new strategic air force in the Mediterranean theater was a much more complicated and involved matter. The main purpose of operations in this area had been to (1) destroy the Axis forces in North Africa, (2) aid in the invasion of the Mediterranean, and (3) secure bases in Italy for operations against the Axis. The air organizations involved in these operations were the 3rd, 5th, and 10th Air Force commands as well as the 1st, 2nd, and 5th Air Armies. 

The 3rd Air Force was composed of the 3rd Air Armies (3rd, 5th, and 6th armies), as well as the 1st Air Armies, which were under the command of the 3rd Air Armies. 

I have been very much concerned as to what will happen to the 1st Air Armies after the next operation or two. It seems very desirable that the heavy bomber effort against Germany be applied from here to the date area. We can establish ourselves in Italy, use of bases can be made, and there will be better weather conditions at our airfields that prevail generally in

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In Italy, this would immediately weaken her, force a dislocation of the German fighter and anti-aircraft defenses.

In his reply, General Marshall stated that his idea of a mater one priority mission was a new attack on her fighter establishments, and on 14 August he emphasized to Spaatz the effect of a sustained strategic bomber and on her key industrial areas from Mediterranean bases would justify giving this type of operation a newer the priority. 7

Support for a strategic bombing offensive from Italian bases also came from General Eisenhower. After the crisis at the Salerno beaches had subsided and it looked as if a fairly rapid advance might take place, he wrote General Marshall that he and General Spaatz believed a greater effectiveness might be achieved with less loss, if a portion of the bombing offensive could be applied from Italy during the winter months. 8 This would also make it possible to attack targets beyond reach of British-based bombers, there would be less risk for anti-aircraft or airfield generally, and the Luftwaffe would have to think itself out to meet attacks from two directions. Eisenhower concluded: "Since one of the major reasons for the move into Italy was to secure air bases for this type of operation, I feel that it is a matter which should receive early consideration."

On 20 August, General Marshall prepared a memo entitled "Command and Control of Strategic Air Forces Operating - Last Germany." Although primarily concerned with a question of command, this document did go into the desirability of establishing a new strategic air force in Italy.

*The date on the letter is not clearly typed; it is by 20 August.

SECRET

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Arnold felt that with suitable airfields in this peninsula, the carrying out of air actions against German industry would be facilitated by the alternative use of British and Italian bases, depending on the weather. Since he believed that the weather in the Po Valley would probably be better for bombing than that in England, it would be useful to have some airstrips in this area. Skuttle operations between England and Italy could also be carried out.

At this point, opposition to the plan developed. The British air authorities were strongly opposed to diverting heavy groups to Italy, and certain American generals in the Middle East were dubious about the idea. On 29 September, Air Marshal Sir Arthur Harris wrote General Eisenhower that he was seriously disturbed by the belief that bombers operating from Italy could do more damage to Germany than planes coming from English bases. He thought that many important production centers were closer to Britain and that weather conditions in the Lombard Plain were no better than England's. Furthermore, since the Italy-based planes would have to make a detour to preserve the neutrality of Switzerland, this would add to their journey besides simplifying the German fighter defense. In conclusion he stated:

It would take at least a year before a ponderable force of heavy bombers could be created economically from Northern Italy—after we have taken Northern Italy. For these reasons, I am convinced that the advantages to be gained from using bases in Italy are negligible. The loss of striking power against the vital parts of Germany, and of time, which would be incurred by transferring bombers to them from this country would, on the other hand, be quite disastrous.

General Eisenhower was opposed to the plan because he feared it would cut into his bomber and fighter forces and make difficult the accomplishment
of POLISHAIR. Maj. Gen. Ismail H. Edwards wondered if sufficient consideration had been given to the idea of a new air force in Italy. Like the British, he questioned the value and availability of Italian bases and felt that already existing facilities in the United Kingdom were adequate. He was afraid that shuttle operations would require more service personnel in both areas and if the Cradley Plan was not being met in the United Kingdom, how would this larger demand be satisfied? Air Marshal Bottomley warned that "we must avoid precipitate action which may result in sending aircraft and resources to the Mediterranean only to find them unable to contribute effectively from that theater."

At this point, the opposing arguments can be summarized briefly. General Arnold advocated the creation of a new strategic air force operating from Italian bases for the following reasons: (1) it would enable our bombers to reach objectives out of range of Britain-based planes, (2) it would divide German fighter strength, (3) it would make possible shuttle bombing between England and Italy, and (4) weather conditions in northern Italy would make possible winter operations against the Reich when British bases would be frequently nonoperational.

These arguments were apparently opposed by Harris, Portal, Bottomley, Tuker, and Edwards on the following grounds: (1) the most important German targets could already be reached from the United Kingdom, (2) Italian weather was quite as foul as the British variety, (3) to avoid Switzerland would greatly add to the length and danger of each mission, and (4) to set up a new strategic air force would seriously...
weaken the operations of the Eighth."

In view of the later operations of the Fifteenth Air Force, it is possible to make some sort of an estimate of these arguments. British claims that most of the important German targets were within reach of R.A.F and Eighth Air Force bombers seem to have failed to take into account the eastward dispersion of the aircraft industry. An Office of Strategic Services report of 17 August 1943 estimated that only 12 per cent of the German single-engine fighter assembly was carried out within 500 miles of London, while slightly over 50 per cent was located within about 400 miles of possible north Italian bases.16

Actually, in addition to the bombing of the great complex of Iien Neustadt, attacks on important Italian, Hungarian, and Yugoslav aircraft factories would have been impossible without the Fifteenth. Furthermore, the easterly dispersal of the GI plants completely knocked out the argument based on preserving the neutrality of Switzerland. The bomber routes lay far to the east of that nation. On the other hand there is no question but the English were right about the weather. Climatic conditions, according to Maj. Gen. Nathan F. Twining, commander after 3 January 1944, greatly hindered the Fifteenth's pursuit of FRIELN ED during January and February and they effectually prevented shuttle bombing and many combined operations.17 It is difficult to say how much the German fighters were split by the attack from Italy. Had it been possible to run more combined operations, there might be more evidence upon which to make a judgment, but as pointed out above, the weather usually interfered. It is also next to impossible to

*Perhaps the British and Americans in England were thinking of what happened to the Eighth's operations and supply system when the Twelfth was set up in the Mediterranean area.
estimate how much greater the Eighth's operations would have been without the establishment of the Fifteenth. Since the principal obstacle to carrying out the air offensive against the Luftwaffe was weather rather than lack of planes, perhaps the question is academic.

In spite of opposing arguments, General Arnold prepared a "Plan to Assure the Most Effective Exploitation of the Combined Bomber Offensive" and submitted it to the Joint Chiefs of Staff about 9 October. This provided for the establishment of a strategic air force in Italy to be formed by coining the six heavy groups of the XII Bomber Command with 13 groups to be diverted from allocations to the Eighth. The schedule a build-up was to bring the Fifteenth up to 21 heavy bombardment groups, 1 reconnaissance, and 7 long-range fighter groups by the end of March 1944. After being approved by JCS, it reached JCS and received their approval on 22 October, with the activation of the Fifteenth scheduled for the beginning of November. Even after this decision there was still some discussion. At the JCS meeting on 29 October, Sir John Dill voiced his doubts as to the wisdom of creating a new diversion from the bomber effort. As far as additional groups went, he was sure that the facilities in England were fully prepared to take them. General Arnold replied that General Spaatz would be able to accommodate men in Italy, and General Marshall said that he was concerned over the losses of the Eighth Air Force and felt it was essential to create a new air force or bomber force to help disperse the German fighters. Apparently this ended the discussion; on 1 November, the Fifteenth was formally activated under "Gen. James H. Doolittle with 233 bombers and 202 fighters on hand with units."
AIRCRAFT INDUSTRY TARGETS ATTACKED BY M.A.S.A.F.

REGENSBURG ME-109-A-C
AUGSBURG ME 410-C

SCHNECHAT HE219,HE210
STEYR ME-109-C
STEYR-L

FISCHAMEND ME-109-C
BAD VÖSLAU ME-109-A
WIENER NEUSTADT ME-109-A/C

GYOR ME-109-A/C
BUDAPEST ME-410-A
BUDAPEST ME-410-C

KLagenfurt ME-109-C
VARESE MA-202; MA-205
MILAN MA-202
VILLA PEROSA B
TURIN G-33
TURIN-B
REGGIO RE 2000

BELGRADE ME-109-C

LEGEND

X Hit but in partial operation
* Severely damaged but in non-operational at present
B Attacked by 8 Air Force also
A Assembly
B Ball bearing plant
C Components

SCALE 1:4,000,000
Immediately after the establishment of the new strategic force, the question of its control and certain policy was settled. In a directive of 23 October, the air force ordered the Air Force Commander, Generalissimo, to see to it that the operations of the Fifteenth were closely coordinated with the Fifteenth Air Force to improve the effectiveness of their operations against targets of the combined land offensive.  

At the same time, in case of a strategic or tactical emergency, he was authorized to use the Fifteenth for purposes "other than its primary mission," including the use of the aircraft and the use the Fifteenth was established, Generalissimo said it was clear that during the executive stage, no disinterest it be diverted from the land, and in addition that the units shadow technology was transferred to the Fifteenth Air Force.

The objectives of the new air force were four: (1) to destroy the German air force, (2) to participate in the land battles in Italy, (3) to continue to conduct operations, and (4) to weaken the German position in the Balkans. Operations against the aircraft and air installations were to be carried out in every profitable sector offered itself. Special attention was to be paid to Rommel's air forces in southern France and, just as the northern front, it had frequently been attacked.

In this respect, the new air force was established. Its objectives included the destruction of aircraft and air forces in Italy, as well as...
tentative priority list of targets was given as follows: 

1. II, Linz, Austria
2. Messerschmitt Factory, Regensburg
3. Willroß-Werke AGearing Factory, Aurrach
4. II, Austria, Aircraft Factory, Kjustarst
5. III, Austria, Messerschmitt Aircraft Factory, Linz
6. Heyen-Werke Aircraft Factory, Loos (Austria)
7. Messerschmitt Aircraft Factory, Linz

On 2 November, an important meeting was held atliner to coordinate aerial attacks. Remains forbad little at air and forced the victory. Understanding was reached as to the proper allocation of the Interdiction between the two strategic air forces, and procedures were set up to facilitate the many joint operations which were expected to take place involving the Eighth and Fifteenth. To ensure the rapid exchange of operational experiences and intelligence data, liaison officers were to be exchanged between the two headquarters. As a result of this meeting, a complete agreement was reached on procedures common to both strategic organizations.

Meanwhile, the Fifteenth had already become operational on 2 November by one of the worst raids of the war against the Messerschmitt Factory at Linz, Austria. It will be recalled that this complex had been attacked in August by the Eighth Air Force and considerable damage had been done. It was believed that the Germans planned to double the factory's output by 1944, but these plans had been delayed by the August attack.

By the end of October, some of the damage had been repaired and work was just starting on a large building in which was supposed to be building 'C-10' in its place and was shown to be an important unit in the expansion plans. Consequently, the raid of

2 November was well timed.
A great deal of careful preparation was involved in this mission. The distance which the bombers had to fly from their Sicilian bases was more than 1,000 miles round-trip, and 600 of it was over enemy-held territory. Since this made it possible for the GAF to take many interceptions, the fighter escort was to be extended to the maximum range which would give the bombers protection to within 100 miles of the target. Another group of fighters would then meet the formations at maximum range and escort them back to their bases.

Shortly after noon on the 2d, out of the operational aircraft of the Fifteenth took off and headed northward. Apparently intimidated by the attendant fighter groups, enemy interceptors based on the nearby fields at Skypol, Lecce, Careri, and Grosi did not take the air, and no serious fighter opposition appeared until about 10 minutes before the target was reached. A total of 112 Liberators and Fortresses dropped 327 tons of high explosive in spite of attacks by 150 to 175 enemy planes. The results were most gratifying. The aircraft assembly plant was destroyed and another damaged, two flight hangars were wired out, and many buildings showed blast damage. Craters spotted the Messer, Messerschmitt, and airfield and 13 aircraft were damaged on the ground. Buildings in the southwest corner of the plant and the adjoining labor camp were hit, and some of the machine shops in the Steyr-Daimler-Puch factory were struck. Eleven bombers were lost and claims of 56-27-3 were filed. It was believed that this raid deprived the Luftwaffe of a monthly output of approximately 250 of their best fighters, or 40 percent of the total output of the He-162.

While the Fifteenth was making this impressive debut, the Eighth was progressing rapidly in its development of blind-bombing techniques.
In the largest daylight operation yet carried out by American planes, a total of 1,233 bombers and fighters attacked German targets on 11 November using B2X leader planes, although F25 equipment was present in case the B2X failed.25 The results were satisfactory, and General Arnold instructed the Fifteenth to send certain officers to the United States to help organize a PFF unit for the new strategic air force. He contemplated sending eight B-32's equipped with B2X and crews in January and 16 more in February.36 Another big B2X mission took place on 13 November when 317 heavy bombers attacked Bremen, although covered by 7/10 cloud. Evidently the Germans had learned that the overcast was no longer adequate protection, for the mission was strongly contested and a fierce air battle took place over the clouds.37

On 8 November, the Fifteenth began a series of attacks against ball-bearing installations lasting three days. The Turin works were bombed on the first day, and on the 9th and 10th the Villar Ferosa plant slightly west of Turin was the target.38 The mission of the 8th was successful and the mission intelligence summary estimated that the factory would be completely inoperative for some time to come. The missions against Villar Ferosa were not so effective; the first attack missed the target entirely, and the second caused only slight damage.39

After five days of inactivity, the Fifteenth turned from ball bearings to airfields. The first target was, by request, the Athens/Eleusis airrome. This was the most active long-range bomber field in Greece. From 60 to 70 aircraft were usually based there including a large number of Ju-88's which had been operating against islands in the Dodecanese group held by the Allies. The island of Leros where...
the Germans had seized a beachhead was under especially heavy attack by enemy formations based at Eleusis. Consequently, it was hoped that a successful blow against it might ease the pressure at Leros.

The field was bombed by 46 B-24's with fragmentation bombs during the morning of the 15th with some success. However, a much more successful raid occurred on the 17th when 40 B-17's dropped 120 tons of 500-pound GI bombs with a heavy concentration on hangars, buildings, and the landing area west of the central runway. There were probable direct hits on five of the nine hangars and a direct hit on the central administration building. Of the 55 aircraft seen on the field, 10 were damaged and 5 were destroyed. On the 18th Athens/Eleusis was struck again by 50 B-17's dropping 6,900 fragmentation bombs to complete the destruction caused by the heavier explosives used the previous day. By this time the field was so thoroughly postholed as to be temporarily inoperative.

Meanwhile on the 16th, bombers of the Fifteenth Air Force carried out a raid on two airbases in southern France, thus fulfilling one of the requirements of their bombing directive. Istres le Tube and Salon de Provence were bombed by 85 and 43 B-26 bombers respectively with good results. On the 18th the Eighth made one of its longest flights to bomb the GAF airplane engine and fuselage repair depot at the Oslo/ Ljeller airbase, Norway. Due to the distance involved, no fighters could accompany the 102 B-24's which were dispatched. A total of 76 Liberators reached the target and bombed from the relatively low altitude of 12,000 feet to insure accuracy. The results were very good. The

*At this time there were two medium bomb groups in the Fifteenth Air Force.
C. L. Birninger Eisenwerke Airframe Repair Factory was severely damaged with hits on the dismantling shop, a storage depot, offices for production and blue prints, the heat treatment establishment, F. I-190 and 1e-109 component storage building, and other installations. The Daimler Benz Aero Engine Repair Factory had two main buildings almost completely demolished, and the Bayerische Motorenwerke Aero Engine Repair Factory was still burning when the photo reconnaissance was made. As the planes retired from the targets, fires were burning fiercely, there were heavy explosions, and a column of smoke arose that could be seen 25 miles away.

Operations of both air forces for the remainder of November were not especially outstanding. Weather constantly interfered; many missions had to be canceled and the results of those that were carried out were often unobserved. Some Wellingtons of the Fifteenth bombed the Turin ball-bearing works and the Ciampino airdrome in night raids with undisclosed results. Somewhat better luck was had when medium bombers attacked the Grosseto airdrome with 93.5 tons of 500-pound GP bombs. The Eighth concluded its November operations by two attacks on the town of Solingen in the Rhineland. This town was an aircraft parts and steel alloy center. In both missions the weather prevented an assessment of the damage. On the second mission on 1 December, the fighter escort stayed with the bombers until the IP was reached where upon the "little friends" withdrew. The formations were then attacked viciously by J.P fighters and 24 bombers were lost.

November was not an important month for R.U.T.E.J.I operations. The most important operation was the Fifteenth's attack on Liener Neustadt on the 24; for the most part, however, both strategic organizations
confined their efforts against the Luftwaffe to attacks on airfields and repair installations. Claims were considerably less than in previous months. The Eighth listed a total of 222 enemy aircraft destroyed, and the Fifteenth credited its aircraft with 135 kills. The Eighth lost 95 planes and the Fifteenth, 23. The newly organized Ninth Air Force confined itself almost entirely to bomber attacks on airfields in northwest France, Belgium, and the important Amsterdam/Schipol airport in Holland, while its fighters often escorted the heavy bombers of the Eighth over the Continent.

In December, the weather continued to restrict the operations of the Fifteenth Air Force, and the POL-TANK program suffered especially. Airfields were the principal target, with several attacks being made against G.I.F. bases near Athens. The Fiat Ball Bearing Works at Turin which had been twice raided in November was visited again by 113 B-17's for the first mission of the month on 1 December. Coverage of the target by some 354 tons of bombs was regarded as complete by the returning bombers and later reconnaissance reported considerable damage to the factory. Prior to these attacks, the Fiat plant was supposed to produce 40 per cent of all the ball bearings available to Germany; it was now believed that two months' output had been eliminated.

The Rome/Jasale airfield was attacked without opposition on 3 December by a small force of Liberators dropping 32.24 tons of fragmentation and 16 tons of GP bombs. On the 6th, a series of raids on the Athenian airfields was begun by attacks on the field installations at Athens, Eleusis and Athens/Kalamaki. The attack on Eleusis was made by 45 B-17's escorted by 33 P-38's. Fragmentation bombs were dropped with fair success,
but the photo coverage was not good and an exact estimate seems to be lacking.\textsuperscript{58} The Hikarigi airdrome was first bombed by 500-pound GP bombs and then hit by 4,250 fragmentation bombs. Dust and debris made it difficult to assess the damage done. In both cases, these attacks provoked a certain GP reaction, but the air battles were usually small affairs and not very costly to either side.\textsuperscript{59}

Another attack was made on the Creek Fields on the 8th. Eleusis was raided again and well covered with 3,172 fragmentation bombs. The Athens/Tatoi field revealed a concentration of 22 aircraft, and so it was hit by 30 Liberators dropping 4,000 of the 20-pound antiaircraft and antipersonnel bombs. It was estimated that 14 aircraft were destroyed on the ground, including seven bomber-transport types.\textsuperscript{60}

Later reconnaissance confirmed this, and credited the attacking forces with wiping out 21 aircraft at the Eleusis airdrome.\textsuperscript{61} Again on the 14th the three Athenian fields were attacked by Liberators and Fortresses of the Fifteenth, with P-38 and P-47 escorts. Tatoi was well covered and seven hangars received direct hits or near misses; the runway and west dispersal area were a mass of smoke and debris as the bombers retired from the area.\textsuperscript{62} Hikarigi was hit by the largest task force (76 bombers) of the three, dropping 224.5 tons of 500-pound GP explosives. Between 15 and 20 F.-190's and F-109's were encountered over the target and 3 were claimed as destroyed. During the attack, 23 enemy planes were counted on the airfield of which 8 were destroyed and 7 believed damaged. There were heavy concentrations of hits on the hangar area, storage facilities, landing strips and runways, and dispersal areas.\textsuperscript{63}

The final blow was struck on the 28th when Eleusis was heavily bomb
by a task force of 109 B-17's escorted by 66 F-39's. The defense was
the stiffest yet encountered over the Greek airfields. Both flak and
planes were well controlled, and the tactics had obviously been planned
in advance by experienced personnel. The bombing was considered
successful; many buildings were struck and the field was well holed.
Three bombers were lost.

The only attempt made to bomb a high-priority WHITEHALL target
occurred on 17 December when a small force attempted to bomb the Messer-
schmitt factory at Lusburg in southern Germany. Unfortunately, the
strike photos contained nothing but an excellent view of the cloud cover
over the target, and visual estimates indicated that the bombs fell south
of the objective. Five Liberators were lost.

A final blow was struck at airfields when medium bombers of the
Fifteenth (the 17th and 319th Groups) attacked Cuidonia and Centocelle
on 23 December. Strike photos showed 12 aircraft on the ground at
Cuidonia with 7 destroyed and 1 damaged. The bomb pattern covered the
field. At Centocelle, bomb strikes were distributed over the southeast
side of the field only.

WHITEHALL targets within range of the Eighth Air Force did not
come in for much bombing during December. Weather conditions often made
deep penetrations of the Continent impossible and consequently ports and
shipbuilding establishments received more than usual attention. Many
attacks were made on Leiden and since this city was well defended by
fighter planes, a big air battle resulted each time the heavy bombers
came over. The attack of 11 December produced an unusually fierce re-
action with very large forces involved. A total of 1,023 American
planes—532 heavy bombers and 560 fighters—attacked the city. The German fighter controller apparently correctly diagnosed the objective of the mission shortly after the bombers left the English coast, and as a result the German fighters committed themselves early in the raid.

Several fighter groups were jumped on their way to the bomber rendezvous while they were still flying on belly cans. According to one account, "The new single-engined Me 209 was encountered this raid and it outturned, out-climbed and out-ran our T-47 at 27,000 feet altitude." The 3d Bomb Division, which did not have close fighter support, bore the brunt of the German attacks and suffered the heaviest losses. The Me-109's and 120's attacked the lead groups in formations of three to four abreast from 10–12 o'clock. All carried rockets which were released simultaneously at 400-yard range. Then the enemy opened up with cannon and machine guns. They came in close to 200 yards and then dived against the low groups. These attacks were effective and are believed to have accounted for most of the total losses of 17 bombers. Claims were 80–92–23.

