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THE REICH WRECKERS: AN ANALYSIS OF THE 306TH BOMB GROUP DURING WORLD WAR II

by

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14. ABSTRACT

This paper presents an analysis of the 306th Bomb Group?s contributions during World War II. Rather than providing a simple recounting of the various dates and accomplishments, the paper analyzes some of the key indicators and statistics of the group?s performance. In particular, the paper focuses on comparing aircraft losses and bombing results of the 306th with the Eighth Air Force?s. The analysis also examined other areas, such as: mission aborts, enemy aircraft claimed destroyed, weather conditions over target, bombing methods used, presence of fighter escorts, and strength of enemy air defenses (enemy fighter aircraft and flak). The purpose of the analysis was to gain a better understanding of the group?s overall performance within the bigger scope of the Eighth Air Force?s war effort. The analysis was conducted in three steps. First, the archives of the Air Force Historical Research Agency (AFHRA) were searched for statistics on the 306th. Next, similar statistics were collected for the Eighth Air Force. Finally, the data for the two units was analyzed and compared, to aid in determining conclusions. To facilitate the last step of the research, the air war was divided into four periods. The goals and objectives for each period were used as criteria to grade the unit?s effectiveness. In general, the study concluded that the 306th Bomb Group was a ?typical? B-17 bomber group in World War II. When comparing the various statistics and graphs provide in this paper, we see that in most cases there was little difference in the data for the 306th and the Eighth Air Force. However, the statistics do not tell the whole story. As one of the cadre groups of the Eighth Air Force, many of the improvements and lessons learned during the early period of the war were at the expense of the 306th. Theses early lessons and experiments were important and led to the improvements that saved many lives and brought an end to the war.

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Chapter 1

Introduction

> *In bombers named for girls, we burned The cities we had learned about in school—Till our lives wore out; our bodies lay among The people we had killed and never seen. When we lasted long enough they gave us medals; When we died they said, "Our casualties were low."*[1]
>
> —Randall Jarrell

Throughout World War II, there were over forty bombardment groups that served honorably in the Eighth Air Force. However, this paper focused on one particular unit—the 306th Bombardment Group (Heavy). Constituted on 28 January 1942 and later stationed at Thurleigh, England, the 306th became the Eighth Air Force's longest serving bombardment group of the war.[2] As one of the Eighth Air Force's cadre bombardment groups, the 306th helped pave the way for other groups to follow and went on to achieve many accomplishments for the war effort.

Purpose

Rather than providing a simple recounting of the various dates and accomplishments of the 306th Bomb Group during World War II, this paper analyzes some of the key indicators and statistics of the group's performance. The purpose of the analysis was to gain a better understanding of the group's overall performance within the bigger scope of the Eighth Air Force's war effort. In the course of performing the analysis, the paper also

presents many of the specific achievements that support the conclusions. The goal of the study was to provide military historians, former members of the unit, or other individuals interested in the subject with a view of how this one unit contributed to the overall war effort and how it compared to an average Eighth Air Force heavy bomber unit.

Methodology

The analysis of the 306th Bomb Group's World War II contributions was conducted in three phases. The first phase was the collection of historic data and statistics on the group. Although several sources were used, the primary source for information was the historic archives of the Air Force Historical Research Agency (AFHRA), located at Maxwell Air Force Base, Alabama. Documents from the AFHRA include actual unit war diaries and unit histories, as well as operational analysis reports. This data formed the foundation of the statistics used to examine the group. Specific statistics were captured on each of the 341 combat missions complete by the 306th.[3] Statistical data collected included: date of each mission, aircraft losses, missions aborted or non-effective, enemy aircraft claimed destroyed, weather conditions over the target, bombing accuracy, bombing method used, location and type of target attacked, presence of fighter escorts, and strength of enemy defenses (enemy fighter aircraft and flak). Appendix A contains a summary of all the data collected on the 306th.

The next phase focused on the Eighth Air Force, collecting data and statistics similar to the data collected for the 306th. Sources for this information included historic operational analysis report and documents from the AFHRA, the United States Strategic

Bombing Survey (USSBS) reports, and various other books and publications on the Eighth Air Force.

Figure 1. Unit Crest for the 306th Bombardment Group (H)[4]

While collecting the data on both the 306th and Eighth Air Force, there were times when complete data on a particular subject was not readily available. In some cases the data was available, but there was not sufficient time to scrutinize the voluminous data and piece together the required information. To overcome these shortcomings, the analysis used one of several approaches. First, some comparisons were made only for the time span of the available data. Second, in some cases, the paper compared qualitative data with quantitative data. For example, data on the 306th's bombing accuracy was provide in the historical reports using terms such as "good," "fair," and "poor," while the statistics for the Eighth Air Force were provided as a numerical percentage of bombs that fell within a specified distance. When collecting data on the Eighth Air Force, some sources presented statistics on heavy bombers (B-17 and B-24), rather than just B-17s. When complete data was not available, as in the cases discussed above, the study only compared the trends found in the two sets of data, thus ensuring a level of validity in the conclusions.