The only strictly bombing operation carried out by the VIII Air Force, Jordan during November took place on the 31st. The targets were Paris plants producing ball bearings for the German war machine and Luftwaffe depots and fields in southeastern France. Ten of the wings of the VIII Air Force, Jordan were involved, totaling 104 effective sorties. Claims were 24–22–22 and losses were 25 bombers. Approximately 350 tons were dropped on ball-bearing plants at Ivry and Bois-Colombes and also the Limoges-Douze auto-engine works in the latter town. The photos show wide-spread damage at all the targets. The airfields at Tours, St. Jean d'Angely, and Le Mans de Sougy were bombed by 257, 69,
and 19 aircraft respectively.72 Good results were obtained at all three places, with heaviest damage being done at Naples where an oil storage tank was hit.73

Although the weather interfered with operations to a considerable extent in December, the combined strength of both the Eighth Air Force operations were practically nil, except for the raids on Crete and Italian airfields by the US carrier task Force, of the total 10,000 tons dropped by the strategic air forces, 6,400 tons of 1,050 tons dropped by both strategic air forces, 5,100 tons fell on Italian targets.74 Nevertheless, Eighth Air Force operations were practically nil, except for the raids on Crete and Italian airfields by the US carrier task Force, of the total 10,000 tons dropped by both strategic air forces, 6,400 tons fell on Italian targets.75 and the 1-2 of the Fifteenth Air Force warned that if the offensive against the German fighter industry were not followed up with further attacks, production would remain at the July level by February 1944.76

There is no doubt that General Marsh was seriously concerned. On 26th March, Air Marshal Harris-tollory visited him in London, he had been very critical of his efforts for greater action against Germany, in March until our real numerical superiority,77 although more current orders were issued and some raids were being

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not contribute to the destruction of the German Army, and his failure to see the growing records of the Eighth and Fifteenth
he stated: 73

It is clear that at that time, the Eighth and Fifteenth Air Forces were under the control of Allied command, and if
the Eighth and Fifteenth Air Forces were under Allied control, it would be impossible for the German Army to
be destroyed.

It seems likely that the slow progress of the Eighth Air Force also affected the decision on the rapid buildup of
American and British strength that had been concerning the American and British staffs. For one thing, the situation
of the Eighth Air Force in Italy was still confused, several plans were put forward to the American authorities to establish a sort of over-all control
for the various air organizations operating in the area. 10 The British seemed to be convinced that it was impossible to
convince the British of the practicability of setting up a separate air command for all American air forces in the
European theater. General Arnold argued that some control would be greatly facilitated
if the Eighth and Fifteenth Air Forces were under Allied control. 11 This
question was discussed throughout the war and was met with considerable
opposition to the proposal coming from the British, and from General
Dwight Eisenhower. 12 Early in September, the U.S. Chiefs of Staff rejected the
British objections and indicated their intention of setting up a
unified strategic control for all air forces in the European theater. 13
In their memo to Combined Chiefs of Staff, the U.S. Joint Chiefs of
Staff stated that "these forces should be employed primarily against
U-boat objectives as the Combined Chiefs of Staff have decided.
It seems reasonable to assume that General Arnold's
dissatisfaction with the progress of the offensive against the German
and one of the factors which led him to favor this new arrangement.
Meanwhile, it had already been decided to reorganize the air command in the Mediterranean, and on 10 November 1942, the Mediterranean Allied Air Forces (M.A.F.) was officially authorized. This command, under Air Marshal Sir Arthur W. Tedder with Air Chief Marshal Sir Arthur Harris as deputy, consisted of the Fifteenth and McLainth Air Forces, the Coastal Air Force (U.S., British, and French units), and the M.A.F. Middle East Air Force, totaling approximately some 12,500 aircraft and 321,000 men (January 1944).  

However, almost immediately after the formation of M.A.F its command was changed. General Spaatz and Marshal Tedder were brought to England and General Eaker was moved from the Eighth to command M.A.F with Air Marshal Sir John Elessor as his deputy. These final changes were not completed until the middle of January.

The Cairo Conference which sanctioned the creation of M.A.F also gave formal approval to the centralized control of strategic operations in Europe, so long desired by General Arnold. The official directive activating the U.S. Strategic Air Forces in Europe (U.S.A.F., later U.S.A.F.) was issued 5 January 1944. U.S.A.F. was to come under the Supreme Allied Commander (S.A.C.) at a future date; in the meantime, all Allied Air Forces operations would be coordinated by Air Marshal Portal, acting as agent of the S.A.C for both British and American air forces. Under his direction, General Spaatz, commander of U.S.A.F., would direct strategic activities of the Eighth and Fifteenth Air Forces, coordinating the latter's activities as far as possible with the operations of the Allied Commander in Chief in the Mediterranean, Sir Harry H. K. Wilson. In case of a strategic or tactical emergency, General Wilson was empowered
to use the Fifteenth Air Force as he saw fit, but for the rest, he was required to provide it full support in I.N.E.F.L.I.E. missions, its first priority. It was soon arranged that General Spaatz would deal with the Fifteenth only through I.N.F., and that General R. E. would have operational control of this force subject to 22nd directives.

Issuing these directives was the responsibility of Air Marshal Portal. Joint Anglo-American committees prepared studies of the various targets and presented evaluations of missions. Their recommendations finally went to the Joint Target Committee which prepared the directives for Portal's signature. The directives were received by UL.T.E.F. and then reprocessed to the Eighth and Fifteenth. General Spaatz and his deputy commander for operations, Maj. Gen. F. L. Anderson, controlled the order of selection of targets.

In some ways, the problems and duties facing the new commanding general of I.N.E.F. were much more involved than the situation in the United Kingdom had been, and it did not take General Eaker long to discover this. He wrote in March:

This is a new battle of skill from U.L.E.F. The job there was clean cut. We had really but one major program: to deliver the maximum bombload against German industry. Here we have three primary tasks and many, many subsidiary ones. The primary tasks are: the accomplishment of I.N.E.F.L.I.E. with the Strategic Air Force; the support of land armies in battle with the Tactical Air Force; and keeping the sea lanes open and protecting the logistic establishments with the Coastal Command. In addition, we have such odorous chores, or secondary commitments, as reequipping the French, maximum lift to the Balkan partisans, moving out of Africa and leaving the African war behind and moving into Italy and setting on with the continental war.

Furthermore, the demands of the land battle in Italy frequently cut into the strategic bombing operations. Thus when General Eaker arrived at UL.T.E.F. Headquarters, he found the Fifteenth involved in an extensive attack on airbases in preparation for the Anzio landings on 22 January, and
this continued into February. Indeed, a great deal could be written during this period about the constant bug-war that went on between the often conflicting demands on AMF's vast reservoir of air power. There were conflicts between different projects: "FIRST vs. STALI vs. N/A; also between tacticians as to whether the ground campaigns or KU1 vs. KU2 should have first call on the heavy bombers; and between the airmen as to which types of target were the best for the bombardment effort.\(^95\)

In spite of policy disagreements, the air war continued as intensively as the weather permitted. On 3 January, the Fifteenth raided the Fiat ball-bearing establishment at VillarPerosa. With the successful raids on other centers of ball-bearing production such as Sornemfert (14 October 1943) and Turin (8 November), the Fiat plant had assumed an especial importance. It was reported that 40 tons of ball bearings had been shipped from Italy to Germany in November; before this date, there were no comparable shipments. Furthermore, the plant at VillarPerosa was supposed to be making a special type of bearing essential to aircraft production.\(^96\) Consequently, a small force of 50 B-17's attacked this target on the 3d, dropping 150 tons of 1,000-pound bombs from an altitude of 23,000 feet. The strike photos showed 12 direct hits on the main units of the plant and damaging near misses. Later reconnaissance photos showed that the factory had sustained extensive damage with 25 per cent of the roofing destroyed.\(^97\)

The next missions for both the Eighth and Ninth were minor. As part of a larger mission to Iiel, Eighth Air Force bombers struck at the airfields at Bordeaux and Tours on the 4th,\(^98\) while the Fifteenth
dispatched 43 heavy bombers to bomb the Steyr aero-engine factory at Maribor, Yugoslavia, on 7 January.99 No strike photos were obtained and the results were not evaluated until the end of the month.

On the 8th, the fifteenth bombed the Reggiane Aircraft Factory at Reggio-Emilia. This mission was preceded by a careful reconnaissance which indicated a considerable turnover of single-engine aircraft. Between 3 and 7 January, the number of aircraft on the adjoining airfield varied from day to day as follows: 17, 23, 40, 18, and 35. It seemed likely that the Germans had converted this factory and airfield into an important depot for fighter repair, maintenance, and supply.100 The target was first attacked during the night of 7-8 January by 26 Wellingtons dropping 39.5 tons from 2,000 to 8,500 feet. The town, factory, and airfields were covered with bursts, and at least two 4,000-pound bombs hit the factory. Many fires were started.101 The following day, 109 B-17's escorted by 32 F-33's dropped 324 tons on the still smouldering buildings. All opposition seemed crushed as there were no aircraft over the town and no flak. With at least 20 direct hits on the factory buildings, this target was eliminated for the time being.102

The Eighth did not send out another FEINT mission until 11 January when, unfortunately, weather seriously interfered. It had been planned to make an attack in force on the Ki-190 assembly and component plant at Oschersleben, the Ju-88 wing manufacturing works at Halberstadt, and the Lohrenbau u. Industrie A. G. aircraft assembly plant in and about the city of Brunswick. Over 700 bombers assembled, but unforeseen cloud formations made the mission confused and ultimately costly.103

Three bombardment divisions totaling 12 combat wings were dispatched.
The 1st Division consisted of 5 2-17 wings; 3 wings containing 175 bombers were to attack Oschersleben, and 2 containing 114 planes were sent to Halberstadt. The 3d Division made up the second formation and had two objectives: 3 wings of 172 aircraft were to bomb the IG plant at Augsburg, and 1 wing of 62 Fortresses was to bomb IG in the Wilhelmitor suburb of Brunswick. The 2d Division which was flying last was to hit the IG plants at Tempskrotor and Wilhelmitor with 85 and 55 aircraft respectively. A total of 663 planes was dispatched.

The 1st Division took off as planned but had difficulty in contacting its full quota of escort fighters, and over the last 100 miles it was attended by only one Mustang group which had to divide itself in two parts when the division approached its twin targets. After the 3d Division took off the weather began to deteriorate rapidly and the formation finally received a signal ordering it to return. However, the 1st Combat wing was near its objective and it elected to continue on to the target; the other wings declined to return and bomb targets of opportunity on the way out, thus causing considerable confusion to the covering fighters. The last formation was over the Dutch coast when the recall signal was received and it turned back, bombarding the towns of Venzen and Lingen on its return to England.

In spite of these difficulties, the formations that reached their targets did good work. There was some confusion among the formations of the 1st Division as the target came into view, but a good pattern was dropped on the IG-10 plant at Oschersleben. Damage was severe in the main plant area with fires burning in the machine and assembly shops. At Halberstadt, the main concentration fell just east of the...
plant area, but a second wave scored heavily on a large workshop, and smaller buildings nearby. Good bombing was done on the H.G factories in the Brunswick area. 105

Apparently, the German fighter controller first diagnosed the attacks as directed against Berlin, for virtually every German fighter within range was called into the battle, even including one enemy-flown 1-36. 106 Owing to weather and the recall of some of the wings, fighter protection for the bombers was not as successful as in previous missions. As a result, some 500 German fighters were able to inflict considerable damage on the task force. The heaviest assaults came on the lead groups in the 1st Division which had its low squadron entirely destroyed and lost a total of 30 planes. The combat wings of the 3rd Division which penetrated to the primary target lost 12 bombers, and two more were lost by the 2d during its withdrawal. Together, 60 heavy bombers failed to return. 107

The middle of the month brought a new operational directive for the Fifteenth Army General Staff. The ranking objective was the destruction of the German fighter force, to be accomplished in the following schedule of priority: 108

1. G.F single-engine fighters
2. G.F twin-engine fighters
3. The ball-bearing industry

Chief targets in the first priority were the Messerschmitt factory at Regensburg (first), the Fischgerodt Markt (second), Werke I and II (third) at the great Messerschmitt complex in Ichenhustadt, and the extension of the complex at Ilmenfurt (fourth). Also listed as secondary targets in the first priority were the factories at Bad Fischau, Györ (Hungary), Nefudrfl, Regensburg/Erzgebirge, and Lauen. 109 Only
two objectives were listed as twin-engine factories; these were the Messerschmitt plant at Augsburg, and the Dora-Tepulco steel factory at Saarbrueck, Posen. For ball-bearing attacks, the directive listed the Fischb plant at Schweinfurt, the VFW at Stuttgart/Bad Cannstatt, the Steyr-Lindler-Luch works at Steyr, Austria, and the G. Muller factory at Munich. However, this list remained more of a sign of things to come rather than something immediately effective. The weather, of course, frequently interfered with the long flights into central Europe, which were necessary, to reach any of these high-priority objectives. However, in addition to weather, the Fifteenth was unable to devote its full attention to aircraft factories because it was involved in support of the amphibious operations of the ground forces in the Pas de Calais (Operation S. E. A.) which began with the landings at Arromanches. Both before and during this operation, more than 5,000 tons of bombs were dropped by the strategic force on airfields and communications. Of special importance were the attacks on 11 major airfields, which rendered the enemy air reconnaissance completely ineffective and allowed the Allies to achieve a rare thing in modern warfare—a complete surprise.

The 13th of January was a big day in counter-air force operations, as a part of the preliminaries to the major landings, three airfields at Arromanches, Antoia, and Soubise were attacked. The Fischb airfield, which was a big reconnaissance center, was attacked on the night of 12-13 January by 49 ill-fated with uncertain results. The following morning, the US 8th in striking 40 B-17's dropped 43,9 tons
of fragmentation bombs. A cloud over the target prevented an estimate of the bombing. Captosello, located on the front of Rome, was an important fighter base for CBD operations in support of the forces defending central Italy. It was held by the German forces which did so only to service the administrative units. Guidonia, a little to the north, was also attacked by CB-17's of which only 3 were able to fly, one remainder bringing their explosives back to base. There were direct hits on four hangars, a workshop, in case B-24's, and a transfer station. The next day, perhaps to divert the Luftwaffe's attention from central Italy, the fighter airfield, near the Italian coast, was raided by 110 CB-17's dropping 200 fragmentation and 213 tons of bombs. Two-thirds of the field was well protected and only installations hit.

Since two later orders from the Fifteenth Air Force directive to strike at the landing grounds at Campi, in the airfield in central Italy, perhaps to hit the southern part. The results were satisfactory. In the 17th, small forces raided the fields at Campi, and, in Captosello, with 300 of 111's dropped 220,750 tons of the enemy in the first week of the year. Two 17-inch fields were hit with 12 tons of bombs. In four subsequent attacks the area was covered. The raiders were over the entire Italian island. The remainder at Campi saw little action while simplifying and organizing in the area. The 17s hit the island airfields with 380 tons of bombs. In the 17th, the attack was switched to southern France, and thereafter in June an order to reserve airfields were successfully to led by all forces of CB-17's.
was seen a short time earlier from the air, 120 and on the 1st, 29-31
with, it collected at a point to the west of the city on 31st they
river from another sector. 121

In the meantime, the Allies continued to increase the
situation was similar. With the Allied troop movement in 
their reach, the German forces located in southern France
to conduct large-scale attacks on the shipping in Naples harbor,
and against the Axis positions on the 23rd and 24th of January, 122
which was called the "Weser", reached vessels on the 27th.
the main group and the major forces were again returned to
the front of the Allied forces. Included in this was the 7th Air
It seemed likely that these would continue their attacks on Axis
installations in southern France and the Balkans. However, to begin with
the area, a series of English drops was launched for a four-day
period. While against the Front and Italy, but others in northern
Italy, which wereਸtakcs on the front even the forms were
attacking in central Italy.

With the 7th Air, the area of operations, from the
area, the Allied reserves were in the nearby area near
and, there was another blow the larger areas, between 25 and 30
1-10s until 13:30 to the Air and the German advance,
planned, was not clear, the area of operations, the target was still
covered by the 92rd or offensive areas. 123 It was not clear if
were not present. Note: ships and vessels in the target area with 20
nits on the main area the considerable protection along installations. 124

SECURITY INFORMATION
This last detailed, the Fifteenth was next called upon to deal with a situation at the Vibo airfield. Reconnaissances of 29 January had revealed an increase in the number of crews, more at this base from 54 to 70, of which 15 were now Ju-88's. It seemed possible that the Germans
were withdrawing the bombers from the Greece-Brindisi area for operations from the Vibo airfield. No. 201 Squadron, led by Flt. Lt. J.B. Lace, the French airmen, 64 -17's visited this target and covered it with over 9,000 lb. of incendiaries. Alack, although French fighters took the air against the bomber squadron, there were no losses. Many of the buildings on the field were hit, but the main landing area was well covered with bursts. Of the 50 enemy planes sighted on the field, 6 were damaged and 1 reported destroyed. 122

The climax of this series of tactical operations in support of the main beachhead was the great counter-air force action of 30 January. The main landing was, in a sense, the prelude to this operation, for it was an attempt to break up a concentration of German low-range bombers. Following this raid, there was a wide-spread reconnaissance of German bases in northern Italy on the 27th. This showed a total of 170 enemy aircrafts in the area, with 121 distributed on the four fields of Vibo, L'Amiata, Villaorba, and Udine. 127 It seemed likely that the Germans were trying to counteract the threat of German bombers based in southern Italy by developing considerable air strength in the north, especially low-range bombers. Villaorba,
for example, was showing a considerable increase in 1943. Such bases could be used for raids against shipping and airfields in the southern area, and therefore a large operation was planned to render them useless. It was decided to bomb the four fields, but to take care of the concentration of planes at Villacorba, this field was to be the object of a special mission planned with great skill. Since the Germans usually put all their aircraft into the air as soon as the radar informed them of the approach of heavy-bomber formations, it was decided to send a group of 1-17's in, below the radar screen if possible and a few minutes in advance of the heavy formations to catch the German planes still on the ground.

The surprise worked perfectly. About 1130 on the morning of the 25th, an approaching force of heavy bombers showed strongly on the radar screen of the Villacorba field and the pilots began warming their motors for a quick take-off. A few had just left the ground when suddenly at 1140 a force of 60 Thunderbolt fighters swept in at terrific speed just above the treetops. The Germans were caught completely off balance, and for the next few minutes the Thunderbolts had a field day. Altogether 25 enemy planes were shot down for a loss of two. Hardly had the dust settled before 70 1-17's came rolling over at 23,000 feet to drop 10,965 francs and complete the job.

While this brilliant tour de force was being carried out at Villacorba, the three other fields were also being dealt with in summary fashion. Muniaga was bombed at 1157 by 35 1-17's, and a heavy concentration was achieved on the northern landing area. There were several fires started, and bombs were seen exploding among the parked
aircraft. Lavernia was attacked at the same time by 41 heavy bombers flying in two waves. The second formation was attacked by 25 to 30 German fighters during the bomb run, but only 1 bomber was lost and the field was well covered with hits. Shortly after these three missions, 63 Liberators reached the Udine airfield and dropped a heavy load of fragmentation bombs. The north landing ground and hangar area were hit repeatedly, and so were the 40 aircraft parked on the field. About 35 He-109’s and Fw-190’s pressed home attacks just after the bomb run was made. The bombers claimed the destruction of 14 fighters at a loss of two Liberators.

The raids of 30 January undoubtedly dealt the enemy a severe blow. In addition to losing valuable planes, the large number of damaged aircraft probably strained its repair and maintenance facilities to the uttermost. The destruction of those facilities at Udine and Livenza made the situation even more critical. The nearest repair center now available was at Klagenfurt in Austria, very near the Italian border and considered a key point in the defense of south Germany. To complete the work of the 30th, the airfields at Livenza, Udine, and Klagenfurt were attacked on the 31st by 41, 70, and 71 heavy bombers respectively, with successful results. At the last field 67 aircraft were seen on the ground, and 11 were destroyed and 7 damaged. In estimate of the enemy air situation given in the Intopie Summary for 31 January stated the following:

Experience in previous campaigns indicates that estimates of ground damage based on photographic evidence are conservative. In the present case, air claims appear reasonable on analysis of the apparently serviceable aircraft remaining after the attacks. Concrete evidence shows at least 145 enemy aircraft destroyed or damaged and it is highly probable that substantially more were rendered unserviceable by the operation.
Eighth Air Force operations during this same period were against other than ULTRA targets. Weather in many cases prevented the deep penetrations necessary to reach centers of G.F. production, and blind-bombing equipment worked more successfully against harbors and port installations than against the small towns where some of the factories were located. The only major mission of the month against an aircraft factory turned out to be unsuccessful. Out of an available strength of 916 bombers 777 were dispatched on the 30th to attack the factories in the Brunswick area. Unfortunately weather conditions proved very bad with 10/10 cloud over the entire Continent with tops reaching up as high as 27,000 feet. The 14th Combat Wing lost contact with the other formations and bombed Hanover instead of the primary. No estimates of the bombing could be given because all formations bombed by R.A.F. equipment. The German fighter opposition was strong, with approximately 300 fighters involved. Rockets were used successfully. In spite of escort fighters numbering 935, 23 bombers were lost, and 4 fighters. The fighters claimed 45-15-34.136

A new phase of air warfare was introduced on the 31st when 75 fighter-bombers of the VIII Fighter Command were dispatched with an escort to dive-bomb the Elbe-Rijen airborne. A total of 17.5 tons were so dropped and as the weather was generally clear in the area, the results were good. Approximately 120 enemy aircraft opposed the operation and some vicious combats took place. Six escorting fighters were shot down and in return the Eighth's fighters claimed enemy losses of 13-0-1.137

On the whole, January like December was not an important month for
MEALL operations. The Fifteenth was handicapped by bad weather and its obligations to support the ground battle. Nevertheless, its extensive attacks on German airfields, while dictated by the current tactical situation, were in keeping with General Arnold's orders to strike the Luftwaffe on the ground and in the air, and should be counted as a phase of MEALL. This air force counted 3,502 effective bomber sorties for the relatively low loss of 61 heavy bombers. A total of 11,051 tons of bombs were dropped on all targets, and fighter and bomber claims of enemy planes destroyed came to 320.\(^{138}\)

The Eighth Air Force was likewise handicapped by the over-present problem of weather. Although not involved in supporting a land battle, its program of operations was somewhat thrown off balance by the appearance of new and totally unexpected targets with a high priority. These were the German rocket-plane installations, at first known as "construction works" and later as W.B. targets, which began to stud the Channel coast of France late in 1943. Although there had been a few exploratory raids in the autumn, really serious attacks did not begin until December. From that month until the end of March, both the Eighth and Ninth Air Forces were forced to deliver repeated attacks against these menacing installations. Thus, the W.B. targets combined with weather to make MEALL operations difficult. The Ninth Air Force, for example, was so occupied with missions against W.B. that it was able to bomb only one airfield, that at Cherbourg/Houpertus, which was hit twice as a secondary target on 7 January.\(^{139}\)

In spite of their losses, the Luftwaffe was still able to take a vigorous defense of targets it considered vital. On some occasions,
deep penetrations were opposed by as many as 25 enemy fighter planes, and nearly all the important missions were met by at least 100 fighters. It was evident that the enemy was still experimenting with all kinds of aerial weapons in the hope of meeting the attacks on his industries. Aircraft bombs, glide bombs, parachute bombs, and even bombs on cables were used at one time or another against our formations. Rockets were constantly fired by enemy planes during the air battles, and were responsible for a good many losses. Nevertheless, our losses remained relatively low; the 203 bombers destroyed in January were only 1.3 per cent of the effective sorties. Against this loss, the VIII Bomber Command dropped 12,397 tons, and made claims of 582-160-129. If the Ritter Command's claims are added to these figures, we get the overall claim of 795 German planes of all types destroyed during January. However, there is strong reason for believing these claims were unreasonably high, and General Doolittle once stated as much, urging his lower-echelon commanders to see that all figures were as accurate as possible.