Another consideration when analyzing data from unit histories and unit reports was the accuracy of the data. As in the example of bombing accuracy reports, the reports did not always specify the source of the "good/fair/poor" grades. Depending on the source, the validity of the reports could be questioned. For example, the validity of a report would be considered high, if the accuracy grade was a result of photo-reconnaissance or intelligence reports. However, crews occasionally provided bombing results after visually sighting explosions, fires, or secondary explosions. In these cases, the actually extent of damage to the target may not be completely accurate, or crew bias could affect the accuracy of the report.

The final phase of the research was to analyze the data and draw conclusions. To facilitate the analysis, a series of graphs and tables were generated that compared statistics from the 306th with overall statistics for the Eighth Air Force. These tools were instrumental in providing findings and drawing conclusions. To aid in drawing accurate comparisons and to prevent a comparison of "apples to oranges," data for the Eighth Air Force was normalized. The normalization was accomplished in one of two ways: first, by dividing the Eighth Air Force data by the number of heavy bomber groups assigned in the theater; and second, by presenting data for both the 306th Bomb Group and Eighth Air Force as a percentage of the number of missions or aircraft. The first technique creates a "per group average" for the Eighth, that could be compared to the 306th. Both methods allow comparison on a common basis.

Next, the comparison data for the two units was analyzed for differences and trends. Once a major difference was noted, a search was begun to discover the causes of the

differences. It was in the comparison and search for answers, that the conclusions were drawn.

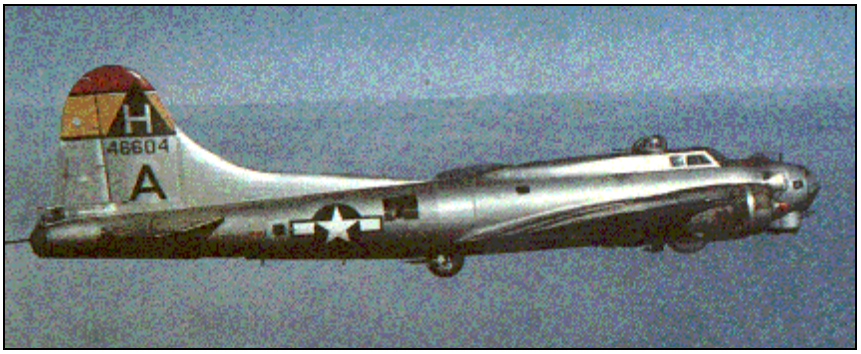

Figure 2. B-17 with "Triangle H" Markings of the 306th[5]

Due to the time intensive nature of researching historic archives, the paper could cover certain areas to the desired depth. In particular, this paper does not cover in depth the reasons for aircraft aborts, the effects of fighter escorts, and the effects of enemy air defenses. Although data on many of these areas was available from the AFHRA, time constraints limited the ability to sift through these massive records.

Notes

[1] Randall Jarrell, *The Complete Poems*, (New York: Farrar, Straus & Giroux, 1969), 145. From the poem "Losses."

[2] Maurer Maurer, ed., *Air Force Combat Units of World War II*, (Washington, D.C.: Government Printing Office, 1983), 179.

[3] Maurer Maurer, ed., *Air Force Combat Units of World War II*, (Washington, D.C.: Government Printing Office, 1983), 179.

[4] Maurer Maurer, ed., *Air Force Combat Units of World War II*, (Washington, D.C.: Government Printing Office, 1983), 179.

[5] Roger A. Freeman, *The Mighty Eighth in Color*, (Stillwater, MN: Specialty Press, 1992), 143.

Chapter 2

In The Beginning

> *From my mother's sleep I fell into the State, And I hunched in its belly till my wet fur froze. Six miles from earth, loosed from its dream of life, I woke to black flak and the nightmare fighters. When I died they washed me out of the turret with a hose.*[1]
>
> —Randall Jarrell

The 306th Bomb Group was activated on 1 March 1942 at Gowen Field, Idaho. From this date until its first mission in the ETO, the group had many challenges and obstacles to overcome.[2] During this early period, the unit faced shortages in training aircraft, poor facilities, a long journey to England, and many logistical problems once at their new home at Thurleigh, just outside Bedford, England.