The 23d was now into its fourth phase, according to the original schedule. It had been assumed that by 1944, air operations would be designed to prepare for the coaling invasion of the Continent and that the Luftwaffe would not be a serious threat. But in January, the Luftwaffe was still very much of a threat. An 813 study estimated that the He-119 program was seven months behind schedule and the Fw-190 was four; nevertheless, the Air Ministry's figures showed an increase of 59 single-engine planes over the December production figures. If the weather during February continued to prevent deep penetrations of the Reich, perhaps the German aircraft production would again reach the
high figures of July 1943.

On the 24th of January, General Arnold discussed the situation in a letter to General Spaatz. He was concerned over the small number of toners being sent to destroy important targets, and feared that our air superiority was being divided up into small forces assigned to targets all over Europe. "Can't we, some day, and not too far distant," he concluded, "send out a big number—and I mean a big number—of toners to hit something in the nature of an aircraft factory and lay it flat?"146 The answer to this question was to come in the raids of 20-25 February, the famous "Big Week" of the U. S. Army Air Forces.
Chapter V

THE EIG MI 11 AND ITS BACKGROUND

At the end of January, the Air Ministry estimates of G.F monthly production were as follows:

- 3/4 fighters: 650
- 1/2 fighters: 190
- LR bombers and reconnaissance a/c: 315

Following the February attacks, especially the period from the 20th through the 25th, known as the Big Week, Air Ministry estimates indicated a drop in production to these figures:

- 3/4 fighters: 245
- 1/2 fighters: 55
- LR bombers and reconnaissance a/c: 210

This achievement was the result of the heaviest bomber attacks yet mounted in the air war, plus the determination of General Spaatz to press home the offensive against the Luftwaffe. In a letter of 23 January 1944, to Robert S. Lovett, Assistant Secretary of War for Air, he stated his coming plans:

I believe . . . that the ability to apply the pressure from two sides against the middle can be utilized to the discomfiture of the enemy. My tendency will be to place a little bit more emphasis upon nailing the enemy on his aircrews whenever possible, and force him to fight under conditions most advantageous to us. There are certain essential targets, however, such as fighter factories and ball-bearing works, beyond fighter cover, which must be hit when weather conditions permit accurate bombing results. These attacks will no doubt result in heavy losses, but will materially reduce our later losses.
Shortly after, the Air Ministry issued a comprehensive bombardment program for the Eighth, Fifteenth, and British bomber commands. First and equal priority was to go to single-engine and twin-engine fighter aircraft and component production. The Eighth Air Force's targets were listed in the following order:

1. He-111 plant at Leipzig
2. He-111 plant at Memmingen/Brünning (also the Fifteenth)
3. F-190 plant at Fieschertal
4. He-110 plant at Götha
5. He-110 plants at Ansbach, Halle, and Oschersleben
6. He-110 plant at Rumburk
7. He-110 assembly (fuselage) at Horten
8. He-110 assembly at Hesse and Atau
9. He-110 plant at Schneidau

For the Fifteenth Air Force, the first-priority aircraft production centers were:

1. He-119 assembly plant at Memmingen/Brünning
2. He-119 assembly plant at Memmingen
3. He-119 assembly plant at Steyr
4. He-119 components plant at Salzburg
5. He-119 assembly plant at Solari, Entenfledes (Hungary)
6. He-119 assembly plant at Schieflach

The RAF was to accord first priority to the following industrial cities: Schneidau, Leipzig, Rumburk, Ansbach, Halle, and Götha. The weather was not suitable for priority objectives, both the AF Bomber Command and the Eighth Air Force were to attack Berlin if conditions permitted. Ball-bearing plants were also given an equal priority with aircraft establishment.

With the question of bombing policy and targets settled, other problems were dealt with. In order to enable both bomber crews and fighter pilots to understand each other’s problems, a fighter liaison officer was henceforth to be sent to each US bomb unit division in the Eighth Air Force. At the same time, the two fighter squadrons prepared...
A book on the tactics and techniques of fighter escort which was to serve as a guide, not only for the liaison officer, but also for staff officers and the combatant divisions. When unusual problems were being discussed with the concern fighters as well as bombers, fighter personnel were to attend the operational critiques held at bomber command headquarters. Henceforth, fighter command intelligence had to receive more information from the bomber command to where and when the heaviest attacks came, tactics employed by the enemy, and so on. It was hoped that in this way closer coordination between bomber and fighter groups might be achieved, and more effective escort missions be flown.

The reaction of claims, so often the object of criticism by both British and American authorities, was very clear in February. As General Doolittle stated, the Eighth Air Force's air-to-air claims undoubtedly had been high. In an effort to avoid duplicate claims, a new system for recording them was developed and sent to the lower echelons. However, it is not certain that much was accomplished. Because of the close formations flown by the heavy bombers, certain fighters shot down were almost always the target of several pursuers. In this connection, it is interesting to point out that, after his capture, Ernst Gerling stated our claims were usually about three times the actual losses.

The heaviest loss in fighter pilots, according to the former chief of the Luftwaffe, was on 1 January 1945 when approximately 100 pilots were shot down. In spite of all efforts, claims continued to be difficult to evaluate throughout the war.

The first part of February was, as General Spaatz had indicated it
might be, largely given over to attacks on German airfields. In the 5th, the Eighth went on a big sweep of five C.4 training bases and one assembly and repair depot. All the targets were in France. A total of 509 bombers, from an available effective strength of 655, was distributed to Chateauroux, Orleans/Orly, Tours, Noyon, and Chateaudun. Reilly had originally been included in the target list, but since it was covered with cloud, the repair depot at Villacoublay was bombed instead. Some 1,200 tons were dropped with excellent or good results at all targets except Chateaudun where results were estimated as fair. Only two bombers and two fighters were lost and the total claims were 15-5-6.11

On the 6th, the Eighth was out again in force. This time 642 heavies were sent to strike targets in the Pas de Calais area, but found it covered by 10-10 cloud; consequently eight targets of opportunity were bombed instead. Among these were the airfields at Chateaudun, St. na"é de l'Oore, Mureux/Fauville, and Seen/Carpique. The VIII Fighter Command and the R.A.F. provided 632 escorts.12

Two days later, the Fifteenth attacked the airstrips at Viterbo, Tarquina, and Orvieto with small task forces. Of the 44 aircraft present at Viterbo, 6 were probably destroyed and 4 damaged. All three fields were in central Italy a short distance north of Rome,13 and all were in fighter range of the beleaguered Allied beachhead.

On the 10th, the Eighth scheduled a mission to attack targets in the Brunswick area and also the Ghent-Jijon airstrip in Holland. However, adverse weather and the failure of IFF equipment interfered with the 31 Liberators dispatched to the airstrip and only 27 attacked. Unfortunately two aia-air collisions occurred, causing the loss of three
The 119 Flying Fortresses that were sent to Brunswick experienced some weather trouble, but two of the three wings found holes in the overcast and were able to drop their bombs visually. Strike photos indicated that the 350 tons of bombs covered the area of the old town with good results, although it was not possible to tell if the aircraft establishments there had been hit. It had been hoped that the attack on Gilze-Rijen would cause the Germans to divert some of the fighter force in this direction. Unfortunately the G.F was not deceived. Furthermore, bad weather caused the withdrawal escorts to be delayed in meeting the formations and two groups completely missed the rendezvous; this gave the Luftwaffe its opportunity. About 350 fighters attacked the bomber formations. Contrails were exceptionally heavy and afforded the enemy an excellent cover from which to make sudden strikes. Our claims were 55-2-42, but the cost was high; 8 fighters and 27 bombers were destroyed.

The 216th operation on the 11th, although not directed against aPLANTX target, is of considerable interest because of what looked like a possible change in G.F tactics. Heretofore, it had been sometimes difficult for our fighters to get the German fighters to engage them. The G.F usually preferred to keep away from the Mustangs, Thunderbolt, and Lightnings in order to concentrate on the bombers. However, in this mission the opposite technique was followed. The Germans abandoned their usual tactics and turned viciously on the fighters. Several sharp engagements took place. As a result, the American escorts claimed 32-3-22, but lost 14 of their own number—a high figure for fighters. In addition, 4 P-47's, 2 P-39's, and 1 P-51 were seriously
damaged. When General Arnold received this information he was quick to see the possibility of a change in G.I.F. tactics, and he cabled General Spaatz to inquire if our fighters were going to abandon their escort functions to take aggressive action against German fighters whenever encountered. Replying for General Spaatz, General Anderson stated that they welcomed this aggressive action against the fighters as it permitted them to restore considerable freedom of action to our escorts who would now be able to force the Germans into combat. As it turned out, this did not mark the beginning of a new policy and other missions found the Luftwaffe none too anxious to engage the Thunderbolts and Mustangs, preferring instead to save ammunition and gasoline for the big formations of heavy bombers.

Certainly these operations were not the "big number" of bombers out to lay something "flat" that General Arnold had been hoping for. Nevertheless, such an operation involving both the Eighth and Fifteenth Air Forces had been scheduled for some time. One of the principal motives in the activation of the Fifteenth had been the hope that the two strategic bombing forces could coordinate their joint operations. It was confidently expected that the Plo Valley would soon be available for Anglo-American air bases and that the Fifteenth and the Eighth would integrate their attacks on German targets with frequent joint raids, shuttles, one-two punches, etc. The Plo Valley remained in enemy hands, but in early December a plan for a combined attack on the German aircraft industry was being drawn up under the code name of "QUANT." It is not clear if this operation was actually planned for 1943, although one writer suggests that it was first scheduled for
12 December, and that supply deficiencies and weather had forced a cancellation.\textsuperscript{21}

\textsuperscript{21} It was definitely scheduled for January, and it was hoped that weather conditions on the 15th might be suitable for combined operations, but the plans had to be canceled. Fog bound down the English bases and storms lay along the air routes beyond the Alps.\textsuperscript{22}

On the 23d, General Spaatz cabled General Arnold that he had been going into the weather situation carefully with Anderson, Doolittle, LeMay, Hodges, and Williams. He felt that unless some frequency of operation could be maintained and increased pressure applied to the " Hun Air Force," necessary wustage would not be obtained.\textsuperscript{23}

Hoping that February might provide the opportunity for this increased pressure, USSTAF, on the 3d, set up an elaborate system for coordinating operations. Coordinated actions might be instituted by either air force, or they could be brought about by the Combined Operational Planning Committee. The commanding general of USSTAF could also order a combined operation and it could be canceled only by him, except in an extreme emergency in the land battle in Italy when the theater commander could commandeer bomber support for his ground troops.\textsuperscript{24}

Another combined operation was ordered for the 9th as there seemed a chance that the weather might be favorable. Some 843 heavy bombers were actually dispatched by the Eighth, but were recalled before they had crossed the English coast. The Fifteenth was held down by inoperative bases and deteriorating weather conditions along the route and consequently its bombers did not take to the air.\textsuperscript{25} General Baker wrote to General Spaatz that he was "most disappointed that our joint plan for
operation was again messed up by the weather last night and today. One
day we shall set on with that job. I am personally certain there has
been no decent day for it since last August 18th. That is almost unbe-
lievable but nevertheless true.26

Meanwhile in the United Kingdom, Maj. Gen. F. L. Anderson, Spaatz's
deputy for operations, was still hopeful that a few good days might be
vouchsafed to them, although his weather experts cheerfully assured him
that the chances were 3 to 1 against it.27 In spite of this dubious
prediction, he wrote to General Eaker on the 11th that he was "now in
the midst of preparing a plan which will best exploit the destruction
of the aircraft and ball-bearing factories."28 His confidence was
justified. The atmospheric conditions took a turn for the better, and
on the 17th Anderson was informed that a stretch of relatively good
weather seemed to be shaping up.29 With this long-awaited gift of
Fortune almost in his hands, General Spaatz began to set in motion the
machinery for a combined offensive by the Eighth and Fifteenth, when
suddenly a new obstacle appeared.30

As this study has already pointed out, the directive which pro-
vided for the control of the Fifteenth permitted the theater commander
to make use of the strategic air arm in case of an emergency. The
battle at the Anzio beachhead, which had been going on since 22 January,
was reaching a climax. On the night of 15-16 February, the Germans
launched a heavy counterattack on the beachhead with intensive air and
artillery preparation. The situation was critical, and General Clark
and Maj. Gen. John H. Cannon of the Tactical Air Force felt the need
of assistance from the heavy bombers of the strategic force.31 This
was of course, the possibility foreseen in the directive giving General Wilson the authority temporarily to withdraw the Fifteenth from FOLD-FLAK to assist in the land battle. Nevertheless, General Eaker, for the sake of precedent, wished to prevent a situation where an official demarche by General Wilson would be necessary. Consequently, when it was apparent that a combined operation was to take place on the 20th, General Eaker signaled Spaatz on their private wire as follows:

Re your mission assignment to Fifteenth for tomorrow, here is our situation: (a.) Clark and Cannon believe tomorrow will be critical day in beachhead; both hope for full heavy bomber help. Cannon believes some heavies must help. (b.) Our weather prophets believe we have little chance for visual targets in South Germany. You speak of area targets, we have no H2X as you know. In view of foregoing we face this problem: Shall General Wilson declare emergency under CCS directive and employ heavies. I hope to avoid this. Will you therefore tell me as soon as possible whether your other planned attacks require our help as diversion even with no prospect of visual bombing. In that event we must make a split and send five or six groups on one or two targets you name and cut at least four on beachhead support. In view of our dilemma please give me desires.

General Spaatz immediately gave Eaker a release from the combined operation, but he was concerned for fear a continuous emergency at the beachhead might interfere with FOLD-FLAK. During the next two or three days the favorable weather conditions, which had been so anxiously awaited for almost three months, might occur. Consequently, although he appreciated the emergency conditions at the beachhead and was willing to release the Fifteenth from participation in the FOLD-FLAK operation scheduled for the 20th, he hoped that nothing "would prevent heavy force of Fifteenth Air Force from being utilized against FOLD-FLAK targets Monday and Tuesday [21 and 22 February] if weather permits."
ground forces without the necessity of General Wilson's intervention under the provisions of the 503 directive. As a matter of fact, such action was never necessary, because this procedure set the pattern for the future. There were at least six occasions when the effort of the heavy bombers was swaying to the side of the ground forces, and on each occasion the cooperation was secured on a request basis. 34 As a result of the arrangement with General Spaatz, the Fifteenth dispatched 105 bombers to the beachhead on the 20th, and another force of 156 attempted to reach Regensburg but was prevented by the weather which, in south Germany at least, failed to live up to expectations. It was not until the 22d that a combined operation was possible. 35

Meanwhile, the Eighth Air Force was preparing to take advantage of the clearing weather promised for the 20th. Since the targets to be bombed lay in central and eastern Germany, the R.A.F coordinated its night bombing with A.F.F plans by hitting Leipzig and Berlin during the night of 19-20 February. 36 At that time the weather forecast indicated relatively favorable weather conditions: small, low clouds were predicted for central Germany, nil to 3/10 cloud for eastern and 6/10 to 8/10 low cloud for northern Germany. 37

Therefore, it was decided to send out the heaviest possible force against some 12 targets connected with the production of the Me-109, Me-110, Ju-88, Ju-188, and the F-190. The F. facilities at Reising, Rosen, and Tutow in northern Germany were one general objective, and in the Leipzig/Brunswick area the targets included the Leipzig-Lochau airfield, the Irla Messerschmitt factory, the Junkers repair and assembly plant, the Irla machine works at Hinterblick and Blaustadendorf,
the Junkers airframe and engine works at Schwerin, Halberstadt, and Bernburg, the He-110 components factories in the Wilhelmsort and Neupertritza suburbs of Brunswick, and the Gothaer Waggonfabrik at Gotha, a component and assembly plant for the He-110.33

Plans for the mission were very carefully worked out. The heaviest weight of the attack was to fall on the Leipzig/Brunswick targets, with the force dispatched to the Rosen/Tutow area acting as a diversion on the right. The routes were chosen to deceive the enemy as long as possible concerning the real objectives, and to make it appear as though Berlin might be the destination. The approach to the Rosen targets was to be a wide swing to the north over Denmark just about the same time that the main task force to the south would be entering the enemy's radar screen. This was to prevent the enemy controller from dispatching his full fighter strength against the flanking attack from the north, and also to force him to split his forces.39 It was also planned that the Fifteenth should come up from the south to strike at Regensburg, but it has already been pointed out that weather and other commitments interfered.

At 0930 on 20 February the first formations took off on what was then the largest force of heavy bombers ever employed on a daylight mission.40 Participating were 12 combat wings totaling 1,003 bombers. To protect this tremendous force, the American fighters flew 332 sorties.41 This was the "really big" mission that General Arnold had been hoping for, and it was out to lay the German aircraft industry "flat."

The flanking diversionary forces found the weather not quite so
good as had been expected. After was overcast and the bombers used blind-bombing techniques, or attacked targets of opportunity. Here was no observation of results. Finding the overcast equally heavy at Reen and Greising, the planes decided to bomb Döberitz as a target of opportunity and dropped 196.5 tons of 15 and 121.3 tons of 30. Considerable damage was done to the Lepumberge shipyard, and the nearest Heinkel airframe and assembly factory at Arienche. In spite of the fact that this was not the major part of the operation, considerable fighter opposition developed.42

Ten combat wings comprised the main task force which was dispatched into central Germany. The routes were flown almost as briefed with good fighter cover. From the behavior of the German fighter controller, it appears evident that the enemy was completely outwitted by the diversion to the north. This force was apparently considered the main thrust and a large force of G.F fighters was dispatched north to intercept it "while the controller who had launched it looked anxiously over his left shoulder at another large bomber force which was approaching the Reich across Holland." Suddenly he decided that the southern force was the main attack and ordered his fighters to return to the Hanover area. This was a fundamental mistake for it brought the enemy interceptors back too late to oppose the bomber formations en route to the objectives. As a result, the enemy was never able to oppose this operation in force.43

As the bombers approached the target area, the overcast broke up and visual bombing was possible. The Leipzig/Nordau airfield and the A.O. messerschmitt factory were attacked by 131 aircraft dropping 21.8 tons of HE bombs and 65.2 tons of incendiaries. Three aircraft factories...
bordering, the field received extensive damage and there were direct hits on the assembly shop of the Dru plant and near-by hangars. The transport-assembly assembly factory was covered with a heavy concentration and some workers installations were damaged. \textit{Überblick:} near Leipzig the weight of the attack fell on the power houses and workshops, a 75 bombs dropped high explosive and incendiaries. In Hamburg the bombers aircraft and aero-engine centers were assaulted by a small force of 37 planes, but the bombers were able to achieve direct hits on factory buildings and possibly air blast damage to a fuselage storage building.\textsuperscript{44} It transpired both the Heppetraktor and Heinkel bomber saliva were successfully loaded and direct hits were scored on the component-producing installations at the former. Due to the overcast, the weather conditions were attained by 39 sorties using blind-bombing techniques and the results were not immediately observable. Targets of opportunity were also hit at Wackerslohe, Halsstadt, and Strassfurt, the first two with fair to good results.\textsuperscript{45}

This operation of the 26th was later judged one of the most successful ever carried out by this air force.\textsuperscript{46} German fighter defense was far better than was expected, uncertainty as to the destination of the bombers may have contributed to this weakness, as well as the weather over Allied and the possible confusion of the night fighters as a result of the heavy night attack in Hamburg which kept the German pilots awak\textsuperscript{46,47} until 5:50. In the words of the historian of the air force, "the bomber force seemed to have been was in either the planning or execution of this day's work."\textsuperscript{48} The total losses were 21 sorties and 4 fighters. The claims of both bombers and fighters were tentatively set at 12.80-80.\textsuperscript{49}
The next day the weather began to deteriorate; the forecast for central and northwest Germany was 5/10 to 7/10 cloud at low level with large breaks. Under such circumstances there was a good chance for some clear targets, and consequently all planes were dispatched against the circuit factories in Brunswick and the major airfields and aircraft storage parks in western Germany. The Brunswick targets and the field and storage parks at Wedel were bombed, but the weather interfered at the other targets. As a result, numerous targets of opportunity were tested, including the airfields at Leiber, Ibbenburen, Hoexter, Neuenburg, Verden, Celle, and Leese, and the armament parks at Kiel. The mission in assault, however, was not all it was intended to be. The third bomb group, originally assigned to a framers, turned south, followed the second group all the way to England, and was far out its planned route to Russia when the error was discovered. Consequently, this wing decided to bomb the fields at Ibbenburen and Verden as targets of opportunity. Later, several of these were indicated on the targets. At Wedel, four storage buildings and two hangars were destroyed while major damage was done to hangars and barracks. A direct hit on an ammunition dump was achieved at Ruse, and a severe explosion followed. The bombing of Brunswick was hard to evaluate, since it was carried out with .50 equipment, but it was believed that most of the bombs fell in the area of the city.