On 6 April 1942, shortly after the unit was formed, the group moved to Wendover Field, Utah.[3] It was at this location that the group accomplished the bulk of its pre-combat training. However, the 306th began this training with only three B-18s and one A-17 aircraft.[4] By April 1942, the 306th had its first B-17E and the unit had grown to include over four hundred men, one of which was Lieutenant Colonel Curtis E. LeMay—the group's first executive officer.[5] Due to the small number of planes and a growing number of personnel, the unit used these few aircraft around the clock. New trainees were eager to accelerate their training, which was evident by several crew members logging over two hundred flying hours during the month of July. With a total of only three B-17

by July, the ground crews and schedulers were truly challenged.[6] Additionally, a shortage of instructor pilots led to such drastic work-arounds as making instructors out of pilots with only six hours flying a B-17.[7]

Figure 3. 367th Bomb Squadron Patch[8]

Although Lieutenant Colonel LeMay was only in the 306th for a short time, it was time well spent. During his stay, he instituted a program to personally check out each of the new squadron commanders as instrument qualified pilots.[9] In June 1942, LeMay left the 306th to take command of the 305th Bomb Group.[10]

Like many of the bases that were springing up across the United States, Wendover's mission and personnel were growing faster than the facilities and infrastructure could keep up. Initially, the base had only enough housing for the officers to sleep six per room, and the enlisted men were required to sleep in tents. Knee deep mud, cold nights, and snow multiplied the problems with living conditions. Additionally, a lack of buildings forced the four squadrons (the 367th "Clay Pigeons," the 368th "Eager Beavers," the "Fightin Bitin" of the 369th, and the "Grim Reapers" of the 423rd)[11] and group headquarters to share a

small one-room shack. However, a persistent construction program quickly began to ease many of the facility problems.[12]

Figure 4. 368th Bomb Squadron Patch[13]

During these early days, the organization also began to reflect changes. Originally, War Department plans called for the 423rd Bomb Squadron (previously named the 34th Reconnaissance Squadron) to be a B-17 reconnaissance unit. However, the War Department later decided to centralize reconnaissance and design all bomb groups with four bomber squadrons, thus the 423rd became a bomb group.[14]

After these few months of intense training, the 306th prepared for its journey to England. On 1 August 1942, the ground and air crews left Wendover by two separate paths. The ground crews departed Wendover via train to Richmond, Virginia, to receive last minute equipment and refresher training. On 14 August, the ground echelon headed to Fort Dix, New Jersey for more training. Finally, on 30 August, three of the squadrons departed on the *Queen Elizabeth*, cruising across the Atlantic towards their new home. The 423rd Squadron was left behind in quarantine with an outbreak of mumps, and later departed on 4 September aboard the *Queen Mary*.[15]

Life aboard these cruise ships, however, was not a pleasant vacation. The *Queen Elizabeth* had 3,000 to 4,000 beds, but was carrying approximately 16,000 men and equipment, forcing between six and 18 men to be assigned to each room. To ease the situation, the men were divided into two groups and assigned sleeping rotations. Every other day, the groups rotated between sleeping on the sun deck and in the staterooms on the lower decks. Neither rotation was without problems. On the sun deck, the men had to face wind, cold, sea spray, drizzle, and rain, and usually bundled together in odd corners to keep warm. The rotation below decks did not have it much better, contending with warm stuffy quarters that frequently led to seasickness—thus compounding the problems. With great relief, the first portion of ground crews arrived at Thurleigh on 6 September 1942, and the 423rd arrived five days later.[16]

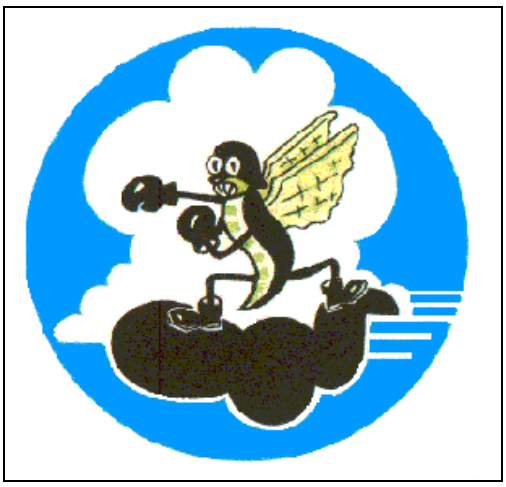

Figure 5. 369th Bomb Squadron Patch[17]

The air echelon experienced their own problems as they departed for England on 1 August 1942. The four squadrons arrived at Westover Field, Massachusetts on 3 August. Once at Westover, the crews spent their time keeping proficient by performing submarine hunting missions over the Atlantic Ocean. The squadrons also took the opportunity to

trade in their E-models for new B-17Fs; however, without the ground crews, the air echelon was forced to perform the aircraft servicing and maintenance tasks for themselves.[18]

Figure 6. 423rd Bomb Squadron Patch[19]

Between 2-4 September, 35 B-17s departed Westover en route to Thurleigh. The first leg of the cross-Atlantic trip ended at Gander, Newfoundland without any major incidents. The next leg of the journey, however, was not as uneventfully.

On 6 September, the 35 aircraft departed Gander, but only 33 made it to England. Due to the extremely long flight, the aircraft were fitted with 800-gallon bomb bay tanks that were switched on electrically. After seeing a bright flash in the sky, the remaining crews reported the loss of the first B-17, probably due to an electrical short that caused the bomb bay tank to explode.[20]

The second B-17 to be lost experienced engine problems early in the flight and was forced to feather the engine. The added strain on the remaining three engines led to increased consumption of the already limited fuel supply. Still over the Atlantic, the aircraft lost another engine, which intensified the fuel problems. Unable to make it to

land, the pilot ditched the aircraft in shallow water off the coast of Ireland—close enough to walk to shore. Although the tide later washed away the B-17, all of the crew survived the ordeal. After a brief stay at Prestwick, Scotland, the air echelon finally arrived at Thurleigh on 13 September 1942.[21]

Now that the 306th Bomb Group was in England, it began to experience a new set of logistics and training challenges. Although a Polish squadron previously occupied the base, the preparations and construction for the much larger American bomber group were not complete. Throughout the first six months at Thurleigh, the group watched the progress of the construction. Improvements were made to the runways, sewage, electrical system, facilities, water storage and fuel storage. Limited facilities required as many as eight hundred men to be housed in tents, and the mess hall to operate on a 24-hour/three-shift operation, while waiting for construction to be completed.[22]

Other challenges facing the unit included various aspects of adjusting to life and operations in England. The 306th personnel had to adapt to things as simple as the British money exchange and understanding the "King's English," to becoming proficient at British radio and flying procedures. After hectic days of intensive training and assistance from the British bomber crews, the 306th Bomb Group was declared mission ready and fully operational on 28 September 1942.[23]

Notes

[1] Randall Jarrell, *The Complete Poems*, (New York: Farrar, Straus & Giroux, 1969), 144. From the poem "The Death of the Ball Turret Gunner."

[2] Maurer Maurer, ed., *Air Force Combat Units of World War II*, (Washington, D.C.: Government Printing Office, 1983), 179-80.

[3] Maurer Maurer, ed., *Air Force Combat Units of World War II*, (Washington, D.C.: Government Printing Office, 1983), 179-80.

Notes

[4] Russell A. Strong, *First Over Germany: The Story of the 306th Bombardment Group*, (Winston-Salem, NC: Hunter Printing Co., 1990), 10.

[5] Captain William C. Van Norman, First Lieutenant Dwain A. Esper, and Corporal Arthur P. Bove, *History of the 306th Bombardment Group (H)*, GP-306-HI, in USAF Collection, AFHRA, 2.

[6] Captain William C. Van Norman, First Lieutenant Dwain A. Esper, and Corporal Arthur P. Bove, *History of the 306th Bombardment Group (H)*, GP-306-HI, in USAF Collection, AFHRA, 4.

[7] Russell A. Strong, *First Over Germany: The Story of the 306th Bombardment Group*, (Winston-Salem, NC: Hunter Printing Co., 1990), 15.

[8] Russell A. Strong, ed., *1994 Directory: 306th Bomb Group Association*, (Charlotte, NC: 306th Bomb Group Association, 1994), cover.

[9] Russell A. Strong, *First Over Germany: The Story of the 306th Bombardment Group*, (Winston-Salem, NC: Hunter Printing Co., 1990), 15.

[10] Captain William C. Van Norman, First Lieutenant Dwain A. Esper, and Corporal Arthur P. Bove, *History of the 306th Bombardment Group (H)*, GP-306-HI, in USAF Collection, AFHRA, 3.

[11] Maurer Maurer, ed., *Combat Squadrons of the Air Force: World War II*, (Washington, D.C.: Government Printing Office, 1969), 454-57, 519-20.

[12] Captain William C. Van Norman, First Lieutenant Dwain A. Esper, and Corporal Arthur P. Bove, *History of the 306th Bombardment Group (H)*, GP-306-HI, in USAF Collection, AFHRA, 2.

[13] Russell A. Strong, ed., *1994 Directory: 306th Bomb Group Association*, (Charlotte, NC: 306th Bomb Group Association, 1994), cover.

[14] Russell A. Strong, *First Over Germany: The Story of the 306th Bombardment Group*, (Winston-Salem, NC: Hunter Printing Co., 1990), 14.

[15] Captain William C. Van Norman, First Lieutenant Dwain A. Esper, and Corporal Arthur P. Bove, *History of the 306th Bombardment Group (H)*, GP-306-HI, in USAF Collection, AFHRA, 4-5.

[16] Arthur P. Bove, *First Over Germany: A Story of the 306th Bombardment Group*, (San Angelo, TX: Newsfoto Publishing Co., 1946), 2.

[17] Maurer Maurer, ed., *Combat Squadrons of the Air Force: World War II*, (Washington, D.C.: Government Printing Office, 1969), 456.

[18] Captain William C. Van Norman, First Lieutenant Dwain A. Esper, and Corporal Arthur P. Bove, *History of the 306th Bombardment Group (H)*, GP-306-HI, in USAF Collection, AFHRA, 5.

[19] Russell A. Strong, ed., *1994 Directory: 306th Bomb Group Association*, (Charlotte, NC: 306th Bomb Group Association, 1994), cover.

[20] Russell A. Strong, *First Over Germany: The Story of the 306th Bombardment Group*, (Winston-Salem, NC: Hunter Printing Co., 1990), 22-27

[21] Russell A. Strong, *First Over Germany: The Story of the 306th Bombardment Group*, (Winston-Salem, NC: Hunter Printing Co., 1990), 22-27.