The G.I. reaction was somewhat slow in developing. Some 150 one-man aircraft were airborne but did not attack until the bombers reached the target area. Unfavorable weather conditions may have hindered the
Luftwaffe, but it was also believed that the Air Force defenses were beginning to show the strain which these large-scale operations put upon them. The B-26 bombers of the IX Bomber Command attacked enemy airfields and caused some fighters to become airborne prematurely. The Air Force contributed its share by attacking Stuttgart 12 hours before the IX Bomber Command. American claims were only 15-10-14, and the loss of 16 bombers out of a total of 261 airborne was not considered heavy. Although the weather did not hold up as well as had been expected, General Spatz called General Spatz that he was well pleased with the results of the battle so far. Full pressure was being maintained on the enemy air force, and he was to be allowed no time for recuperation even if it meant some American losses because of weather.54

The forecast for the 22d indicated that southern France and parts of Germany would be clear; it also seemed possible that the air routes over the Alps would be open and that the Fifteenth could at last take part in the big sweep. For the third successive day of this massive attack on the Luftwaffe and its sources of supply, six high-priority targets were selected: (1) the Junkers plant at Muldersdorf, makers of wings for the Ju-88 and -133, (2) the Junkers aircraft components and final assembly at Schwerin-Ruhleben, (3) the 152 components and final assembly of the Ju-190 at Schwerin-Ruhleben, (4) the Junkers assembly at Bremmen; (5) the ball-bearing factory at Schwerin-Ruhleben, and (6) the Gothaer component and assembly plant for the He-110 at Gotha, the largest producer of twin-engine fighters.55 In addition, the Fifteenth was scheduled to bomb the aircraft factories at Krensburg.
To deceive the German fighter control, one combat wing was ordered to attack the Alborg east airfield in north Jutland as a diversionary mission. This force was the first to use aircraft equipped with V-chord, a device to jam the enemy aery. Chimney, hoarding, and urzburch radio sets. Using their jammers, it was hoped that the V-chord planes of this force could deny the Germans the use of their own radar to detect the approach of the main task force. It was also hoped that the diversionary force would hold down a considerable number of German fighter units in the Heligoland light area and prevent their joining with other groups in the defense of central Germany.

These elaborate plans were not too successful. Weather prevented the 55 bombers of the diversionary task force from bombing the Alborg field, and the German fighters were not diverted from the main effort. However, in the opinion of some experts the Fifteenth's attack on Regensburg may have attracted twin-engine fighters that otherwise might have been used against the Eighth's formations. Fourteen combat wings constituted the main effort of the VIII Bomber Command. In the first wave were 259 B-17's headed for Halberstadt, Aschersleben, Bernburg, and Csforsleben. The second formation consisted of 333 B-17's assigned to attack Jena and the third and final wave was made up of 253 B-24's bound for Gotth...

Trouble was encountered from the very beginning. Clouds, snow, haze, and stronger-than-predicted winds considerably disturbed the assembling formations. Some wings managed to get into some sort of order by the time the coast of Holland was reached, but others did not and were forced to abort. The 2d Bomb Division was unable to organize,
and after penetrating about 100 miles inland, it decided to abandon the Gotha mission and bomb targets of opportunity. Unfortunately, the bombardiers did not allow sufficiently for the strong wind and four Dutch towns were bombed by mistake.59

Of the 455 bombers which were actually dispatched, 101 attacked the primary targets and 154 bombed targets of opportunity. Thirty-four aircraft reached Schwerin and dropped 64.5 tons of high explosives and 12.6 tons of incendiaries on the Junkers factory. The concentration on the target was good and it was estimated that the damage was extensive; six large workshops received direct hits. The Junkers factory at Bernburg was hit successfully by 45 bombers dropping 45 tons of GP and 64.9 tons of fragmentation bombs. Only 13 airplanes managed to reach the Halberstadt installations, and photographic cover failed to show any hits on the Junkers factory, although 49.5 tons were dropped. The formations headed for Oschersleben bombed targets of opportunity with generally poor results.60

For the first time during the three days of continuous operations against the German fighter industry, the Luftwaffe reacted vigorously. For one thing, they had an excellent opportunity to inflict considerable damage. The bad weather upset the formations, as has been pointed out, and generally scrambled the timetable and over-all plans. Since many of the groups were looking for targets of opportunity, the schedule for the withdrawal was not adhered to. All this made it very difficult for the escort fighters to give proper support and cover, especially since they were frequently outnumbered by the German fighters. In addition, some of the bombers elected to return along courses north of

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the planned route and this gave the Ruhr defense system time to engage them. All these factors made the mission a costly one; 11 fighters and 41 bombers were lost. The bombers claimed 27-2-31 and the fighters claimed 60-7-25. 61

Meanwhile, the Fifteenth Air Force had at last been able to get its planes into southern Germany. While the Eighth was struggling with weather and the Luftwaffe, the Fifteenth was attacking the great Messerschmitt complex at Regensburg. Sixty-five Flying Fortresses dropped 153 tons of high explosive and incendiary bombs on the Messerschmitt factory; weather prevented an accurate appraisal of the bombing. At the same time, 118 Liberators attacked the aircraft factory at Regensburg/Cobirraubing with GP and incendiary bombs. Here again, poor photos and bad weather prevented an estimate of the results, although visual observations during the attack indicated that the target area was hit, and one considerable explosion was noted. At the same time, 23 unscored B-17's dropped 31 tons of 500-lb. GP bombs on the Zagreb (Yugoslavia) airbase with fair results. 62

Although the operations of 22 February were not among the most successful of the so-called Air Week, they are of special interest because of the fact that both the Eighth and the Fifteenth were able to run coordinated missions. Those who have struggled along with the author of this study so far will recall that one of the arguments for the creation of the Fifteenth Air Force was based on the idea of combined operations with the Eighth. Nevertheless, bad weather and the demands of the land battle in Italy made such coordination relatively rare. In this particular case, it is not clear whether or not the
combination was of much assistance to either force. The losses of the
Lighth, which were heavy, do not appear to have been greatly affected
by the attack on Regensburg or the Zagreb airfields; nor, in this in-
stance, was the operation against the Regensburg factories of sufficient
weight to divert many of the fighter groups from central Germany. The
one-two punch against the German aircraft industry by both the strategic
air forces was still so ethical to be worked out in the future.

The 23d found bad weather settling down on the British Isles and
no operations took place. The Fifteenth sent 102 Liberators to the
Steyraffenheilzi, Steyr, Austria, where they dropped 214
tons of bombs, but without much success, according to the photos which
showed no serious damage to any vital installation. The C.F. reacted
vigorously to this mission and aggressive attacks were launched against
the formations for about 30 minutes. Seven Liberators were seen shot
down and 10 more were missing when the bombers returned to their bases.63
No other attacks were staged by the Fifteenth because of the bad weather.

By the morning of the 24th, climatic conditions had greatly im-
proved, and nil to 3/10 low cloud was promised for most continental areas.
Selecting its targets in furtherance of the over-all plan for the destruc-
tion of the German aircraft industry, the Eighth scheduled something like
a repetition of the first mission of the Big Leek. The targets were the
V.F. Werke I at Schweinfurt, already heavily damaged in prior raids, the
Gothaer Aeronafabrik at Gotha, and a northern diversionary raid on the
aircraft assembly plants at Tutow, Forzen, and Kreising, plus a feint
over the North Sea.64

Elaborate precautions were taken to confuse the C.F. fighters.
Tutow-Fosen-Ireising task force was to leave one hour and 15 minutes before the rest so as to bring the main force into the enemy radar screen as late as possible and not discourage the bulk of the German fighters from attacking the weaker northern forces.\(^65\) In the other hand, it was hoped that the late commitment of the main formations would not give the enemy time to recall his fighter groups moving north toward the Tutow-Fosen-Ireising nexus. The diversionary force dispatched over the North Sea was not intended to bomb anything, but it had the two-fold task of jamming the enemy's radar with its hundred planes and drawing some units of the Luftwaffe away from the target areas. If the timing could be carried out properly, the enemy units attacking the diversionary forces would need refueling about the time the bombers assigned to Jahnsteinfurt and Gotha would be crossing the coast of Holland. A further trick to confuse the German fighter control was the fact that the forces going into northern Germany were so routed as to appear headed for Berlin. The withdrawal routes were plotted south of the Ruhr to pull the G.7 away from the retiring northern forces.\(^66\)

Unfortunately, the behavior of the weather did not fit into these elaborate plans. When the Fosen-Tutow-Ireising task force reached the target area, it was found to be completely overcast. It was therefore decided to bomb Rostock instead, and 230 aircraft dropped 500.6 tons of high explosive and incendiary bombs. Owing to the smoke, recces photos were not available. Sixty-one bombers dropped 150.3 tons prematurely on an unidentified point east of the target with undisclosed results. The diversionary force over the North Sea flew its mission without incident and it does not appear to have deceived the Germans.\(^67\)
Meanwhile, the main forces were proceeding toward their objectives. The Schweinfurt force consisted of 200 Fortresses, while 233 Liberators were assigned to bomb Gotha. At Schweinfurt some 574.3 tons were dropped on the ball-bearing plants with excellent results. Three out of four of the factories sustained major damage, and there were additional hits on machine shops, storage buildings, and power stations. The tonnage on Gotha was not as heavy as had been expected owing to the fact that 44 3-24's dropped 107.4 tons on Eisenach by mistake. The remaining 171 Liberators found the proper target and covered it with 421.1 tons of incendiaries and high explosives. The Gothaer Waggonfabrik lost four large workshops, while three others and several medium workshops were damaged. In a near-by G-F airfield a heavy concentration of bursts covered the field, barracks, and administration buildings.

In spite of a large fighter cover—301 fighters were airborne, and 787 sorties were flown—the bomber losses were the heaviest of the Big Lock. For one thing, an unexpectedly strong tail wind brought the lead groups into the target area ahead of schedule and carried them away from their escorts at times. G-F opposition was moderate in the Schweinfurt area and only 11 sorties were lost there, but at Gotha the defense was stubborn and intense. As the Liberators retired from the area, they were subjected to heavy attacks, apparently because they were flying at a considerably lower altitude than the B-17's. A total of 33 5-24's was lost on the Gotha mission, and losses for the entire operation came to 49 bombers and 10 fighters. The heavies claimed 77-7-31 enemy losses, and fighter claims were 37-5-14.
The Fifteenth Air Force was also operational on the 24th. The target was the Steyr-Walker Aircraft Factory at Steyr, Austria. Eighty-seven B-17's dropped 261 tons of 22,000-lb. GP bombs in the target area. Several of the machine shops were badly damaged, one building receiving 12 direct hits, another 6, and a third 1. In the main part of the factory, 3 direct hits landed on the machine shops, 2 were scored on assemblies, and 1 on the vehicle assembly shop. About 110 enemy aircraft of all types subjected the Fifteenth's bombers to an hour's heavy attack. Rockets and aerial bombs were employed, and 16 B-17's, 2 F-33's, and 1 B-47 were destroyed. The attack seemed to be concentrated on the rear formations; the 26th Group flying in that position lost 10 planes. American claims against the R.A.F. were 35-12-5.71

During the hours following this double operation by the Eighth and Fifteenth, the weather continued to improve, and the R.A.F. was able to visit Schweinfurt on the night of the 24th in the wake of the Eleventh's successful mission a few hours before. In view of the heavy strain being imposed on the Luftwaffe, and the weather forecast of generally clear for inland continental areas on 25 February, General Spaatz decided to mount another attack in great strength against German aircraft production. Both the two strategic air forces were assigned to batter the great Me-109 complex at Merseburg, and in addition the Eighth was to attack the Messerschmitt parent plant and research center at Augsburg, the ball-bearing factory at Stuttgart, and the Me-110 component and assembly plant at Darmstadt. As in the two previous air battles, a small larger force was to operate against the German radar from the North Sea.72
The first phase of the highly successful operations of the 25th
was carried out by the Fifteenth Air Force. Striking north from Italian
bases, 40 B-17’s and 103 B-24’s headed for Regensburg, escorted by 38
P-47’s and 95 P-39’s. Just as this task force was crossing the northern
tip of the Adriatic, they sighted vapor trails 4,000 to 5,000 feet ahead
and above the formations, and realized that the Luftwaffe was waiting
for them. Attacks began immediately afterward and continued for one
hour and 30 minutes without interruption. The original attack force
probably came from the mine-rauz area... As the battle developed re-
placements moved in from Linz-Arnstadt. As in the mission of 24 February,
the rear groups were subjected to the hottest part of the assault.73

The lead elements of the rear groups were attacked by single- or twin-
engine fighters attacking in threes-in-line formations, or sometimes in line
 abreast, from above, head on, and below. Twin-engine fighters in
formations of ten in line abreast, consisting of four or five deep,
were observed. Four echelons attacked in successive waves, each
using a barrage of cannon fire on a specific element of the bomber
formation. It appeared that at least 1 P-47 was lost to each pass.

In spite of this fierce opposition, the bombers reached the Re-
ensburg/Refining Aircraft Factory, and indicated that injury on it. Inset
showed at least 24 direct hits and 19 near misses on the final assembly
shop, and the component erection shop for wing and fuselages. The
fires were burning as the bombers left the area.74 Various losses were
37 bombers.

Like this operation, this mission carried out, 700 heavy bombers of
the Eighth were sent through the air toward their various targets.
No enemies were flown over, but it is claimed that enemy anti-aircraft
fire caused many of the formations to miss at their targets; consequently, one of
the lead rear groups had to return for more and was without escort.
support as the - reached the turn at area. There was also a tendency
in the sit of one of the trials to the north of the intended
route, with men at the hill in range of the defenses of the brick area
and - a lookout occurred here.75

Seconds 45 minutes after the last bomber of the sixteenth had
left the site of Poplar/Bruslina, the first of 102 Fortresses
of the 16th appeared over the target and began the attack run. 

Total of 176 tons of high explosive and 79.7 tons of incendiaries were
cropped in this mission and the direct aerial aircraft plant received
further damage.76 An interpretation of photos taken the day following
this attack also noted the almost complete destruction of the entire
plant.77

Other targets were also under attack. A force of 149 B-17's dropped
a heavy load of high explosives and fragmentation bombs on the Focke-
Wulf plant at Peenemunde. The target was well covered and also were scored on dress shops, sub-assemblies, a collor
house, and a large group of the 50 aircraft visible on the road,
it was believed that at least 25 were destroyed.78 At the Messerschmitt
motor, 40 aircraft, 100 B-17's dropped 369.5 tons of bombs 133.9 tons
of 25, these are damage on caused some injuries,disabled, and
research and administration buildings. The main target at Time was the
Messerschmitt engine and was 311ft. Factor of reduction was diminished
and damaged after receiving 32 tons of 3.500 tons of 1, and 110.3
tons of fragmentation bombs, 8 of the target was in alius, and at the
47 aircraft were in the field, 5 were probably damaged.79 The last
successful move of these operations was an attack on the ball-bearing
The 11th Air Corps was less than expected. For the attack on a major industrial center were not aggressive, but became progressively weaker as they withdrew. Although 31 bombers were lost during the close action, this was not a high price to pay for the successful bombing of heavy targets, considering the number of aircraft involved. Bomber claims were 33-3-9, and fighter claims were 5-4-13.31

According to the Tactical Mission Report, "The simultaneous threat against southern Germany and the direction by the two forces of the U.S. Strategic Air Force appears to have caused the enemy controller to dissipate his forces to the extent that neither of the attacking forces could be successfully countered."

The combined operation of 25 February ended the six-day offensive against the sources of German aircraft production and marked the virtual end of February's operations. The outstanding characteristic of this six-day period was the high degree of coordination between the Eighth and Fifteenth Air Forces, and between the Eighth and the R.A.F. The heavy night attacks which the British unleashed against Libau (19-20 February), Stuttgart (20-21 February), Schweinfurt (24-25 February), and Augsburg (25-26 February) were closely connected with the Eighth's operations; likewise, the Fifteenth, whenever weather permitted, tried to time its raids against southern Germany and Austria to coincide with

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336 E-17's attempted to attack the Messerschmitt plant in Brunswick on 29 February, but owing to smoke, there was no observation of results.
the Eighth's assaults on northern Europe. In the opinion of the second historian, "This coordination, together with other counter-air force aspects of these operations, unquestionably held Allied bomber losses far below what they might otherwise have been against these stoutly defended targets." Some idea of the scale of the effort involved can be gained from the following table:

**Operations 20–25 February 1944**

<table>
<thead>
<tr>
<th></th>
<th>8th</th>
<th>15th</th>
<th>Total</th>
<th>RAF</th>
<th>Grand total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heavy bombers dispatched</td>
<td>3,600</td>
<td>1,560</td>
<td>5,160</td>
<td>2,740</td>
<td>7,820</td>
</tr>
<tr>
<td>Heavy bombers attacking</td>
<td>3,116</td>
<td>200</td>
<td>3,316</td>
<td>2,300</td>
<td>5,616</td>
</tr>
<tr>
<td>Tonnage dropped</td>
<td>5,150</td>
<td>1,825</td>
<td>6,975</td>
<td>3,330</td>
<td>15,305</td>
</tr>
</tbody>
</table>

The damage inflicted on the German aircraft industry seems to have been great. Erla at Leipzig was one of the worst hit, and its pre-raid output of 250 He-109's per month fell to 100 in February and nil in March, according to U.S. estimates. The complex at Regensburg was bombed by both strategic air forces and heavily damaged. It was believed that its January output of 225 He-109's could not be regained until August 1944, and it was assumed that the Germans would prefer to disperse this factory rather than try to rebuild at the ruined site. The U.50 plant at Schwerin was not quite so badly damaged by the attacks of 11 January, 20 and 22 February. It was assumed that only about a month's output was lost. The units of the Junkers complex at Halberstadt, Schwerin, and Bernburg were believed to have been seriously hurt. The attacks on Halberstadt (wings) and Schwerin (fuselages) probably complemented each other, although the results of the attacks on these "deep processes" could hardly be felt for a month or so.

U.S. estimated that serious ancillary effects would result from the fact that many of these blows were almost simultaneous. Some of the
factories lost stocks of tools, and jig-making machinery. This could have serious effect, since outside jig makers were undoubtedly swamped with orders. The scheduled transfer of I.G and Gothaer to the production of the F-190 might have been started by the time of the air raid on Gotha. If this were so, the heavy destruction at Gotha might have wiped out a large supply of F-190 jigs, a fact which would indirectly affect other factories. And finally, the casualties, which were probably heavy, could be expected to slow down production by causing a shortage of skilled labor.\(^3\)

The Ministry estimates tended to support the optimistic interpretation of US. March estimates for the production of the Me-109 were 225, as compared with the 100 estimated for February; these figures also included salvaged as well as new output.\(^3\) However, the F-190 factories, which were less severely damaged in the Elbe dock attacks, managed to increase production from 200 in February to 275 in March—these figures again including salvaged planes.\(^0\)

Information obtained from high-ranking officers in the Wehrmacht and Luftwaffe after the collapse of Germany testifies to the effectiveness of the February attacks. In the opinion of Generalleutnant Galland, one of the most famous German fighter pilots, the attacks by our strategic bombers early in 1944 "practically destroyed the German fighter production for a short period."\(^1\) Of particular significance is the evidence contributed by Dr. Earl Fryday, chief of the Airframe Industry, while being interrogated by American intelligence officers.\(^2\)

Could you say roughly that as a direct result of the February 1944 attacks, approximately four thousand aircraft were lost to the German Air Force? Your statement was that 50% of the production was lost for two and one-half months.
Yes, that is right. Only an exceptional effort could come up to that figure and that was an effort which we could not have kept up.

Operations for the month as a whole were the largest yet undertaken in the air war. The Eighth Air Force put 7,100 bombers over the target for a loss of only 3.8 of the attacking force. Bomb tonnage was 19,110, and bomber and fighter claims of destroyed enemy aircraft amounted to 740 planes. The Fifteenth Air Force was more hampered by weather and enemy action. Some 2,300 effective bomber sorties were carried out and losses were 5.4 per cent. The bomb load came to 0,747 tons, and 355 enemy aircraft were claimed as destroyed.

As the Big 'One' ended, General Marshall cabled his congratulations to the Commanding General of the U. S. Strategic Air Forces and stated that his attacks on Legensburg, Leipzig, Gotha, Luxemburg, and other vital fighter factories were wiping out German fighter production. He expressed his thanks to all ranks in the command from top to bottom for the superb job they were doing and wished them all the best luck in continuing to carry destruction through the heart of Germany.

The Eighth's participation in the operations of 20-25 February can be shown by the following table:

<table>
<thead>
<tr>
<th>Date</th>
<th>Dispatched</th>
<th>Lost</th>
<th>Claims</th>
</tr>
</thead>
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<tr>
<td>20-2</td>
<td>1043</td>
<td>21</td>
<td>05-33-39</td>
</tr>
<tr>
<td>21-2</td>
<td>361</td>
<td>16</td>
<td>19-10-14</td>
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<tr>
<td>22-2</td>
<td>407</td>
<td>41</td>
<td>24-17-17</td>
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<td>24-2</td>
<td>399</td>
<td>49</td>
<td>33-22-42</td>
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<td>25-2</td>
<td>754</td>
<td>31</td>
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Chapter VI

GERMAN INDUSTRIES DURING THE FALL OF 1943

The period from the end of the Big Week to D-Day constitutes a definite phase in the war against the Luftwaffe and its supporting industries. It is characterized by certain changes of policy, not only of the attacking forces, but also on the part of the Germans. During the first large-scale attacks in the fall of 1943, the Germans often tried to rebuild their plants at the original sites; where this was not practical, they tried to spread the resources, originally planned for expansion, into dispersed factories. As the attacks increased in weight and number, the process of dispersal was greatly accelerated, and it is quite possible that this, in addition to the air offensive, helped to keep down production during the last three months of 1943. However, the Germans were gambling for survival and could afford to forego a temporary advantage if it would profit them in the long run. "The decision to disperse undoubtedly saved aircraft production," and thus the C.E, although terribly crippled, was able to survive the attacks of 20-25 February.

During the three months that elapsed between the end of BIG WEEK and the immediate preparation for D-Day, German aircraft factories were distributed out of the great complexes and into new centers.

*This Air Force missions which were only partly devoted to BIG WEEK are not treated here. For an account of temporary air operations, see AF Aircraft studies Nos. 32 and 30.
soe of which were underground. The Italian aircraft industry was brought more closely under German control, and tools and machinery were sent from the axis to improve production methods. In February, the monthly production of Italian aircraft was estimated as follows:

**Fighters:**
- L.635 25
- L.602 25
- Re-2002 15
- C-55 22

**Trainers:**
- C.314 30

**Russian transports:**
- L-72 35

Italian production of aero-engines (92-603 and 85-605) was estimated at 150 per month, and it was believed that some of the Wiener-Jonz machinery had been shipped to Italy.