Notes

[22] Russell A. Strong, *First Over Germany: The Story of the 306th Bombardment Group*, (Winston-Salem, NC: Hunter Printing Co., 1990), 27-28.

[23] Russell A. Strong, *First Over Germany: The Story of the 306th Bombardment Group*, (Winston-Salem, NC: Hunter Printing Co., 1990), 28-30.

Chapter 3

Contributions and Analysis

> *…Then I heard the bomber call me in: "Little Friend, Little Friend, I got two engines on fire. Can you see me, Little Friend?" I said "I'm crossing right over you. Let's go home."* [1]
>
> —Randall Jarrell

The examination of the 306th Bomb Group was divided into four time periods. The first period covers October 1942 to April 1943 and focuses on the growing pains and lessons learned from the early missions. The second period, May 1943 to January 1944, looks at the initial impacts of Operation POINTBLANK, the codename for Combined Bomber Offensive (CBO). In particular, the analysis of this period examined the role assigned to the Eighth Air Force for gaining air superiority in support of the invasion of France and destroying Germany's capability to wage war.[2] The next period covered the Operation ARGUMENT timeframe (February to June 1944). ARGUMENT was the codename of the operation designed to increase *Luftwaffe* losses by not only attacking aircraft production, but also destroying German fighters in the air and on the ground.[3] The final time period examined was the interval from D-Day to the end of the war in Europe, July 1944 to April 1945.

The First Missions (Oct 42-Apr 43)

The early bomber missions of the Eighth Air Force can be characterized as high-level daylight missions to strike relatively close targets within France and Germany, such as submarine facilities, marshalling yards, airfields, and aircraft production.[4] During many of these missions, the B-17s were either completely unescorted or only partially protected by escorting fighters.[5] The early period of the war also involved much experimentation with bombing techniques and tactics, primarily aimed at proving the Air Corps Tactical School's (ACTS) theory of high altitude unescorted daylight precision bombing of the enemy's industrial web.[6] Therefore, the question to be answered is whether the 306th contributed to proving/disproving the ACTS bombing theory, as well as, to examine the contributions to the overall success of the war efforts.

The analysis used two criteria to examine the effectiveness of ACTS theory. First, was the 306th successful at bombing and destroying the enemy targets? This criteria was judged by the group's ability to get through to the target and the have their bombs land in the target area. Second, were the losses to the 306th acceptable? Based on B-17 production rates at the time, we will assume losses totaling 5% or less to be acceptable and over 10% as unacceptable.[7] If these two criteria are both adequately met, than we could assume that the high altitude, daylight, unescorted, and precision portions of ACTS theory would be valid. However, since a proof of the industrial web theory is beyond the scope of this paper, we will assume that the targets selected under the web theory were valid. If interested in this subject, readers should refer to the comprehensive—200+ volume—reports of the USSBS for an in-depth study on the effectiveness of the strategic bombing of Germany's industrial web.

Reaching the Target

During this early period of the war the 306th flew 35 missions, primarily striking submarine facilities, marshalling yards, and industrial targets. At the end of the 35 missions, the group had lost 35 of their aircraft, or 7.6% of their 461 effective sorties. Comparing this to the Eighth Air Force, we found the Eighth lost 131 heavy bombers in the ETO, which accounted for 5.7% of their effective sorties.[8] Although the losses for the 306th were higher than the Eighth during this period, the difference is not large—but it was the worst in the Eighth Air Force.[9]

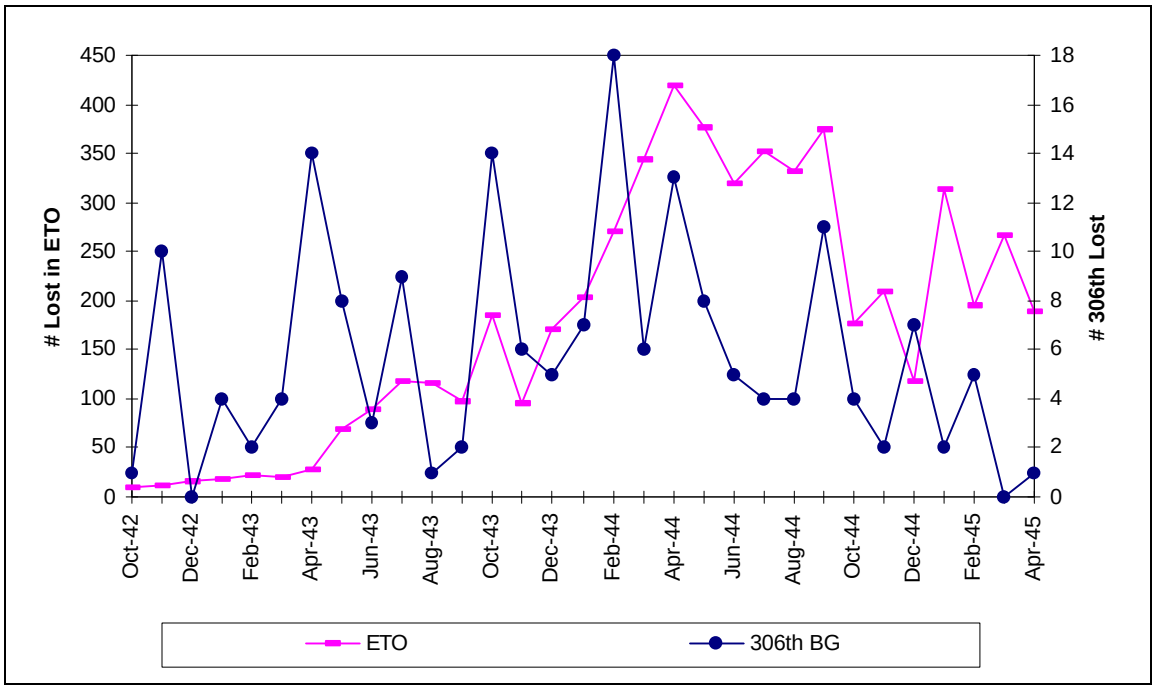

Figure 7. Comparison of Number of Aircraft Losses[10]

From the perspective of losses, neither the 306th nor the Eighth Air Force could conclusively prove the effectiveness of the daylight bombing strategy. However, there were several lessons learned and initiative instituted during this period that led to improvements to the loss rates.

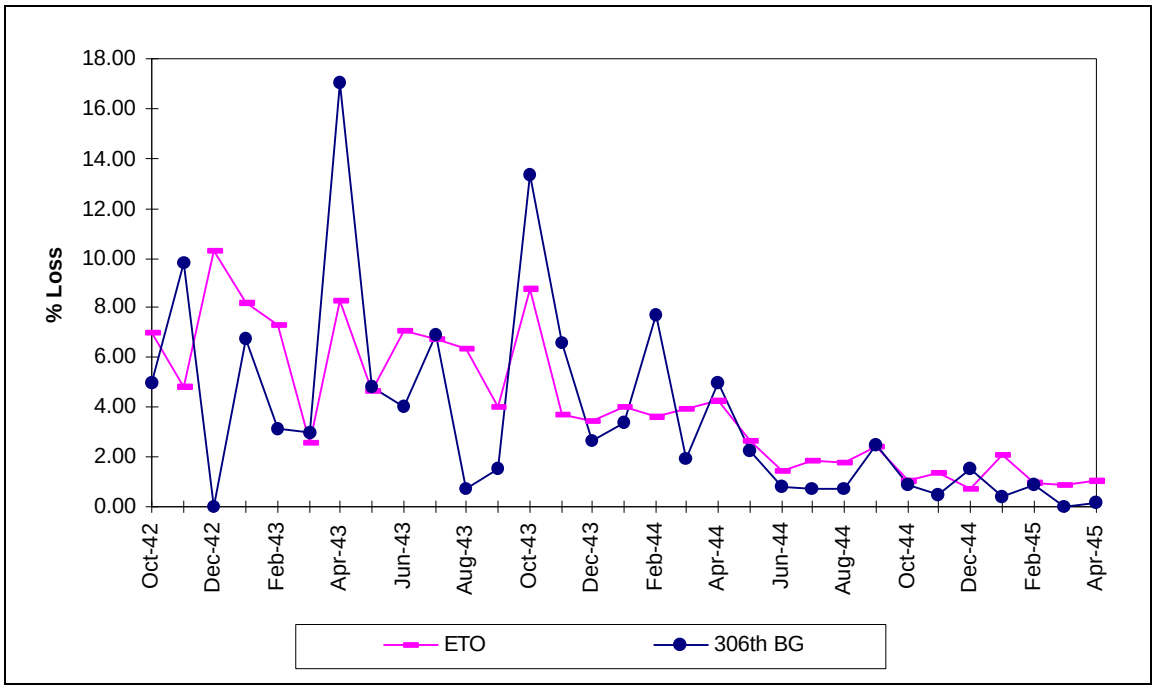

Figure 8. Comparison of % Losses[11]

Several factors contributed to the high loss rates suffered throughout the Eighth Air Force, in the early phase of the war. Probably the most significant factor was the insufficient protection by fighter escorts. Although the British Bomber Command had warned the Americans of the heavy losses (18%) suffered during daylight missions, the Americans remained convinced that the bombers could get through.[12] In *To Command the Sky*, Stephen McFarland and Wesley Newton stated that by May 1943 heavy bombers suffered an average loss rate of 7% without fighter escorts, but only 1.6% when under complete fighter escort.[13] Unfortunately, from October 1942 to April 1943, there was only one fighter group assigned to the Eighth Air Force to provide escort.[14] However, the VIII Bomber Command was slow to see the need for fighter escorts, and the bombers would not see the full advantage of escorts until 1944.