A mobile additional L-109 output was being developed at Brasov, Rumania, and Gyor, Hungary. The Hungarian L-9 and machinery works, in this latter city, had since 1941 been manufacturing a wide variety of equipment. According to Official Intelligence, plans for 1944 production called for a monthly output of 50 L-109's, and it was believed that the Germans were sending production machinery to Gyor to avoid the bombings further west.

These new developments in German aircraft production were largely within the Fifteenth's sphere of operation. With its principal TFH-11-41 effort directed against Russian aircraft production, it had attacked the lower Ninth Air complex on November 8, stopped work there for several weeks. At the end of March, the Fifteenth had ready to turn its attention to the second unit of the complex, the Fifteenth Unit.
Aircraft factory in the Yaroslavl area, as well as the production centers at Yar and N. In addition, atttention is focused on the motor and Diesel plant at Izhevsk, the motor plant at Chelyabinsk (Kuznecov), the Kuznecov motor plant at Voronezh, and another motor plant in the Yaroslavl area. 

1. Motor plant at Voronezh (Kuznecov) 
2. Diesel (Kuznecov) 
3. Motor plant at Chelyabinsk (Kuznecov) 
4. Motor plant at Yar (N) 
5. Motor plant at N. 
6. Motor plant at Yaroslavl (50-227) 
7. Motor plant at Yaroslavl (50-228) 
8. Motor plant at Yaroslavl (50-229)

Additional information on the eastward dispersal of the O.S. was not forthcoming. Photo reconnaissance of the Voskhod/Scopus airfield revealed an assembly plant that seemed to be engaged in the final assembly of the MiG-40, possibly in connection with the Yaroslavl engine plant at Yaroslavl (Kuznecov). At this plant at Yaroslavl, the monthly output was estimated to be 30 aircraft. Since the O.S. is the main aircraft industry and has been in existence since 1918, it is believed that the O.S. could increase its output to 1,000 aircraft in the future.

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allies. Sometimes, the attacks were successful, as the German forces were caught off guard.

Unfortunately, the Eighth Air Force faced significant challenges throughout the spring of 1944. Although the weather in western Europe was not too bad, there were numerous targets in this area, and storms in the trans-Alpine region frequently prevented the deep penetration into the heart of the continent. As a result, the Eighth Air Force focused on supporting the ground forces, especially in Italy and the Mediterranean region.

In Italy, the Eighth Air Force continued its attacks on strategic targets, as directed by the Ninth Air Force. There was a fundamental change in priorities, and the Luftwaffe's ability to supply its forces still remained a significant challenge. The Eighth Air Force increased the number and scope of its missions, with around 1,156 heavy bombers operational, providing support to the ground forces. The deliberate policy of the Eighth Air Force was to support the ground forces by all possible means, as described by General Spaatz.

According to General Spaatz, three of the major attacks were flown without an attempt at deception. In each attack, the route followed in each attack was the same. General Spaatz succinctly characterized the situation when he said: "It is now a case of either the sun will hold or we will hold." Despite the odds, the Eighth Air Force remained committed to its objectives.
In theory, B-17s felt it desirable to relax a little its pressure against the bases and facilities of the Luftwaffe in order to pay greater attention to high-priority industrial targets. It was reasoned that since the great increase of fighter strength and the development of the long-range fighter practically assured us air superiority, it would be possible to keep the German fighter force "in a state of relative impotence rather than complete destruction." However, this idea remained largely theoretical during March, for the weather often arbitrarily forced attacks on western airfields by covering everything further inland with a deep overcast.

The Eighth's first counter-air force operation of the month occurred on 2 March. While a heavy force was sent to Frankfurt, 100 bombers attacked the airfield at the famous old cathedral city of Chartres, France. Some 150 tons of explosives were dropped without any opposition; the ground haze coming up from the fields made aiming difficult and the strike photos indicated only fair results.

Airfields were also the target for the Fifteenth. On the 3d, Viterbo, Cenina, and Fabbrica di Roma were bombed by small forces without conspicuous success. The Eighth returned to the attack on 5 March by scheduling missions against German-held airbases in France. Unfortunately, 10/10 cloud covered all the primary targets and the 219 Liberators were forced to bomb Formac, Bergerac, and Landes de Bussac through holes in the overcast. The results varied; they were believed to be good at Cognac and Bergerac, but were very ineffective at Landes de Bussac. Four bombers were destroyed and claims of 14-0-12 were made.
In spite of the heavy blows delivered against it in February, the Luftwaffe was still capable of a fierce defense of targets it considered vital. This was clearly shown by the great air battle of March. On this day, 740 heavy bombers were dispatched by the Eighth Against Berlin. In spite of the fact that the bombers were escorted by 790 fighters of the VIII and IX Fighter Commands, and two squadrons of 2.F. Mustangs, the opposition was unusually heavy. It was estimated that approximately 615 German fighters rose to defend the Reich, making this the largest defensive effort yet carried out by the G.F. In addition to the usual single-engine fighters, twin-engine and single-engine night fighters were called into the battle. As the formations reached the Hanover area, the 31 division was subjected to intense attack. The bombers of this division formed a line of combat wing pairs approximately sixty miles long, with the escort fighters slightly weaker in the middle blan at the two ends. Taking advantage of this, the German fighter controller attacked the front and the rear of the formation with forces of moderate size, and while the escort were occupied with this attack, he threw more than 100 fighters at the momentarily unprotected center. This maneuver proved to be most effective; in about 30 minutes, the German fighters had destroyed some 20 bombers. When the bombers passed north of Brunswick, the attacks from this first line of defense ceased, but when the 1st division reached the Berlin area, the air battle began again and continued until the bombers left the area. 20

Some of the fighter escorts were subjected to attack as the formations crossed into Germany, but the majority of the Geschwader concentrated their strikes against the low bomber groups. Some of the formations were
under fire for as long as two hours and 45 minutes, and all types of tactics were tried by the Germans. Rocket attacks and air-to-air bombing were attempted, and a new type of projectile (believed to be a fused 20-mm. incendiary shell) which burst with a sparkling effect and invariably set fire to aircraft which it hit was seen for the first time.\textsuperscript{21} Antiaircraft fire over the Berlin area was intense and accurate. Weather conditions at the target were unfavorable and the bombing was generally regarded as poor. A total of 67 bombers and 11 fighters was the cost which the AAF had to pay; however, losses were not all on one side. The bombers claimed 93-64-55 German fighters, and the escort fighters listed 22-2-32 as destroyed, probably destroyed, and damaged.\textsuperscript{22}

On the 7th, the Fifteenth returned to the airfields in the Rome area and struck Fabbrica di Roma, Civitica, and two fields at Viterbo. Only at Fabbrica di Roma and the main Viterbo field was assault possible, bursts showing on both these landing grounds.\textsuperscript{23} Clearing weather over northern Europe permitted the Eighth to make another attempt at the Berlin area on the 8th, and 620 bombers dropped 949.5 tons on the major ball-bearing plant. The excellent visibility permitted accurate bombing, and General Spaatz believed that the target had been completely destroyed.\textsuperscript{24} Once again the Luftwaffe put up a sturdy defense as the loss of 37 to 92 and 17 fighters indicated. Total bomber and fighter claims were to 123-26-41.\textsuperscript{25}

After this there was a pause in the Eighth’s raiding operations. Several missions were directed against rocket-bomb installations in the Pas de Calais sector and there were the usual weather holidays. On
the 15th, 244 bombers were dispatched to bomb Frankfurt, a city rich in aircraft targets. Unfortunately, when the planes reached their objective, they found it covered by 10/10 cloud and although 745 tons were dropped by means of blind-bombing equipment, the results were not observed.26 A dive-bombing mission accompanied by a low-level fighter sweep was carried out by 160 Mustangs on the 17th. In the following day when a heavy force of bombers attempted to get through to strike airbases and aircraft factories in south central Germany, the overcast again protected the primaries. The cities of Munich and Friedrichshafen, and five smaller targets of opportunity, were bombed instead. As so often had been when the primaries were overcast and targets of opportunity were bombed, arrangements with the fighter escort were thoroughly upset. Many bombers missed the rendezvous with the fighters altogether and were, consequently, exceedingly vulnerable to the attacks of the F.G. Forty-three heavy bombers were lost, of which four were destroyed in mid-air collisions and one was struck by bombs from a friendly craft above it. The returning bombers made claims of 45-10-17; 15 fighters were lost and escort claims were 40-5-9.27

While the Eighth was so engaged in the attacks over southern Germany, the Fifteenth was carrying out one of the most brilliantly planned aerial maneuvers of the European war. The target was a group of airfields and landing grounds located in the area surrounding Ulm at the northern tip of the Drinatic. This "pocket of enemy air power," as a tactical mission report described it,28 operated directly against the most convenient routes from Italy to targets in Austria and southern
Germany, and was a constant source of irritation to the Fifteenth Air Force. Recognizing the importance of these bases, early in 1944 the Luftwaffe began to concentrate considerable strength on them. The photo reconnaissance of 23 January showed approximately 170 fighters present in the area. The highly successful raids of 30 January reduced this number to about 70 undamaged planes, but because of the important part these airfields played in the defense of southern Germany, the destroyed and damaged planes were replaced and fighter strength was gradually built up again. Recent photographs of the fighter airfields at Iullo, Lavarino, Rivaio, Cesago, Corizia, and Ulino showed a total of 235 enemy fighters, and it was known that the Villarotta landing ground was the main base for the German bombers harassing Allied shipping at and around the Malee-Bettano area.

To neutralize these fields and destroy the maximum number of enemy planes, a series of carefully planned and timed operations was worked out, and was mounted on the morning of 13 March. The first phase occurred when 95 1-30s took off at 0720 hours, rendezvoused at 1,000 feet over San Severo, and then flew over the Adriatic at approximately 75 feet above the water to avoid radar detection. As they neared the coast, they rose to 5,000 feet and separated to perform their parts in the developing action. One group circled over Treviso, strafed trains and airfields, made a short patrol north to the mountains, and then flew to Venice to continue its nuisance activities.

When this photo reconnaissance was studied, the Villarotta field actually showed a drop from 95 to 23 aircraft present. However, at this time a raid was going on in the Vienna area and it was assumed that some of the Villarotta planes were taking part in the battle. This presumably temporary decrease in prejudice is not allowed for in the figure of 235 aircraft cited above.
carried out a fighter-bomber raid force at 0730 in the Udine/Villarba area and succeeded in holding most of the enemy fighters on the ground.

Meanwhile, 113 B-17's had been flying up the Yugoslav coast making a feint toward southern Germany and flushing up the fighters based in the Klagenfurt and Graz areas. When the bombers reached a point north-east of Trieste, instead of continuing into southern Germany, they turned sharply west, attacking the Klagenfurt/Graz airfields with their 32 shortly afterwards at 1013 hours the dropped 20-lb. fragmentation bombs on the Villarba and Udine bombing grounds.33 As the bombing ceased, the Klagenfurt/Graz fighters, who had considerably extended themselves, had to land to refuel; however, because of the damage at the fields just bombed, they had to continue at other nearby bases.

The stage was thus set for the final phase. While the enemy aircraft normally based in the area were concentrated on the ground together with the fighters from the Klagenfurt and Graz areas, three task forces of 72, 67, and 121 Liberators swept in to blast the fields at Gorizia, Ljubljana, and Livorno between 1059 and 1111 hours. The effect was devastating: a total of 32,370 20-lb. fragmentation bombs were dropped and only 2 enemy aircraft were able to get off the ground to intercept the B-17 forces.34 This raid was a heavy blow to enemy air power in northern Italy. In the official report, the tasks forces were credited with destroying or damaging 50 aircraft on the ground. Fighter claims for the aerial battle were 23-7-9, and the fighters claimed 33-3-3. Losses were extremely light; out of the 457 bombers and 14 fighters that went out, 7 and 9, respectively, failed to return.35

Next day the Fifteenth launched a follow-up blow at Klagenfurt and Graz. The Klagenfurt airfields was hit by 23, heavy bombers that
urged 56,450 tons of fuel into oil to be used in the afternoon.

This made it difficult to assess the damage, but hits were seen on

air-raid shelters, administration buildings, dispersed areas, and the landing

fields. Thirty-two fighters and 7 bomber-transporters were seen on the

fields; 13 of the former and 3 of the latter were claimed destroyed.

Between 40 and 50 enemy aircraft attacked the bases in waves and shot
down 22 sorters, while 5 were lost to flak: and another 1 collided.19

Crusaders attacked by 76 aircraft dropping 100,2 tons of 500-lb. and 3,1
tons of 100-lb. bombs. Photos showed the bombs falling in the southwest
part of the city. Fifteen enemy planes were destroyed and 12

Liberators were lost.20 On the same day 71, 1-17's and 1-51's of the

8th Air Force made a combination dive-bomber attack and fighter

sweep on the Almeida (bath) airfields and surrounding country. Two

hits were reported on the southwest portion of the field and near ammunition
stores, but in general the bomber was only fair. There was no

concentration or claims or losses.21

Air operations were delayed for 23 hours on the 9th until 4:30 v. last

day after 2,700 were shot out of action in the night and

central areas. However, cloud conditions interfered with the

aircraft's ability to see their targets for 15 minutes, and by 3 planes were able to be turned into the south and

primaries. 1,755 were shot out of action on 2nd night, however,

and 15,130, 13,700, and 3,700 additional targets were

achieved in the time caused considerable confusion as the low

planes were to be used in the 15 minutes after the 1,730 minutes attack of the 2nd night for which were

here to 23 minutes each. This naturally made it difficult for the

aircraft to attack the

[Handwritten notes on the page]
assists to locate the target formation on the aiming force. The results of the bombing were difficult to estimate. The order/purpose required received a good night attack and around its first position, on the 16th. Hence, the target may have been hit, but cloud cover prevented successful photo reconnaissance. No attacks were effective, and 21 sorties failed to return. 

either. The interference led the attack of the first force. A force of 200 -15s was sent to the ballista and staff of the material which was to strike the airfield in northern Carnarvon. The cloud covered the situation for the rest of the day, in which the interception of 35 sorties attacked from the north with 18.5 tons of ordnance. The results were unsatisfactory. At times the airfield was a target to 60.7 tons were sunk in it. At times, airfields with little apparent damage were overflown. Despite this, no opposition was observed. 

Intensive counter-attack was carried out on the 27th. Airfields covered central areas but in the west the weather was clear. Hence, a large force of 707 bombers sent out to attack, and five airfields radior returned the north and northwest areas. The results were significant and were as follows:

- 14 airfield
- 3 fighter school
- 3 fighter field
- 1. rocket and anti-aircraft base
- 1 anti-aircraft base
- 1 railway and fighter operations base
All bombs were dropped visually and 950 tons were dropped. With the exception of the Tours repair depot, all the objectives were well covered and the bomber was considered good. The next day a force of 373 B-17's and 77 B-24's were sent to attack airfields in France again.

Because of deteriorating weather conditions, the Liberators were all recalled before reaching the targets; however, the Fortresses pressed on and dropped 920.5 tons of bombs. The results at Chartres and Oise were good, and only 87 B-17's and B-24's were lost. The accompanying fighters claimed 30-1-33 for aircraft attacked and destroyed. Losses were light; two bombers and three Liberators.

These operations virtually ended the counter-air operations for March both in Belgium and in Italy. In the whole, it was a month marked by much greater activity against airfields than against the basic factories of the aircraft industry. In the case of the Eighth Air Force, weather prevented a heavier effort against the industry, for although it was still the weather one constant, the Eighth dropped a total of 21,340 tons during the month in 8,570 effective sorties for losses of 4.1 per cent of the attacking forces. A very large number of German fighters were claimed destroyed during the month, the total being no less than 934 planes; 303 of this number were credited to the bombers.

The Fifteenth Air Force was equally handicapped by some of the worst weather observed in years, but, unlike the Eighth, it was also...
involved in occasional support of ground battle. A certain amount of the air effort were spent on the aerial operations, on the ground battle, and in attacks on rail communications in the peninsula.

Theoretically, SISL I remained the top priority for the Fifteenth, but for the reasons listed above, little could be done against the aircraft factories located across the Alps in Austria and southern Germany. Instead, counter-air operations took the form of attacks against airfields. This not only satisfied General Arnold's instructions to hit the Luftwaffe in the air and on the ground, but it also came by art to the ground battle. A total of 1,731 tons was dropped on these targets during the month was compared with 417 tons dropped on similar objectives in February. However, the March tonnage on aircraft and communications factories was a mere 279 tons. Losses were considerably less than in the previous month, being only 2 per cent of the 4,390 effective sorties. Joint bomber and fighter claims of destroyed enemy aircraft came to 210.

Furthermore, the many claims on the Fifteenth Air Force sometimes proved false reports in the high places. Something like this took place toward the end of March. General Air Harry H. Hap Arnold, the theater commander, had ordered the strategic force to proceed to aircraft marshalling yards at Bucharest, Iaesti, and other Balkan targets, although Air Marshal Air Charles Portal had decided that Iaesti was not to be bombed. General Spaatz requested General Arnold to let the matter stand with the higher authorities, stating that the total tonnage on all targets for the month was 14,876.
it seems to me that there were too many people giving orders to the Fifteenth, and that it could not accept responsibility for the control of the strategic force until the matter was clarified.69

This also proved to be a situation which involved not only the Fifteenth but also the Sixteenth and Seventeenth Air Corps under the orders of the Twelfth. It was his misunderstanding that several Sixteenth Air Corps control centers had been given orders to create a combined Sixth Air Force under the direction of the Sixth Air Force Commander, with the Fifteenth Air Force not being involved.70 It was true that the command was still located in the Sixteenth Air Force area against the apparent desire of the British to have the theater commander's right to direct strategic forces against political objectives—for example, the desire to bomb the oil refineries in the Balkans—never being realized.71

In his reply, Portal stated that he respected the supply arrangements made and did not wish to make them harder, but the British believed that a very favorable situation existed in the Balkans and wished to exploit it. He urged that the theater commander in the Mediterranean be given authority to order the Fifteenth to attack certain Balkan targets.72 The higher commanders were not so easily influenced by their decisions but in favor of the British objectives.73 Portal continued to insist, however, that Fifteenth Air Force should be directed only with regard to its own needs and priorities, that it was willing to be a part of the operations in the area, but it really did not wish to have a mission in the area. He concluded by requesting that all divisions and the air effort are carefully aligned by you.74

[Signature]
fellowship the occasion of J5, a new order of priority for the
fifteenth air force was set up. First place was given to the require-
ments of the battle of Italy, second went to Romania, and third
was given to targets in southeastern Europe. It was also stated that
then the occasion warranted general action. In general, targets could
devote time to established priorities to attack other targets of
most political and military importance. The ban on attacking targets
in Romania was abolished.55

After these basic policies had been formulated, detailed opera-
tional instructions were received at Fifteenth Air Force headquarters
on 21 March. The major targets were listed in the following order:56

1. Steyr air-vehicle factory and Hill-Towers plant, Steyr,
    Austria
2. Religious unit of the "C-109" complex, Stiener Forest
3. Inter Cincinnati camp
4. Voelmi aircraft and armory
5. C-109 aircraft, plants, plants, plants, Hungary, and the
    Consolidated Aircraft factories and armories
6. Armament and machine works, Gyor, Hungary
7. Heinkel aircraft factory, Miskolc, Hungary
8. Heinkel aircraft factory, Miskolc, Hungary
9. Consolidated Aircraft factories and field near which
10. Consolidated aircraft, Austria

The Steyr and Hill-Towers plant, although in second place, was believed to
be the largest remaining unit of the Stiener Forest. The Heinkel aircraft
complex, and was probably producing wings and other "C-109" components.

The Heinkel complex was reviving and was presumably assembling
at least 75 "C-109s" per month. It was linked with the Voelmi plant.

The Fifteenth Air Force was supposed to be assembling

The Heinkel aircraft factory appears in third place in a list telephoned
to the Fifteenth Air Force on 23 March. This discrepancy cannot be
explained.
both Me-210's and -410's. The facilities at Ingolstadt and Everstafenden were involved in the production of the Me-210, while the Schwabach plant was supposed to be building new jets and possibly assembling the Me-210 night fighter. 37

In case weather prevented attacks on the primary targets, secondaries were listed as follows: 58

1. Macchi aircraft factory at Turin, Italy
2. FIAT aircraft factory and airfield at Turin
3. I.reda works at the Foggia/ Foggia airfield
4. The extension of the Messerschmitt complex at Ingolstadt, Austria, and
5. Its extension at Lesan, Yugoslavia, where the Henschel and I. reda factory was producing and repairing Me-109's
6. Muller ball-bearing factory at Nuremberg

In 3 April a few modifications were made in both lists. The Fiat Yoshia factory was lowered to third place in the primaries, and in the secondaries, the Fiat aircraft plant became first priority, I. ragenfurt was put in third rank, and I. reda was dropped. 59

The emphasis on relatively new targets in these directives is indicative of the progress of dispersal within the German aircraft industry. Since many of these plants were in central or southeastern Europe, they affected the operational policies of the Fifteenth more than those of the Eighth. Some new plants and some expanded old ones were bombed, but it was not considered possible to locate and destroy all of them. Rather, it was decided to pound the ball-bearing industry hard, and try to concentrate on a small number of large aero-engine component and assembly plants. Thus, plus the basic strategy of attacking finished enemy planes on the ground wherever they could be found, was considered the best way to hold down the Luftwaffe if it could not be totally destroyed. 60
Both the Eighth and the Fifteenth were faced with priority conflicts during the spring of 1944. In England there was a tendency for the strategic effort to swing to the bombardment of tactical targets in preparation for O.A.S./D, and in Italy a great deal of emphasis was placed on the destruction of rail facilities, as a result of the insistence of Air Marshal Tedder. Nonetheless, the pressure on the C.F. was kept up as much as possible. 61

In keeping with the new directive, the Fifteenth launched an attack on the Steyr ball-bearing plant, the number one priority, on 2 April. The German ball-bearing industry had been a frequent target for attacks by both strategic air forces. After the heavy raids on Schweinfurt, the Steyr-Waffen-alkalzwerk had become one of the most important ball-bearing plants in the Reich. Once an aero-engine works, it was now known to be producing bearings and ball-bearing assemblies for the German government. Although this plant had been heavily damaged by the Fifteenth in previous raids, the latest reconnaissance showed definite signs of activity. A recent photo coverage of the Steyr/Schuenstaudt complex revealed that its capacity for aircraft assembly was being increased and it was thought that the Steyr plant might, in some way, be connected with this. 62 For this reason it was decided to strike it in force.