A very risky but effective technique was employed on several occasions by Lt William J. "Wild Bill" Casey. If he noticed a damaged B-17 being attacked by enemy aircraft,

Lieutenant Casey would fall out of formation to distract the attacking German fighters. This tactic was effective, but on 17 April 1943, Lieutenant Casey was shot down over Bremen and spent the remainder of the war in *Stalag Luft 3*.[15]

Some of the miscellaneous improvements included the development of a .50-caliber nose gun mounts, methods to improve medical treatment for returning crews, bomb fusing techniques, and more efficient maintenance techniques. The new gun mount allowed pilots to fire machine guns at enemy aircraft attacking head on. Due to the success of the nose guns, the new mount was adopted for use throughout the Eighth Air Force and led to the inventors receiving a Legion of Merit medal.[16]

One of the medical initiatives resulted in a procedure to identifying returning aircraft that had wounded members on board, by firing color coded flares. The second medical improvement came from a redesigning the RAF stretcher to make it easier to remove wounded members from any part of the aircraft.[17] Both efforts greatly improved medical response for injured crews and probably resulted in saving lives.

Another effort that led to a Legion of Merit was the development of a method to fuse bombs after they were loaded on the aircraft. The new method was so effective at reducing risk to load crews that it was adopted by all of the bomber groups.[18] Other resourceful ideas such as the cannibalization methods adopted by the maintenance personnel were important for keeping the aircraft flying. In fact, cannibalization was so prevalent that there are stories of planes slowly disappearing as they were devoured of parts to keep other bombers in the air.[19]

Bombing Accuracy

A review of bombing results found in the 306th's historical war diaries indicated only nine of the 35 missions returned with "good" results (the other 25 were shown as follows: 15 poor, 4 fair, 6 aborts, and 1 unknown).[20] However, the Eighth Air Force did not fare much better. Army statistics for the first quarter of 1943, showed only 18% of the bombs dropped by the Eighth's heavy bombers landed within one thousand feet of the pre-assigned main point of bomb impact (MPI) and only 36% within two thousand feet.[21]

Overall, the bombing results were poor; and based on the criteria for bombing effectiveness, the ACTS theory was not conclusively proven. But once again, the 306th was a major player in developing solutions and discovering lessons.

Training and tactics were two factors that affected both losses and bombing accuracy. During the early months, the 306th commander was vocal on his belief that training being conducted back in the states was poor, and that the training within England was inefficient. Due to the poor weather conditions in England, lack of adequate gunnery/bombing ranges, and limited airspace, Col Charles B. Overacker, the first commander of the 306th, believed the answer was to enhance training in the US. However, General Eaker removed him from command after word of Colonel Overacker's criticism reached VIII Bomber Command Headquarters. Unfortunately for Colonel Overacker, shortly after he was removed from command, the Army Air Force subsequently implemented his idea and performed most of the aircrew training in the US.[22]

Maj Gen Ira Eaker, commander of the VIII Bomber Command, also had other reasons for replacing Overacker. Although the 369th Bomb Squadron had achieved the incredible record of completing 42 missions without a single aircraft loss (a record that

was not surpassed until after D-Day)[23], the group's overall record was below par. At the same time the 369th was achieved notoriety, the ill-fated 367th Bomb Squadron had earned the nickname the "Clay Pigeons," because they had suffered the highest losses of any unit in the Eighth Air Force. General Eaker believed Colonel Overacker was too attached to his crews and, therefore, lacked the necessary "military propriety" and discipline.[24] In order to allow the 306th to recuperate and focus on training, the group was taken off combat status during December 1942 and given a new commander.[25]

Following this brief rest, Colonel Overacker's successor arrived in the unit. Brig Gen Frank A. Armstrong took command of the group and the task of improving the group's record. Although a fictional account, the movie *Twelve O'clock High* is roughly based on General Armstrong's efforts to successfully rejuvenate the 306th Bomb Group.[26]

Another initiative developed during this period was the wing-sized combat box formation. Although Colonel LeMay, then commander of the 305th Bomb Group, and Brig Gen Laurence S. Kuter, commanding general of the 1st Bomb Wing,[27] were the key developers of the formation, it was the 306th and the other units of the 1st Bomb Wing that performed the test missions to validate the concept.[28] The combat box went on to be one of the primary formations used throughout the war, due to its characteristics for improving accuracy and protecting the formation.

Unlike the combat box, there were several other techniques that were tested but never adopted. During October 1942, the group flew several training missions to test the feasibility of low-level "hedge hopper" bombing. Despite losing an aircraft during the training missions, an operational test was conducted on 9 November 1942 with the 306th flying at low-levels to attack the St. Nazaire submarine pens. As a result of this mission,

the group lost three aircraft to accurate flak batteries, and the Eighth Air Force avoided future disasters from low-level techniques.[29]

Conclusion

Despite the heavy losses and inaccuracies in bombing, the 306th and Eighth Air Force remained confident that they had proven the ability of the bombers to fly in daylight, penetrate through the heaviest German defenses, and drop their bombs on the targets.[30] Although daylight bombing had not been conclusively proven during this early period, the 306th had demonstrated they could improve their results and become more effective as the war progressed.