Just at noon on the 2d, 127 B-17's and 137 B-24's, escorted by Lightnings and Thunderbolts on penetration and 78 Lightnings for target cover and withdrawal, roared over the Steyr plant at altitudes from 19,000 to 25,000 feet. Nearly 700 tons of bombs were dropped with great success. In two ball-bearing and two care-manufacturing
buildings the damage was practically total, and in the packing and dispatching building, 50 per cent of the roofing collapsed. The testing and assembly building received one direct hit and the receiving depot got two direct hits and two near misses. At the same time, a force of 1.8 E-21s bombed the Steyr airfield with 333.30 tons but failed to do any damage to the main structures, and a freshman force of 20 E-21s attacked the Nordol airbase as a secondary target.63

The attack on the Steyr plant produced a sharp reaction from the Luftwaffe. The bomber crews estimated that they were attacked by 250 to 300 enemy planes, and believed that they had shot down 24. The majority of the intercepting fighters were from the Vienna-Graz-Klagenfurt area, with the exception of 60 or 70 aircraft from fields east of Salzburg and a few from Munich.64 As a result of this mission, the Steyr ball-bearing plant was suspended from the priorities list; pending more definite information, the undamaged portions of the Steyr-Daimler-Puch factory were classified as "a secondary target of low priority."65

The next three operations of the Fifteenth Against Feldblitz targets were on a smaller scale. On 3 April a force of 112 Fortresses bombed the Budapest/Tokol aircraft factory with 331.75 tons. Although enemy attacks were aggressive, only four bombers failed to return. Strike photos showed 350 craters within the precincts of the factory, but only two buildings received serious damage. On the night of 3-4 April, 7 Liberators and 70 'Ellington's dropped high explosives on secondary targets on the 'Manfred' axis works at Budapest. A good concentration of bombing was reported with two large explosions and...
many fires. In the 6th, a force of 97 bombers was sent to the Zygreb
airbase, but owing to very overcast, only 19 Liberators were able
to attack. No bombing results could be observed.

After an absence of 10 days, the Eighth Air Force began a period of
intense Luftwaffe activity by staging an operation against several
targets in northwest Germany on the 8th. Nine combat wings were committed;
314 1-Ls, were to attack five Luftwaffe installations and 330 D-2.51s
were to bomb two aircraft factories in Brunswick. Although the Juits
encountered no opposition, the Liberators which spearheaded the attack
ran into a considerable air battle. At first, nothing happened as the
bombers passed Linz, then Jumon, Steinhuder Lake, Hanover, and
even Brunswick without seeing any sign of the enemy. About 40 miles
northeast of Brunswick near Lüneburg, the formations ran into a con-
centration of 150 enemy fighters, and a fierce combat resulted in which
the 2nd Division lost 30 planes, although it appears that the American
fighter escorts outnumbered the attacking planes. The heavy bomber
losses can be partly explained by a navigational error made by one of
the combat wings of the 2nd Division. This wing turned south too soon
and flew an "inside course" to Brunswick which placed it some 60 miles
ahead of the scheduled escort pattern. In the words of an official
report, this wing "suffered the usual consequences of such a naviga-
tional error. The enemy exploited the situation with his usual alacrity
and effectiveness."

The bombing of the IG plant in the Hildesheim suburb of Brunswick
produced excellent results. The 362 tons of bombs were well distributed
and every building in the installation was hit, owing to navigational
difficulties, many of the B-17's were unable to reach their assigned objectives and many targets of opportunity had to be sought. As a result, the following C.G. airfields were attacked with generally good results: Langenhagen (142 tons), Kesslingen (152.5 tons), Oldenburg (147 tons), Nespea (39.6 tons), Twente Inschade (41.6 tons), Twickenbruck (154.6 tons), Hamborf (36 tons), Schwa (112.5 tons), and Rheina (41 tons). The VIII Bomber Command lost 34 planes in this operation and 22 fighters were missing also. Total bomber and fighter claims against the enemy were 148-25-28.

Another extensive operation was planned for the next day, 9 April. This was to be a very deep penetration of the Reich to attack Focke-wulf factories in north central Germany and Poland. A total of 542 bombers were airborne, but high clouds over England hindered the formation assembly and only 402 planes actually reached the targets. The German opposition was vigorous in some areas, but in general it was sporadic and confused. The enemy seemed uncertain both as to the destination and the withdrawal route of the bombers, and the heaviest attacks finally fell on a portion of the returning bombers who chose to fly a course farther south than originally planned. Had they kept to the briefed route, they would have probably missed the German interceptors who were nearly out of fuel. By returning some 90 miles farther south than intended, they flew into a concentration of some 60 single- and twin-engine fighters, and some bombers were lost.

The Focke-wulf plant at Marienburg was well bombed with 217.5 tons dropped from medium altitude. Various assembly shops received direct hits, and 25 per cent of one sub-assembly building was destroyed.
Office buildings were damaged and fires started in the barracks. At
Cycline-Hohnel, the bombing was done by a relatively small force and
was considered fair to good. Arnsamunde and its aircraft installations
received severe injuries; a heavy concentration landed on the north end
of the workshop area and there was another good pattern on the marshalling
yards and the warehouse area. A small force attacked the P.5 air-
frame factory at Rosen scoring many hits while another small formation
attacked Rostock with poor results. At Tutow 106 Liberators dropped
270.3 tons with fair results. There was a concentration on the air-
craft installations between the two airfields and photos showed many
fires burning. 74 On the various phases of this operation, a total of
31 bombers and 10 fighters were lost and combined fighter and bomber
claims came to 62-15-30. 75

On 10 April another blow was delivered against the dwindling
reserve strength of the Luftwaffe. A force of 400 B-17's and 243 B-24's
was dispatched to attack 62 air bases and centers of production and
repair in Belgium and France. In coordination with the main operation,
one combat wing of Liberators attacked a military installation in the
R. de Lais area while two groups of B-24's attacked two French airbases.
Neither interfered with attacks on four pri-
marys, but all other objectives were hit. The attacks on the aircarft
repair centers at Brussels and Eupen were particularly successful.
Airbases and fields were bombed at Worps, Cleve, Lille, Gembloux,
Beaumont-sur-Loire, Marnes/Blanc, Blaust/Juvenon, Irlens/Bray, and
Hansturtant. 76 The enemy opposition was very weak, suggesting
that the Luftwaffe was not prepared to commit itself in force to the
defense of northwest Europe.
The favorable weather conditions which permitted these operations may have influenced General Spaatz to schedule a modified form of operation ...[cut]... which had been so successfully carried out during 20-25 February. At any rate, on 11 April he signaled ether via the Redline communication system that the weather looked very favorable for combined operations and he wished the Fifteenth to attack Neuer Feustadt, Rischwand, and End Voelen while the Eighth attacked Schweinfurt, Tutow, Orshaau, Leipzig, and Halle. However, for reasons which are not very clear, the plan was abandoned after several postponements.

Meanwhile, the Eighth continued its large-scale assault on the aircraft industry deep within the Reich. The emphasis continued to be placed on the Zeke-kill plants, in comparison with earlier efforts which had been directed largely against the Messerschmitt complexes. On the 11th, a big mission was planned against six A-190 and Ju-88 assembly plants far in the interior of Germany. The tactics were strongly reminiscent of the very successful operation of 20 February. The main force composed of the 3d Division was to proceed along the well-traveled Gotha-Zee-Darmstadt-Munster route to Eickeslotten and Lemburg, and was to be followed by the 1st Division en route to Juttaus and Bremen. At the same time, an unescorted diversionary force made up of the 3d Division was to proceed over the North Sea to Ronen.

Unfortunately, the Germans seemed to have solved this particular form of attack. The exact force's course was accurately predicted from the outset and it was intercepted over the Gable by a force of twin- and single-engine fighters which flew directly from the Berlin
area. Heavy attacks followed, and as the weather was deteriorating, the attack on Lauenburg was abandoned and instead, were boiled instead. Here, in the midst of the storm, and as a result of its lack of lighter protection, the 21st division lost 33 bombers. 79

While the 21st and 1st divisions, to list them in their order of flight, were attacked, the largest, and penetrated the air over Lauenburg before they were attacked. Then about 150 enemy aircraft concentrated in the Lauenburg area, launched many attacks on the American formations, the 1st division being severely harassed and sustaining considerable losses. 80

At Lauenburg, the 7-199 and 1-18 assembly factor, received 2,980 tons of C and fragmentation, as well as 97.2 tons of incendiaries. Three large bursts covered the main assembly shop and there were isolated hits on offices, hangars, and hangars. The 7-199 assembly at Lauenburg was visited by 121 B-24's dropping explosives and incendiaries with good results. 81

A direct hit on the factory for the first time by the 16th air force. The target area were covered by six more concentrations and there were direct hits on several buildings. A total of 70 B-17's were used in these attacks. 82

Lauenburg, too, was hit by the 27th air force, with direct hits on the factory. 83

Lauenburg, too, was hit by the 27th air force, with direct hits on the factory.
problems. 

As Generalissimo, Assistant Chief of Staff for 1-2, stated: "Interdicted [enemy] air resistance in defense of vital targets is still being encountered." He further advised the division for the 13th, but the skies cleared the following day, and, in our opinion, was possible. The targets were the Mani-la-ja-i fighter center at Meuse, Schiekild, and the ball-bearing factory at Schacht, which had been partially re-armed since the last attacks by the VIII Bomber Command. The weather was clear and the operation was flown essentially as planned, with the 1st Division leading; two others, until the morale of the fighter force was reached, then the 1st continued on to Schacht and the other two turned south to a target and the other objectives. The 1st Division received all out the entire enemy attack.

The German fighters assembled in the Dovincourt-Buiss area, well to the south of the formations and out of range of any American escorts, roving ahead of the bombers. At assembly they proceeded north, receiving reinforcements from bases in Belgium and the southern Netherlands. At this time the enemy fighters were over 100 strong, and with this formidable concentration they engaged the bombers of the 1st Division just north of Arlon. At this time, the entire fighter escort of the division consisted of 48 -57's. As this fierce combat broke up, the formations one into the Frankurt area, where another 100 single-engine fighters were encircling some of the fighters had flown 20,000 miles from remote bases to take part in the engagement, and when the battle was joined near Arlon, they threw the selves enthusiastically into the the melee. The small force of -57's was inadequate to defend the formations and, in spite of their best efforts, all center.
went down at this point before the enemy fighter assaults. By this time the target area was reached and the bombs were dropped; shortly afterwards a force of Me 410s which had been on cloud to clear 20 fighters from the Jersheim area rejoined the Thunderbolts, and the enemy fighters retired. From this point back to Land, the 1st Division was unopposed. For were the other two task forces seriously engaged by the enemy. Either he had concentrated all his efforts on the 1st Division, or a raid by the Fifteenth in the Budapest area had driven the luftwaffe away from southern Germany. 85

The bombing was, on the whole, successful. Schweinfurt was struck by 3,83 tons which covered most of the luftwaffe plant. Photos showed that the entire west part of Werk I was severely damaged. At Werk II, three direct hits on a large assembly and machine shop were seen, although smoke and debris made observation difficult. 86 The Lechfeld airbase, believed to be a testing field for He-410's and experimental aircraft of the luftwaffe plant at Augsburg, received 245.0 tons of 8- and 16-in, with results that were believed to be good. Oblt. von Bohlen, an important factory and airfield for the Do-217, and possibly for the He-410, was hit by 60 Liberators with fair results. The heaviest bomb load fell on the aircraft factory at Augsburg where 207 B-17's dropped 1,944 tons. Hits were seen on an assembly machine shop, a power house, and a flight hangar. There were incendiary strikes on two round hangars and machine and press shops. The great volume of smoke made further assessment impossible. The cost of this operation was 33 bombers. Total claims against the enemy were 124-20-59. 87

While the Eighth was carrying out these intensive actions against
the German aircraft industry, farther south the Fifteenth was making its contribution to the same end. On 9 April a modification of Operation I Instruction No. 18 was sent to the Fifteenth. This new order suspended the Duna Municypaif plant near Budapest and the Stuttgart ball-bearing factory; some changes were also made in the secondary targets by placing the Turin Sertifilia factory at the head of the list and readjusting some of the low-ranking objectives. 23

The destruction of lesserschnitt production still remained a prime duty of the Fifteenth, and on 12 April missions were scheduled against important centers that were still presumed to be in production. The important Brunswick factory was attacked by 172 B-17's dropping 423 tons of 4G bombs and 42.4 tons of incendiaries. In spite of intense flak, direct hits were made on three component shops, and other installations suffered damage. One bomber was shot down by antiaircraft. Unfortunately, a certain percentage of the bombs fell in the residential area of Vienna. Another task force of 134 B-24's was sent to Linzer Neustadt where a scattered but heavy concentration was achieved over about half the target area. There were direct hits on machine and locomotive shops as well as on some of the workshops. Between 40 and 50 enemy planes made attacks from all angles on this task force. The Bad Yoslan aircraft assembly plant was the target for 140 bombers of the 30th wing. A very heavy concentration inflicted severe damage on hangars and barracks near the landing field. The field itself was well covered, and of the large number of planes present when the attack occurred, it was estimated in later evaluations that 24 were destroyed, 7 probably destroyed, and 2 damaged. Six bombers were lost.
at this target. The final phase of the operation occurred when 107 Liberators dispatched without escort bombed the Z-geb airdrome and marshalling yards. The bombing was good and only one bomber was lost. 39

The following day was a big one in the history of the Fifteenth's operations. Attacks were planned against a series of important FB/F-111 targets. High on the priority list was the aircraft production complex at Gyor, Hungary. This plant was engaged in producing the Pe-107, and it was believed that no less than 40 per month were coming from the assembly factory located at the Gyor airfield. The destruction of this plant would reduce to 75 the entire monthly production of single-engine fighters being produced within the range of the Fifteenth Air Force. 40 In addition to this important target, there were others that needed attention. The Dan components plant at Budapest had been seriously damaged by previous attacks, but it was believed that further demolition was necessary. Another objective was the Budapest/Iskol airfield which was thought to be assembling the components from the Dan plant. At the Budapest/Veses airfield extensive modification and repair facilities were available to the G-2. In the opinion of the Fifteenth's bombing experts, "the destruction of the Dan complex and the Veses aerot should reduce by two-thirds the total current production of 'o-210's and 'o-410's of the enemy." 41

To destroy these important sources of G-2 production and repair, the Fifteenth mounted one of its largest missions. On 13 April some 811 fighters and bombers were airborne in a three-phase operation. As Z for factory and airfield were attacked by 103 B-17s Fortresses...
that dropped 355.74 tons with excellent results. Practically all installa-
tions were hit, and the landing field was well post-holed. Nine en-
ey aircraft were claimed as destroyed on the ground. The Gyor Land-
force was aggressively attacked by 20 to 30 German fighters that
approached the rear formations firing rockets up to within 100 yards
as they came. They then broke below the bombers and reformed to
attack the second wave. The Budapest/Tokol airstrip was bombed by
121 P-51's that wrought considerable damage to installations and played
havoc with the large number of aircraft parked on the landing ground.
The main buildings were hit by 160-lb. bombs which formed a heavy con-
centration in the southeast part of the field. Of the 190 aircraft
present, 69 were believed damaged or destroyed. The Budapest/Tokol
airstrip was similarly bombed with high explosives and fragmentation
bombs by 124 aircraft. Installations were well covered and about 64
planes on the field were believed destroyed. The Danu regu-lar-year
aircraft factory near Budapest was bombed by 107 Liberators; the photos
showed a good distribution of cases over the factory area, and direct
hits on four assembly buildings.92

The German fighters put up a good defense of these important
targets. The Luftwaffe called in all types of attack planes, and
He-109's, -210's, -110's, F-190's, and Ju-88's were sighted. All the forma-
tions ran into opposition, but the last unit over the Budapest
area, the 304th Wing, had the most trouble. Twin-engine planes stayed
cut of range of the bombers' guns and fired rockets into the formations
while single-engine fighters concentrated on stragglers, cripples, and
separated units.93 Eighteen bombers and three fighters were lost in
the different phases of the operation. The destruction among enemy planes was heavy. Conservatively, it was estimated that at least 70 planes had been destroyed on the ground, and fighter and bomber air claims were 43-13-15.\footnote{94}

For the next few days the eleventh continued its attacks on airfields and similar installations. In the loth, medium-sized forces struck the airfields at Ivanovo-Senvis and Belgrade/Lesman, inflicting some damage but leaving the fields still usable.\footnote{95} In the same day, a larger force of 103 Fortresses attacked the Belgrade/Borczarski aircraft factory as a secondary target when the primary was found covered by cloud. The main concentration did not fall on the target but landed on the neighboring Lesman airfield; there was one direct hit on the southeast part of the factory.\footnote{96} The same Belgrade targets were hit again on the 17th. The Borczarski factory was hit by a small force with some success. Weather almost prevented the attack on the Lesman airfield, but 24 bombers managed to get through and drop 7,925 fragmentation bombs which destroyed 4 airplanes and set fire to some hangars. A raid on the Nisus aircraft factory showed no hits in the target area. Unfortunately, the bombs fell in the residential part of Belgrade.\footnote{97} This phase of counter-air operations ended on the following day when fighter sweeps were scheduled for the Uaine and Belgrade airfields. Bad weather held some of the units back, but 12 1-36s managed to strafe Uaine and 3 attacked Belgrade.\footnote{98}

The eleventh had been held up by poor flying weather, and by a mission, but on April the bomber force was scheduled an operation against targets in the Berlin area. No enemy opposition
occurred during the penetration or withdrawal, but a short sharp fight occurred at the target area. Crossing in the air place with more discrimination, the enemy suddenly hurled 100 single-engine fighters at a formation whose units had been separated by weather conditions and which were too split up to receive adequate fighter protection.

In the words of an official report, "this was the advantage for which the enemy had been waiting. We saw and exploited it with split-second timing to the tune of at least 10 B-17's. Our fighters did not even see it happen." 99

The radio component plant at Athalassos was bombed with very good results by 121 B-24's. Usually satisfactory were the results at the Luskernburg airfields. The heavy pattern fell across the target area with numerous hits on hangars, refueling points, a compass-swinging base, and a machine-gun range. The aim concentration at Cranenburg/Amahof airfields fell west of the field, cut some hits were scored on the Heinkel assembly plant, and 8 He-177's were believed destroyed or damaged.

At the Cranenburg/Schandorf airfield 143 B-17's dropped 101 tons of GP bombs and 173 tons of incendiaries, but no large fires were started and the main installations were not seriously damaged.

The radio plant at Cranenburg was raided by a small force with undisclosed results, and 13 Forts dropped bombs on the Werdhagen airbase, scoring hits on three medium-sized hangars. The forces involved in the 13 April missions totaled 501 B-17's and 275 B-24's. Total losses came to 19 planes and all 1 were lost, being only 14-4-7. 100

Airfields and B-17's 1 were on the main targets for the next day's operations (15 April). A large force, 59 aircraft, was sent
against the targets, which are usually defended by the a.g. The rsd/attacker is 50-6000 feet when the target is successfully hit by 52 1-17's and three times more when the 10,000 feet hit. The rsd/attacker is 1 of the 1-17 group, which was operated by the. All the important installations received hits in one or more buildings and set on fire. Most of the targets were located 1 of the 1-17's. The tank was then set on fire. The attack was direct and the surviving tanks were destroyed by the fire of the 1-17's and the 100mm howitzers. There were also a number of direct hits on vehicles.

The targets were also located near the airfield. In total, the attacking tank killed 17 of the enemy. The enemy, however, received 17 direct hits on the airfield. The 1st, 2nd, 3rd, and 4th tanks were lost among the 100mm howitzers.

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the industrial war potentials of other countries. As for the summer schedule
problems referred to recently by the senior German officials, those were the priorities for
the summer, fall, and winter. The higher priority usually replaced the remainder because of the continued issuance of
large numbers of 170s on the field. 103

The new target priorities sent out the target list are as follows: 104

1. Berlin-Leutrum, Potsdam
2. Hanover
3. Krefeld
4. Schweidnitz
5. Fiume/Thessaloniki
6. Karlsbad
7. Wrangell

Nisshoku, Ivar, and Spring said that "targets were removed from the first
priority because of the severe damage inflicted on them. The secondary
priority included the following: 105

1. Erlangen
2. Harburg
3. Kirchen (near Munich)
4. Adlershof
5. Stettin/Poland

The fillers were to their prevented action against the first and second
priorities were the minor branches of the senior list. It concerned the
factory at Leutrum and the Berlin-Thessaloniki plant at Berchtesgaden.
Other fillers were the re-arm factor, the single-production aircraft at
Krefeld, the German components factory at Thessaloniki, the diesel
aircraft factory at Hanover (Greese), and the factory at Schmach
stronghold. 106 Special point was made of the importance of airfields,
especially those connected with re-arm and related functions. In view
of the certain number of textile plants were being converted to the Germans
to aircraft production.

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of the declining state of the Luftwaffe such installations were much more important as targets than before. 107

To translate the new instructions into action, the Seventh
Bomber
Force launched a large operation against the airfields and aircraft
factories at Sud Iwakuni, Yokosuka, and Nieder Loosur on 23 April;
the attack on the former east of Tord airfield was also scheduled.
These objectives were among the most important within the range
of the Fifteenth Air Force. Yokosuka was especially vital. As has
been pointed out, it was the center of important jet developments,
and since a plan for using the He-177 jet fighter in Japan had fallen
through, Yokosuka was now the sole producer of this twin-engine
fighter-bomber. Both Iwakuni and the Nieder Loosur Ford airfield
houses large numbers of newly assembled He-107 planes and offered an
excellent target for fragmentation bombs. 108

The attack was mounted approximately as planned. A total of 956
aircraft were airborne and dropped 1,292.5 tons of bombs. In the
aerial battle that took place, the bombers were engaged by 175 to 200
enemy planes. Three fighters and 13 bombers were lost, and claims
of 51 to 32 were made by the American forces. 109 The Nieder Loosur
factory was to have been attacked by 322 B-17s, but one aborted and
the only 171 reached the target. The bombing was very successful. Severe
damage was inflicted on a large machine shop and the main shop showed
fresh roof damage. The east extension of the factory received two
direct hits in the center and probably received considerable blast
damage. The assembly shop was probably struck directly, for the roof
contained large holes. 110
At Schönstatt, direct hits were scored by 140 bombers on the main assembly shop, a workshop, two flight hangars, and some barracks.

Red Vošlau received a heavy load of 261.75 tons of 500-lb. bombs and 12,550 x 20-lb. fragmentation bombs. Later photos show the airframe and all principal installations heavily hit, and General Thirring characterized the results as "superb." The most badly damaged buildings included eight hangars, some office buildings, barracks, the boiler house, and 17-T bays. Some 21 aircraft were damaged on the field, and the northwest half of the airframe was completely covered by 500-lb. and fragmentation bombs. 111

The Ford airframe at Weiner Neustadt was battered by a small force of Liberators dropping 3,642 x 20-lb. fragmentation bombs from 23,500 feet. A total of 37 planes were widely dispersed on the field and only 10 Me-109's were considered destroyed. No fresh damage to the installations was visible. 112 The next day the Ilmurs aircraft factory at Belgrade was hit by 56.5 tons of high explosive. Only partial coverage of the target was secured, but some bombs fell on the Zeum station and marshalling yards. 113

As April drew to a close, the tempo of RhMIL operations was stepped up, and missions against the JF took place almost daily. On 23 April, the VIII Fighter Command carried out a big fighter sweep and fighter-bomber operations against German-held airframes in northern France, Belgium, and Germany. Nine groups of P-38's, P-47's, and P-51's were involved in the raids and two other groups acted as escorts. The fields attacked were at Nannew, Lion, Achmer/Greensche, Lonin-ten, Chievres, Bennain/rouby, Tours, Chateaudun, Brestigny,
le jilot, and 200. There was no enemy opposition in the air, but 7 fighters were lost to flak. The pilots claimed 11 enemy planes destroyed and 24 damaged as a result of the ground strafing.  

The VIII Bomber Command took over the attack on the following day when 754 bombers and 392 fighters were airborne in a mission against several U-boat bases. Of the three divisions involved, the only real opposition of the day developed against the lst, which was attacked by more than 150 single-engine fighters in the Nancy-Oberhoffen- 
hollen area. At this point the lst Division's bombers were considerably 
spread out and the two groups of escorting fighters had their hands 
full. In spite of all their efforts, 10 B-17's were lost to enemy 
aircraft in this phase of the action.  

Several targets in the vicinity of Friedrichshafen were attacked 
by 210 B-17's. The largest gun-carrying factory in Germany, the 
Friedrichshafen Kammgarnfabrik, was severely damaged, and the base air-
field or the bomber complex received an excellent bomb pattern which 
inflicted damage on important buildings. The largest U-boat base of 
the operation (125 Liberators) hit the repair and equipment depot at 
Salingen with 232 tons. The bombing was carried out from the re-
1.1ively median altitude of 1,700 to 19,000 feet. The incendiaries 
started large fires and there were explosions; three of six large 
hangars received direct hits and two hangars were gutted by fire. 
The three-wave attack on Oberhoffen was quite successful, al-
though the bombs of the second wave fell outside the target area. 
Nevertheless, a photo reconnaissance mission showed that every major 
building was now damaged to some extent. At least 12 aircraft were 
ruined
on the field were destroyed or damaged. A good pattern fell on the airfield where 14 planes were damaged, but the bombs missed the equipment depot which was one of the objectives. A total of 40 bombers was lost in the different phases of this operation, but to compensate for this, the very high claims of 103-26-43 were filed by bomber and fighter crews.\textsuperscript{116}

In the 25th, both the Eighth and Fifteenth were active. The Fifteenth sent 111 B-24's to attack the Turin aeroplane factory with fair success, while the Eighth scheduled a series of medium-sized missions against French airfields. The largest operation was directed against the Dijon/Longvic airfield where 298 tons of 6 and 80.1 tons of incendiary bombs were dropped with good results and only 2 hangars left undamaged. Other fields attacked were at Natal/Frescaty and Nancy/Issey.\textsuperscript{117} The increasing emphasis on airfields in the operations of both strategic air forces was due to a suspected change in German production methods. It was not clear that the enemy was dispersing his planes to fields where repair facilities were known to exist. However, it was suspected that at some of these fields, particularly those near already destroyed assembly centers, a small amount of assembly work might be taking place. As a result, airfields were now being watched even more carefully for new activities than were the big production complexes.\textsuperscript{118}

...a significant mission took place on the 26th when 10 combat wings of the VIII Bomber Command were dispatched to attack aircraft plants and airfields in Germany. Low cloud cover prevented visual bombing of the priorities, but five -17 wings attacked the secondary target
of Brunswick using PFF technique. The noteworthy aspects of the operation were the facts that it was completely unopposed and that for the first time there were no bomber losses. Although the weather was poor for bombing it was not so bad as to preclude flying, and therefore does not explain the failure of the GAF to rise to the defense of important German targets.

The next two days were devoted to attacking LCLL targets and airfields. On the 27th, two B-17 combat wings found their assigned airfields cloud-covered; consequently Le Calot and the Ostend/Middelkerke airfields were bombed with fair results. Approximately 200 tons of fragmentation, high-explosive, and incendiary bombs were dropped.

Another task force of three B-17 combat wings successfully hit the fields at Nancy/Essey and Toul/Croix de Lots with 416 tons. The only opposition in these operations came from flak. The following day, along with missions against installations in the Pas de Calais, a force of 110 Fortresses went out against the Luchow airfield and dropped a total of 310.7 tons from medium altitude with very good results. The destruction of hangars was especially effective and 14 hangars received direct hits.

My belief that the extremely light enemy opposition of the last few days was symptomatic of the early death of the Luftwaffe ended abruptly during the heavy attack on Berlin of 27 April. Although not a T/I/L mission, it is worth describing in detail because it affords an excellent illustration of G/F tactics in defense of a vital target. The American bomber forces, some 679 planes strong with 833 protecting fighters, approached the target along a briefed Sea-Hanover line in three massive formations led by the 3d Division with the 1st
following, and the 2d in the unpopular position of "tail-end Charlie."

As the 3d Division led the bombers across Holland, one co but wing left the formation and continued eastward on a route of its own which took it well outside the fighter escort. The enemy fighter controller immediately took note of this error, and when this wing reached the area around Magdeburg where the first fighter Staffeln were assembling, it was pounced upon by 75 enemy planes attacking in waves of 15 to 20 aircraft. In its unopen section condition, the wing was at a great disadvantage and quickly lost 17 bombers.

Meanwhile, the bombers were streaming across the Wannoy area while the German fighter controller held back his fighters waiting for the proper moment to strike. The 3d and 1st divisions were well escorted and were allowed to pass unchallenged. But the 2d Division, which was following in the rear position, was escorted only by one group of F-47's and one group of F-35's. When the division reached Jelle, the F-47 group had to turn back, thus leaving 23 bombers supported by 37 fighters. Here was the moment. As the Thunderbolts retired, 3 Staffeln drew off the remaining Mustangs and 60 to 70 fighters attacked steadily until the bombers reached Berlin. Originally, about 150 fighters had concentrated in this area, but when the correct wing of the 3d Division became separated, about half the 67 fighters lost the Berlin sector to ensure the. Consequently, when our formations reached the city strengthened by additional fighter escorts which had joined them at Jelle, the odds were too unequal and the 3F refused to join battle. Instead, the fighter controller decided to concentrate his strength for

The reports of the division do not explain the reason for the strange behavior of this co 3rd IIA.
A final blow at the 21st Air Division as it withdrew. By this time the 21 was but 10 minutes behind schedule, and when its attendant P-38's had to have because of fuel shortages, it had already missed its rendezvous with the B-38's which were to escort it to a
Consequently, when the 21st division passed over the Kenuo area it was again attacked by about 100 flak guns, most of which had been withheld from action at the target area. As a result of these careful calculations by the German fighter controller, the 21st division alone lost 25 bombers, and the total cost of the day's operations was 63 bombers and 13 flak guns. Eighth Air Force claimed 27-23-15.125

The final operations of the month for the Eighth Air Force consisted of aircrew missions. The Lyon/Aronfield attack was attacked very successfully by B-17's and B-24's near to the German forward line with excellent results. Fighter sweeps were carried out against Tours and Troyes fields and 30 planes were destroyed on the ground.126

Rall was important at the beginning of the 16th missions. It's improvement, both the 16th and the 8th Air Forces' ability to maintain air force's continuous pressure on the air. For both forces, Aircrews were increasing in importance, as the war wore on, they told over those of the ground in the air, and their efforts in doing that successfully attacked the enemy. The 14th Air Force claimed a total of 70 enemy planes destroyed in the air and on the ground. Similar it was for the 8th Air Force with 55.127

The Eighth Air Force began its missions against the Zeppelin airfield, which was located in the air near a major industrial and economic center of the Axis powers.
...here is the basis...as for the air forces, there is little evidence to indicate that the air forces are not ready to carry out missions over northeastern...it is the opinion of the Joint Chiefs of Staff that the air forces are ready to defend their airfields, or even certain bases as such. Other, very...
...appeared over the south, and was intercepted by the 8th Air Force. It was likely to be intercepted by fighters based in northern Italy around the head of the Adriatic, or located in the 1st Fighter Group area in Austria. However, continued and effective attacks of these fields probably considerably reduced their effectiveness. During April, the Fifteenth lost 194 bombers, or 2.1 per cent of the effective bomber sorties.\[^{123}\]

Just at the end of April and the beginning of May, a thorough reshuffling of targets and priorities occurred for both strategic air forces. Many of the objectives which had long been desirable to the pilots and to headquarters of the 8th Air Force were suspended. In south west France, the factories and airfields at Gaubert, Rechfeld, "Michelin," Sillingen, in eastern Germany, "r-Breslau/Leibnitz," "r-Auschwitz/Leibnitz," and "r-Eichstatt were removed from the priority list. Still active targets were the facilities at "r-Dresden/Leipzig," and the supply (1-410) and command (1-517) center at "r-Dresden.\[^{131}\]

In the Steyr/Donau area, the following targets, long famous in the minds of the 8th Air Force personnel, were taken from the active list: "r-Dresden, "r-Heilbronn, "r-Vienna, "r-Ingolstadt, and the Steyr "r-Adlerwerke. The works 1 and 2 at "r-Heilbronn, the airfields at "r-Munichendorf, "r-Bollendorf, and "r-Adlerwerke were still open for attack, as well as the textile mills at "r-Leinfeld, "r-Adlerwerke, "r-Munichendorf, and "r-Vienna, recently said to be had by the 8th Air Force.
also kept on the list were Steyr-Manh�er-a us, the 1109 component plant at Ilmenau, and the Cruse/Thalerhof airframe.¹²²

In northern Italy, the suspended targets were the Nervio Millia aircraft factory and the ball-bearing plants at Turin and Villar Acro. The Locchi factory at Parma, the airframe at Milan, and the Turin Aeritalia factory could still be attacked. Miscellaneous targets at Cracov, Nurnberg, Anlereon (Greece), Ialalma (Greece), and Annecy (France) were kept open.¹³³

In the Balkan area, the suspensions were fewer, being confined to the Jagoszarski plant at Zemun (Yugoslavía) and the Hungarian Avro works at Győr. All the other Balkan targets still to be attacked.¹³⁴ For the Eighth Air Force, important targets still remaining were at Saraje, Kukav, Dornsberg, Cottbus, and Kioising.¹³⁵

Basic priorities for both air forces were readjusted on 16 Mar. It will be recalled that late in March some questions had been raised concerning the bombing of targets in southeastern Europe and their relation to the AETNA program. It was now definitely stated that AETNA had priority over these targets, except when weather prevented attacks on AETNA objectives.¹³⁶ For the Fifteenth, the objectives were: (1) to support the land battle in Italy, (2) AETNA, (3) rail communications in southern France, and (4) targets in the Balkans.¹³⁷ It was further stated that in southeastern Europe, communications were the priority objectives; however, when tactical considerations were paramount, the Fifteenth was authorized to combine attacks on oil refineries with communications.¹³⁸ The Eighth was still authorized to consider AETNA as number one
priority, but second place went to railway centers in occupied countries, and third was assigned to airdromes in German-held territory.\footnote{139}

Operations in northwest Europe were hampered by bad weather during the first week in May. The Eighth sent a small force against the Poix, Fontenoy, and Roye/Our airfields on 1 May but little was accomplished.

A big mission was scheduled for the 4th and was actually airborne, but heavy clouds caused recall of the bombers. Since some of the leading formations had already reached the Dutch coast, B-24s dropped their bombs on the Terne/Ambar airfield. The results were probably good, as heavy black smoke arose from the target. There were no bomber claims or losses.\footnote{140}

The Fifteenth went into operation against airdromes on the 6th. A large force was sent against memorandum targets and led Fortresses of the 5th Wing were detailed to bomb the Krassov aircraft factory and airdrome. 4325 tons of 500-lb. G5 bombs were dropped along with 21,655 tons of fragmentation bombs. The results were good. The frags covered the airdrome and landing area, and the high explosives landed on four corners, the workshops and the main administration buildings.

Six aircraft on the field were destroyed and four were damaged.\footnote{141}

After several missions against P-47 targets, cities, and communication centers, the 15th returned to counter-air targets on the 13th. A large number of B-27s was dispatched to strike at three marshalling yards and eight airfields in France and Belgium.

The exact definition of "WAC" has never been clearly established in current usage. Sometimes airbases were considered a part of it, and sometimes they were placed in a separate category. Obviously, attacks on them were a part of the war against the Luftwaffe.
There was very little enemy opposition, for it appeared that the German anticipated deep penetration from considerable inland and were concentrating further inland. Only one formation of bombers operating in the vicinity of Lille encountered active opposition; the remainder were practically unobserved. The aircrews bombed and the number of planes attacking were as follows: St. Amand (110), Florence (165), St. Jizier (74), Thionville (54), Ecuvincourt (72), Léon/Mézières (127), Léon/Beauvoir (124), and Lille/Vendeville (19 as a secondary). Bombing results were considered uniformly good.\(^{142}\)

On the 13th, the Eighth planned a large mission against German aircraft production at the extreme limits of the bombers' radius of operation. Attacks were scheduled against the F. plants at Freising and Jossen in Poland, and against the airfield and airport at Tutov, Germany. Unfortunately, weather seriously interfered with the bombing. The overcast at Freising and Jossen prevented bombing, and the bombers assigned to these objectives attacked targets of opportunity. Only at Tutov was the bombing carried out as planned; here 226 B-24s reached the area and bombed with fairly good success on the eastern part of the field. Only 12 bombers were lost in these deep penetrations and total claims were 62-5-16.\(^{143}\)

Airfields were still high on the priorities of the Fifteenth. Misurina and Legio Lulia airfields were attacked on 14 May by 121 and 75 heavy bombers respectively while 40 P-38s strafed the air bases at Vicenza, Villaerba, and Rivolta. The bombing was satisfactory and the fighters claimed 19 enemy aircraft were destroyed on the ground.\(^{144}\) In the same day, other fighters of the Fifteenth strafed
airfields at Asiago, Villa France, Forli, Reggio Emilia, and Modena. At Forli, several hangars were set on fire.145

Meanwhile a new list of priorities was being worked out and on 15 Nov, General Eaker sent it to General Arnold:146 its first priority, the following targets were listed:

1. Ploesti airfield and airport
2. Auto-Litho-ach factory at Tg. Vrsosdorff
3. Dornier factory at Chernoffenhofen
4. Munich/Treiberg airport
5. Zalata airfield
6. Volois airfield
7. Munich/Hei airfield
8. Dornier factory at Taunus;
9. Graz/Kollerschlag airfield

The secondary priority contained the following objectives:147

1. Zalata airfield and airport
2. house airfields
3. Fuller air-bearing factory at Krenberg
4. Extension of the Dornier Heustat complex at Ebgenfurt
5. Steyr-Donner-ruch plant at Steyr
6. Dornier Heustat extension at Kremshoven
7. Dornier Heustat extension at Stettendorf
8. Dornier Heustat extension at Krenberg
9. Dornier Heustat extension at Voels
10. Steyr-Dal Dorn-Tuch plant at Graz/Kollerschlag

The third priority dealt with airfields and listed the following:148

1. Zemun
2. Russov
3. Krasnodorf
4. Ebgenfurt
5. Kremshoven
6. Torek airfield and assembly
7. Vienna/Teurn
8. Vienna/Tulln
9. Horoing
10. Himis
11. Leuberg
12. Komsen
13. Kalamaki (Greece)
14. Gyor

The last 10 days in Nov were a transition period: KNILFT was "diving" to GHQ. It is the time for invasion drew near, every effort was made to increase the pressure on the Luftwaffe. Both the Ninth and Fifteenth were extremely active against airfields, especially the former since it was under the imperative necessity of striking the
rields from which the Germans might launch counterattacks on the Anglo-American landing forces.

On 20 Nov., the Eighth led off with attacks on two French airfields and one aircraft repair center. Lyons/Chappes was attacked by 60 Liberators with very good results. Seven direct hits were scored on hangars and the west side of the landing area. Only airfield received 267 tons from 70 B-17's and a good coverage of the target resulted. Four firing points were assigned at the Villacoublay aircraft facilities and all were hit. Bursts blanketed the Morane Saulnier assembly works and there were hits on 10 factory buildings. A 70 burst fell in the hangar and burned an area of the plant. Another large group of bombs fell on the Yord aircraft works causing considerable damage.\(^{149}\)

In the 23d, a very large force of 1,045 bombers escorted by 1,135 fighters were dispatched to attack marshalling yards and airbases in France. The air opposition was practically nil, but the weather made up for the lack of German activity. Only 375 fighters were able to attack, and ground haze rendered target identification uncertain. As a result, the bombing varied from poor to good. The airfields attacked were at Sosses, Noyon, Orleans/Ivry, Saint-omer, Compiègne, and Soissons/Amiens. Probably the most successful attack was against the Orleans/Ivry field where 309 tons of 8, and 70,000 tons of incendiary bombs were dropped from relatively small altitudes. Transition units, fueling sites, dispersed areas, and hangars were all hit.\(^{150}\)

The next day a large force was dispatched to Berlin, having been
needed to attacks on industrial areas. This will very
helpful because with the present, not all aircraft are, have air
rooms, which means a lot of trucks, and it will make it more easy to air all the forces.

We are planning on using the 1st for the imminent invasion of
the continent, and we are going to increase the area of our forces.
Our hope is that the terrain will slow down our advance,
without inflicting too much damage, and that it will also
serve as a base for the air forces to use as a base for
our targets of opportunity.

It was the objective of the first few missions, but only 23 hit the
air base, with poor results; it is now the 2nd/3rd day that
is giving us good results. The area was nearly cleared of
aircraft, and the objective of the first few missions,
which were to be used as a base for our air forces,
was accomplished. But of
last-minute
pressures to
required us to use even more of our resources.

This area was not initially considered for invasion. It was
initially cleared of aircraft, and was not seen as
a potential target. But the need to use all resources,
including our aircraft, led to a change in strategy.

I am not sure how much of this is due to the
aircraft, or poor planning. It seems to indicate that
our efforts need to be focused elsewhere.
the French airfield at this stage. The writer would add the statement that the French A/C was still engaged and operational to be a real air force in the air. The 316th "A" Fd was established to support the 316th "A" Fd by an additional 50 fighters in the air but without success. The 316th "A" Fd was lost. The rest of the 315th A/C was destroyed by 24-30 B-17s at discretion of time in time and place. While this is a less critical light, it was still in the front as to some of the hours of fire. An additional five to ten hours or three times the duration of the air raid, as it is believed that if the fire were continued, the 315th would have been destroyed and sixty-five enemy bombers were sent out on the raid against the French Airfield at entaller.

Major-We hit by 232-30 tons with very good results. No main installations such as hangars, barracks, crew rest quarters, admin-
istration buildings, and poor transport facilities were hit. In the northwest hangar and runway were well ordered, the fuel as proven in fire test, which had been set for during the critical days of the main hangar, was also attacked during the raid on entaller. Strike photos revealed direct hits on various hangars, 2 hits on the repair shop, 5 hits on the repair shop, 5 hits on the administration building, and 150 rounds on the northeast hangar. The 3-24 failed to return from this mission.

The 5th Air Force concluded the month's operations by five tremendous missions (27-31) against the aircraft, oil, and transportation targets. Over 900 fighters were involved in each operation and the total losses were 37 aircraft as well as the
case seem to exceed the 311,000, although there was not the same concentration on rail in targets. On 27 Aug, forces totaling 991 bombers were dispatched to northeast France and the minimum to bomb certain air, etc. largely connected with rail communications. However, two small two forces attacked Aero-engine plants. The Junkers (Junkers) Aero-engine plant at Strasbourg was hit by 53 Fortresses with good results, and the engine factory at Eppel near Potsdam was bombed by 69 Liberators with results that were estimated as fair to good.157 There was only moderate Fl opposition. Fifteen heavy bombers were shot down and 7 fighters were lost. Claims against the enemy testified to the lowness of the defense, being only 36-4-13.158

The next day the pressure on the Reich was increased when 1,027 heavies went out against all refineries, aircraft works, and a military depot in central Germany. The attack was made by two task forces: one, which opened the battle, made a diversionary raid southwest to Ludwigshafen, then turned north to bomb Koln and withdrew. The enemy was not deceived by this attack and proceeded to concentrate 350 single-engine and 50 twin-engine fighters in the Ludwigshafen area to oppose the main force which was rapidly approaching from the Rhine line in the direction of Wittlich. In reaching this point, the formations separated to bomb their various targets, and at this moment the German fighter controller threw his heavy concentration at the tail of the 1st Division and the leading formations of the 3d. By concentrating his forces, the enemy was able to achieve a temporary superiority which saturated the fighter defense and brought down 13 bombers. The rest of the opponent was grossly confused from
...the air. Most of the bombing effort was not directed against the German aircraft industry; however, small forces raided a Junkers aircraft assembly and engine works at Dessau and airfields at Brandis, Holzn, and Justenschen. Due to the interference of haze, smoke, and cloud, the results were generally poor. Losses in the whole operation amounted to 32 bombers and 14 fighters. Although the Luftwaffe offered severe opposition in only one phase of the engagement, the battle was fierce and many German planes were shot down. Total claims against the enemy came to 69-31-36.

The Eighth did better against the German aircraft industry on the 25th. Two hundred and fifty-one Fortresses were dispatched against the e-109 plants of the Arka complex in the Leipzig/Weiterbild area, and the Ju-13 assembly at Leipzig/Neukau. The bombing here was rated fair to good. Another force of 279 B-17's attacked AM facilities, including the components plant at Rosen and the assembly factories at Cottbus, Pressen, and Schoen. The results at Pressen and Schoen were good, but the bombs at Cottbus—where Rosen was less accurate. The opposition appeared to be confounded by a double-thrust approach with one formation coming up over the North Sea and another apparently headed straight for Berlin. Consequently, the Luftwaffe was scattered and its defense was effective at only one point. Total bomber losses came to 34 planes and claims against the C-7 were 79-14-21.

The next day another massive formation was dispatched against airfields and factories, marshalling yards and rail installations along the French coast. All the bombers followed approximately the same route until the Dutch-German border was reached; then the 1st
Division continued deep into the Reich to attack certain aircraft factories, while the other formations turned out to be "shallow" targets. The Junkers parent plant at Dessau was hit by 79 B-17's and extensive damage was caused. Machine shop, a workshop, and seven engine-testing beds, as well as offices and storehouses, were completely destroyed. The 150,000 plant at Cachelkeeten, which had been often attacked and promptly repaired, received the attention of 51 B-17's that inflicted extensive injury. At least 10 direct hits were scored on a large machine shop and other installations were damaged. The 150,000 plant lost its boiler house, several office buildings, and a large workshop. The recreation center, storehouse, motor transport yard, canteen, fire station, and an office building were partially destroyed. The local airfield was attacked by 48 bombers that were able to cover the southern half of the landing area with bursts.

One of the largest targets was the airfield at Zotenburg. Six heavy concentrations of high explosives and incendiaries were dropped by 147 B-24's in the target area and the objective was blanketed by bursts. At the airfield and seaplane station at Czaschewim a good concentration was secured on the southern part of the field, and similar results were achieved at Cilenburg. The C.F stations at Bierholz and Lintorf were bombed by small forces with satisfactory results. Only the 1st Division ran into any opposition, and this was doubtless because of its deep penetration since the Luftwaffe now soldi6 concerned itself with operations over Belgium, Holland, and northwest France. Going to the fact that a part of the division got six minutes ahead of schedule.
and lost one of its escort, the B-26's had to fly a brief attack
with some success. Twelve fighters were lost during the day, but at
considerable cost to the enemy. American bomber and fighter kills
were 6-7-0.165

The final mission of the month was largely devoted to rough illus-
trations and bridges. However, nine units struck the Airdrieas at
Linzell, Liep., and Chlaza-Lijon. A raid on the two-engine factory at
Delaby had to be canceled because of weather. There were no claims or
losses.166

While the Eighth was thus making history over the roofless
Festung Düsseldorf, the Fifteenth was finishing up its attacks on Ger-
man fighter production in southern Germany. Unlike the Eighth, tactical
considerations did not force the Fifteenth to concentrate on fighter
airfields. Its early attacks had apparently been effective, for a
comparison of the photo reconnaissance of 13 April with one of 29 May
showed a great decline in aircraft on fields within the Budapest area.

On the former date, there were 123 single-engine fighters, 26 Fw-110's,
and 101 He-111's at Iadaras, Vossos, Listerfold, and Taloa. In 29 May
there were present at these same fields (plus Lオススメ and 3-choofo-
ver) 17 single-engine fighters, and 29 He-111's and 410's. Of special
interest was the fact that the 29 May reconnaissance noted no
activity of any kind at the Taloa airfield and factory.167

(2) —1242, the Fifteenth carried out a big operation which
virtually gave the city one more to the American "frontal attack." This
target was attacked by 104 Liberators carrying 219,73 tons with dev-
"lating effect. The photo recon shows that the larger end factory

[Handwritten note]
are completely saturated with bursts. Many aircraft were destroyed or damaged on the ground and there was considerable blast damage. At least 10 direct hits were seen on the hangars. Another B-24 force of 120 Liberators bombed the Ebersdorf aircraft factory. Siting were the assessment of damage difficult, but three direct hits were located on the main factory buildings and the area between the main building and the factory road was blanketed with bursts. A third task force of 334 planes was dispatched to the Ebersdorf airbase. This target was covered by 740 35 tons of different types of explosives. Direct hits occurred on five hangars on the north side and six hangars on the south air-raid shelter. Workshops, storage buildings, administration offices, and barracks were all covered with bursts. All fires and explosions were evident in several places. That this was a vital target was evident from the G-2 reaction. Some 150 fighters attempted to intercept the bombers, and, killing this, concentrated on stragglers and bombers wounded by flak. Five bombers were shot down in the air battle and two were missing; the enemy lost 18 planes in the air and 12 on the ground, according to the claims of the bomber and fighter crews. A total of 13 bombers failed to return to their bases from all these operations.

This operation was so effective that it was believed possible completely to eliminate the remaining members of the Ebersdorf complex in one more operation. Four units were still suspected of performing important functions in Ebersdorf production; these were the Ebersdorf airfield and aircraft factory, the Ebersdorf factory, the Ebersdorf spinning mill, and the Ebersdorf carpet factory.
The ole plant was formerly engaged in the repair of bombers, but it was believed that this had been suspended for some time. Reconnaissance of 2 August showed 110 planes present of which 94 were Mark XIX-109's and 24.105's. This further substantiated the belief that the plant was engaged in fighter production or repair. It was known that Jesenik was engaged in the manufacture of aircraft components and it was believed that, specifically, these were wings and fuselages for Messerschmitt planes. Less was understood about the Rettenberg and Breclav facilities, although the former had certainly received some of the Dornier-19's disassembled production. It was now thought that these functions were some of the total-shaping work and fuselage subassembling formerly done in the II of the Dornier-19 plant.

The Breclav plant had been converted into a component plant for fighter aircraft, although it was not clear which components were being produced, but the plant was suitable for making small parts and carrying out the subassembly of fuselages. It was definitely considered an important unit.169

Consequently, a combined day and night operation on a very large scale was organized by the Fifteenth for the disassembly of the component plants of the Dornier-19 at Dorn, and the other targets. The first phase was a small two-hour sweep on 15 June when 33 Wellingtons were dispatched to bomb and strafe the airfield at low altitude. The second was a well-concealed attack with gun strings across the field supported by explosions and fires.170 Two hours after sunrise, the main attack was released by a 1.1, 2.1, and 3.17's, accompanied by 137 1.5's and 55 2.1's, and 36 against the factories.171
received 17.5 ton of 8 mm tons of incendiaries, at the entire
bar at the covered area. Heavy smoke cleared prevented later
accomplishment. Bredigord was shelled up to 10 hours, but
unfortunately it was not hit. In the target area and the attack
must be counted a failure. Better luck occurred at Bredigord. Here
54 - C2's accomplished a good service and practically all
buildings in the area received direct hits; 55th was a
additional loss in men and material; although there were no hits on
installations, last of all to be heard is the target. The remaining
squadron still did her bit to shatter 55th in A. Sky was
there and red to the east were all covered in a layer of
orange smoke. Only one building received a direct hit and 2
issues from the amm. smoke clovered the area, one I am not. without
was struck seven times, to other times.171

With the end of A, the situation has shifted from an area to
other targets. However, it is still that the destruction of the
infrastructure has not been completely carried out.172 All the original
units now in the rear of the original units in the area to
are of the unit to check and establish, which
in turn will further to secure the unit
in the rear, position of the Jomini's priorities, so the unit to the
cost of another unit to still affect on the Jomini.

54th in B with smoke as smoke established new records in
all to order. 54th in B were some 12,765 effective units
attacked to cover all days of the area. All, except
will still be shelling up the enemy. 54th was considered in the
Nevertheless, the Middle East continues to bear close examination. It is still a question whether the British can or will continue to exercise control over the affairs of that region. The situation is complicated by the fact that there is still no agreement on the future of the Middle East. The British are concerned about their interests in the region, but they are also aware of the need for stability and peace. The United States is also interested in the region, but its role is less clear. The question of how to handle the crisis in the Middle East is a complex one, and there are many different opinions on how to proceed.
Chapter VII

C. CHECK:

Before any summary up of results can be attempted, the reader needs to recall certain problems connected with the writing of this study. One of the principal difficulties was not so much a lack of information as its variety and diversity. For example, statistical information on the bomb load, number of planes dispatched, number bombing, and number lost on each mission can be found in the unit histories, the Tactical Mission reports, the bomber command operation narratives, and in the files of the Office of Statistical Control, Headquarters, U.S. Quite often all these sources gave different sets of figures for the same operation. Furthermore, there was often disagreement as to the results of a particular bombing mission. Sometimes the overcast prevented any estimate whatsoever of the damage done; sometimes the photographs were poor because smoke or clouds got in between the lens and the target. When excellent photographs were available in quantity, the interpreters disagreed among themselves as to exactly what effect on production the destruction of a certain building would have.

Even less certainty exists in the case of German planes destroyed by our formations, on the ground or in air combat. That such claims might be made in perfectly good faith and yet be considerably exaggerated in the excitement and stress of battle was early recognized.
by the ...F, and great pains were taken to make the official reports as accurate as possible. Nevertheless, American commanders such as General Doolittle admitted the unreliability of such figures,¹ and the British frequently complained that their estimates of destroyed, probably destroyed, and damaged were much too high.²

Considerable variation also exists in the estimates of German plane production. Although the ...F frequently used the ...ir Ministry Estimates in its planning, it was believed that these were apt to be too conservative. However, when ...2 worked out its own estimates, ...2 disagreed with them. And lastly, the leaders of the German aircraft industry themselves were apparently uncertain as to the actual number of planes they produced. Although they seemed to agree on the number made during the peak month of 1944, there was not such unanimity on just what month this was. In view of these differences of opinion and information, the following attempt to summarize some of the results of the war against the Luftwaffe should be seen in its true and tentative aspect. These conclusions are only probabilities. They seem reasonable on the basis of the information available at the end of August 1943, but better knowledge of the facts may obviate any one of them at some future time.

With this preliminary caveat disposed of, it seems possible to begin, like Descartes, with one fundamental fact. The Luftwaffe was not destroyed. Apparently, in 1943, some of the leading American air authorities were still hopeful that this could be done, but by the spring of 1944 a new tone is evident. As pointed out in the previous chapter, one heard less of destroying the German fighter strength.
and more about containing it, or rendering it ineffective. One high-
ranking officer said quite frankly that it was probably impossible to
destroy it. 3

Not only was the industry able to survive, but, quantitatively
at least, it increased. Although the attacks of 1943 did not cause
the aircraft industry much damage, the raids of February 1944
apparently caused a drop in production that may have been felt for two and one-
half months. Nevertheless, the industry managed to survive this crisis
by drawing heavily on reserves, striking the training program of
planes, reducing the training time to the lowest minimum of hours,
and above all, ruthlessly carrying out dispersed plans already under
way. 4 Terrific difficulties were encountered: moving the industry
underground, using every available workshop, no matter how small,
every factory to produce parts, replacement of workers, moving and
housing the workers . . . [these] were but a few of our urgent
tasks. 5 In spite of all these difficulties, production began to
increase and hold certain authorities are in agreement that at its
peak it came close to 7,000 operational types in the fall of 1944. 6

How was this possible in view of the tremendous weight of the IP
attack on German production? The dispersal of factories, as indicated
above, was undoubtedly a factor. But there were other consid-
erations. If one can believe the Germans, it is possible that it resulted in concentrating on the airframe assemblies. Göring believed
that it would have been much more effective if we had forced manu-
facturers of individual parts instead of the complete assem-
bies, and he cited the case of the A-10 to illustrate this point. He largely
destroyed in one highly successful raid; yet production on the F-105 was not really hindered since it could be easily transferred elsewhere as long as the shop of important parts was not interfered with. This evidence was corroborated by Dr. Earl Ryder, chief of the airframe section, and Dr. A. H., president of the North American company.

Dr. Ryder mentioned that the first attack on February 17, 1944, occurred only when machine tools were destroyed. The attack on Islip was much more effective than the impressive destruction at Rochelle because the machine shops at the latter plant were moved. On the other hand, one of the larger companies considered extremely destructive because 50 or 60 of the facilities for processing of metal parts were destroyed. These conclusions were supported by the fact that the machine tools could have been more vulnerable except to airframe companies. The real vulnerability in the interruption of the war-time plants, but also the shock, of the time descent and the days, has been that it was no difference which of the airframe shops, according to the chief airframe and war-time plants were at what port nears.  

Almost all of the major air authorities interrogated by workers during the raids believed that the hardware and incidentally, the aviation or any aviation, could not be moved out such earlier if all facilities had been in the same. The only ones this statement that have been, but according to Hidra technical, 4th and main industry that could not disperse is made to other like the armament industry. Likewise, transportation, from it is finally breached or heavy forces in the
The latter half of 1944, while not a single day of this conflict for the military. A decisive aerial or land operation. A complete failure of the major surface destruction, but the air force could not.

The question of the aerial bombardment, as a brief check, is one in 1944, as this was and over the extensive reactions. It扇 both positions to oil into war, while in the case
where we were not absolutely necessary. Also in the discovered, that above burning coal could often be substituted for other fuels. In so far as the plant's remains was unsuccessful in the opinion of the rival
but increased in part of time in which claimed subject to offset
the indirect effects of the burns on machinery and other elements.

To summarize the results of the intermissions, one of the major
will and the aircraft industry was a less vital task than certain other.

accord to scoring, the priorities should have been as follows:

1. Fighter ace production
2. Bomber production
3. Training
4. Repair work
5. All other military
6. Artillery

After Mr. Hart claimed his opinion, it resolved:

After the war is done, everyone is elated. We had to do all
the work that we did, but we'll have no interest. Only the
aircraft industry, then not directly.

not all have because they're too difficult to replace. We also have difficult to hit. The people

With the aid of oilers and labor, civilian machinery, shipping, and

Held several beliefs about and the transportation network. He e

The next decisive factor in the collapse of Germany. Next to this he

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placed the industrial heart of the nation. "In
this connection," he stated, "I would like to stress that the terrific
losses that was inflicted throughout Germany as a result of your
air attacks was out of all proportion to the damage inflicted on
armament production. Here is a chance the possibility to disperse the
production. Only the oil industry was beyond repair." 15

If these events by high-ranking military and civilian authori-
ties in the Reich suggest that the Partisan fights have been eliminated
more quickly and more thoroughly as a factor in the war, it could be
well to remember that, as Mr. Ryder said, "After the war is done,
everyone is clever." The proper selection of targets for strafing
bombing was a matter that received the most intensive study by both
British and American authorities, and doubtless the objectives attacked
were chosen on the basis of the best information then available. For
should it be assumed that the anti-aircraft air offensive against the
German air force was taken lightly in Berlin? As a matter of fact, it
caused the most serious concern, and in the words of Major Heubert, an
operations officer on the U.S. General Staff in Italy, "And it not been
that we were fighting...desperate, fanatically defensive war, our air-
craft industry could have never overcome your bombings."16

When due allowance is made for the fact that production of Dornier
aircraft increased during the middle of 1944, it must also be remembered
that these figures were considerably less than the goals the Germans
had set for themselves. According to Dr. Tilt, Dornier production was
set at 3,000 for March 1944, but by September (which may for
January considered the real month) output had only reached 2,00 per month."
and it may have been considerably less. Thus there is little doubt that the "HALF-BI" offensive held down the expansion of the aircraft production to a minimum.

Another effect of the counter-air offensive was to create a serious pilot shortage in the Luftwaffe, and this may explain why so few of the aircraft produced in 1944 became actually operational. Naturally, the training program was at once affected. Training of pilots, which had once been a four-year affair, was reduced to 14 air hours by 1944. The growing number of poorly trained, inexperienced pilots also reacted against the increase of operational planes, and Dr. Tark estimated that 25 per cent of aircraft wastage was caused by crashes on landings and other accidents which could be attributed to pilot error.

The complete failure of the Luftwaffe to stop the Allied landings on the Normandy beaches seems to have resulted from a combination of some of the factors discussed earlier in this chapter. According to the highest German sources, the Cotentin peninsula the west bay of the Seine had long been suspected as possible landing areas for a cross-Channel invasion; complete surprise does not seem to have been achieved. Furthermore, enough planes to have offered a stiff defense appear to have been available. Why, then, was the T.T so completely helpless during the Normandy invasion?

For one thing, there was the shortage of experienced pilots just

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According to Dr. Koehler of theocked-all company, the average monthly production of the F-190 during 1944 was 1,000. During June, the maximum of 2,900 was achieved, but by September this had dropped back to 1,900. See 10 2344 in -2 Library.

It is only fair to state that Dr. Tark believed the oil shortage played an important part in reducing the number of air hours required in training.
referred to. Transportation difficulties, usually associated with the movement of the ground troops, also caused trouble for the Luftwaffe. As the Allied tactical air forces successfully interdicted the battle area from its hinterland, it became almost impossible to move short-range fighters into the area where they could reinforce the already greatly outnumbered Staffeln. The intensive bombardment of German-held air bases in northwest France also contributed to the impotency of the German fighter strength by making it very difficult for the GAF to operate in the battle area itself since most of the bases were ruined. And above all, there was not enough fuel to keep a large fighter force constantly in the air. Consequently, at the most critical moment of the war when the walls of Hitler's Festung Europa began to crack open, the vaunted German air force, the destroyer of Guernica, Warsaw, and Rotterdam, and Polish, Dutch, Russian, and French civilians beyond counting, was forced out of the air without a struggle.

For by the time the American and British soldiers were sloshing through the German surf and clambering up the beaches, victory over the Luftwaffe had already been won. The great air battles over Berlin, Scheinfurt, Memel, Lwów, and Regensburg were all important landmarks along the road. But perhaps the greatest achievements were made far from the battle lines. The development of the long-range fighter, the indomitable flying qualities of the B-17, the tremendous build-up in little more than two years of four air forces operating against Europe were victories against the Nazis as important and as far-reaching as those in the air. The final and complete history of the war
against the Luftwaffe. As written, it will be the story of the combined skill of the pilot, bombardier, navigator, and ground crew united with the technician, the scientist, and the engineer, for it was by all of these that the German Air Force was defeated.
NOTES

Chapter I

1. As late as the end of 1942 a considerable number of bombers were being manufactured for the GAF. Air Staff estimates of production at the end of 1942 were 905 bombers, 720 fighters, and 233 service planes per month. Notes on G-2 (Air Group) Estimates in CQA papers. Intelligence file.

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10. Interrogation of Keitel, KO 18991 in A-2 Lib.

11. Interrogation of Dr. Tank, 17 and 24 April 1945, KO 23447 in A-2 Lib.

12. KO 18990.

13. KO 19001.

14. KO 18991.

15. KO 18418.

16. KO 23447.

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18. Ibid.


20. Ibid.
BIBLIOGRAPHICAL NOTE

The most important sources used in the preparation of this study were histories, tactical mission reports, and combat narratives from the theater; and cables, reports, and correspondence in War Department depositories.

In the former category, much useful information was obtained from the several volumes of the History of the Fifteenth Air Force, primarily a collection of selected and well-arranged supporting documents. Even more valuable was the History of the Mediterranean Allied Air Forces, a first-rate job of historical reporting extending to 53 volumes. Volume I is devoted to a narrative account, and the remaining volumes contain valuable documents of all kinds.

The operations of the Fifteenth were adequately described in various histories, in the Intelligence Operations Summaries (Intops Summaries) issued by MAAP, NASAF, and other headquarters, and in the tactical mission monographs published by the Fifteenth. These last were especially important in giving the background and significance of the more important missions.

Information on operations in the ETO can be found in the histories of Eighth Air Force Headquarters and subordinate units. There are also the tactical mission reports, and the bi-weekly summaries issued by General Eaker which terminate at the beginning of 1944. With the establishment of USSTAF, similar summaries were prepared by that
headquarters for the record of operations.

The War Department cables to and from the various theaters are important, especially in dealing with questions of policy. Many of the most valuable cables were not found in the usual files, but had been removed to the office of the chief of the Message and Cable Branch. The Operations Letters classification in AAF Central Files, and the documents in the Office of AC/AS Plans frequently yield important correspondence; both collections were often consulted by the writer of this study.

In the preparation of the first chapter dealing with early German aircraft expansion and the first steps toward setting up the Combined Bomber Offensive, some significant papers were found in a dossier collected by Lt. Col. James T. Lowe, while with the Operational Division of AC/AS, Intelligence. Since this dossier does not properly belong to any particular archive, it is referred to in this study as Intelligence files. This reference should not be confused with the Intelligence Library. Most of the statistics cited herein come from the Office of Statistical Control, Headquarters AAF.
## GLOSSARY

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<td>A-2 Lib.</td>
<td>Intelligence Library</td>
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<tr>
<td>AFTIH</td>
<td>Historical Division</td>
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<td>AFMSC</td>
<td>Office of Statistical Control</td>
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<td>ASC</td>
<td>Air Support Command</td>
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<td>BMW</td>
<td>Bayerische Motoren Werke</td>
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<td>Ca</td>
<td>Cernoni</td>
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<td>CBO</td>
<td>Combined Barbar Offensive</td>
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<td>CCS</td>
<td>Combined Chiefs of Staff</td>
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<td>COA</td>
<td>Committee of Operations Analysts</td>
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<tr>
<td>CQP</td>
<td>Combined Operational Planning</td>
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<tr>
<td>DB</td>
<td>Daimler Benz</td>
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<tr>
<td>DO</td>
<td>Dornier</td>
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<tr>
<td>D/OFS</td>
<td>Deputy for Operations (British)</td>
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<tr>
<td>FW</td>
<td>Focke-Wulf</td>
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<td>GAF</td>
<td>German Air Force</td>
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<td>He</td>
<td>Heinkel</td>
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<tr>
<td>Int Ops Sum.</td>
<td>Intelligence Operational Summaries</td>
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<td>JCS</td>
<td>Joint Chiefs of Staff</td>
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<td>Ja</td>
<td>Junkers</td>
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<td>Le</td>
<td>Macchi</td>
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<tr>
<td>LNAF</td>
<td>Mediterranean Allied Air Forces</td>
</tr>
<tr>
<td>MAP</td>
<td>Ministry of Aircraft Production (British)</td>
</tr>
<tr>
<td>Me</td>
<td>Messerschmitt</td>
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<tr>
<td>MIAA</td>
<td>Muhlensbau u. Industrie A. G.</td>
</tr>
<tr>
<td>NAFAF</td>
<td>North African Air Forces</td>
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<tr>
<td>NATO</td>
<td>North Africa Theater of Operations</td>
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<td>OPSUM</td>
<td>Operational Summaries</td>
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<td>OSS</td>
<td>Office of Strategic Services</td>
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<td>PFF</td>
<td>Pathfinder</td>
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<tr>
<td>P/W</td>
<td>Prisoner of war</td>
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<td>Re</td>
<td>Reggiane</td>
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<td>SE</td>
<td>Single engine</td>
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<td>SH</td>
<td>Savoia-Marchetti</td>
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<tr>
<td>USSTAF</td>
<td>U.S. Strategic Air Forces in Europe</td>
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<tr>
<td>USSTAF (E)</td>
<td>Vereinigte Kugellager Fabriken Werke</td>
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