Early POINTBLANK (May 43-Jan 44)

The POINTBLANK operations, conducted between May 43 and D-Day, were carried out to secure air superiority in support of the OVERLORD invasion of Normandy. Approved at the January 1943 Casablanca Conference, POINTBLANK became the more commonly known Combined Bomber Offensive. General Eaker focused the efforts of POINTBLANK on bombers, believing that a force of three hundred bombers could attack any target within Germany with less than 4% losses.[31] However, Gen Henry "Hap" Arnold, Chief of the Air Corps, also saw the important role of fighter aircraft in the operation.[32]

The questions to be examined for this period are: Did the 306th contribute to achieving the goals of POINTBLANK, and how did the 306th compare with the Eighth Air Force? To answer this question, the analysis will primarily consider two aspects: the

bombers' ability to reach the target and the accuracy of the bombing—assuming again that the selected targets were appropriate.

Reaching the Target

To analyze the ability to reach the targets, we will look at aircraft losses. During the entire period of May 1943 to January 1944, the Eighth Air Force lost 1,148 heavy bombers.[33] While this number is much higher than during the previous period, as a percentage these losses were much lower, representing a 4.9% loss rate—0.8 percentage points less than the previous period. During the same timeframe, the 306th achieved a 4.49% loss rate—an incredible 3.1 percentage point reduction from the previous period.[34] This is a significant accomplishment because the group not only improved its record from having the highest loss rate, but actually achieved a figure lower than average Eighth Air Force rate. The reason for this feat is most likely due to the training and discipline initiatives established by Gen Armstrong. Additional factors for the accomplishment could be the improved tactics implemented during the period, such as increasing emphasis on fighter escorts.

While on the surface, the loss rates appear to have improved, there were several missions that resulted in very unacceptable and even devastating losses. Initially, emphasis on long-range fighter escorts was slow[35] to become a priority, but after the infamous losses during the Blitz Week operations and over Schweinfurt, unescorted bombing was no longer considered practical.[36]

During the Blitz Week of 24-30 July 1943, the POINTBLANK operations focused on attacks against German airfields and aircraft industry, launching over one thousand bombers to strike 15 targets. Although bombing of the targets could be considered

successful, the force suffered a 10% loss rate.[37] In comparison, the 306th's loss of 9 of its 70 B-17s attacking the industrial targets representing almost 13% of their attacking force.[38]

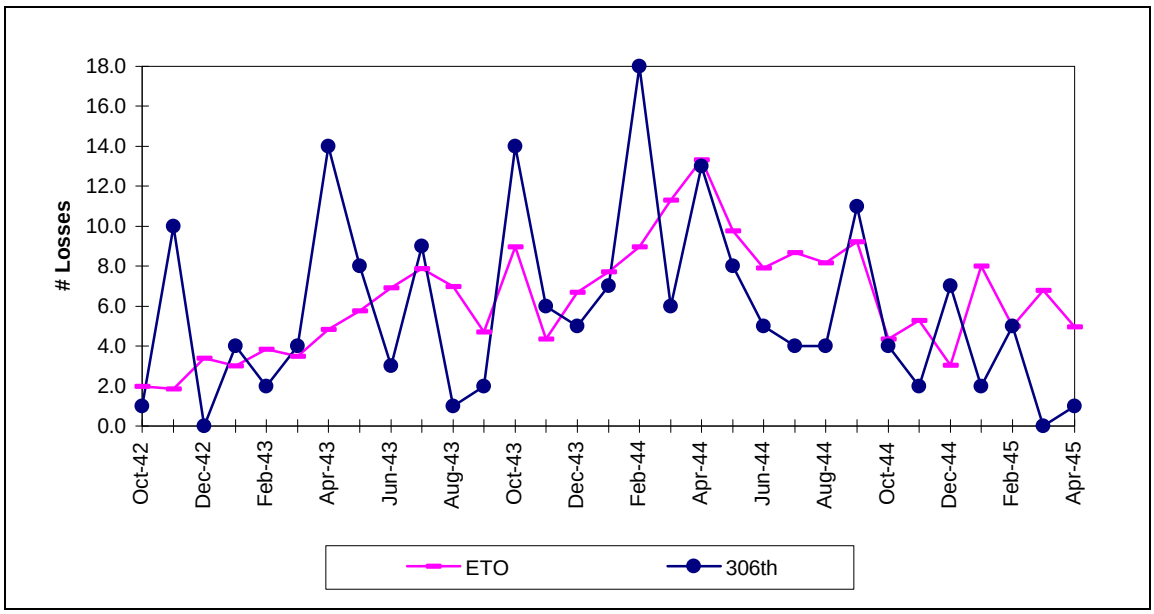

Figure 9. Normalized Comparison of Losses[39]

The two missions to Schweinfurt on 17 August and 14 October 1943 led to Eighth Air Force losses of over 19% and 26%, respectively.[40] The records of the 306th Bomb Group, however, sharply contract those of the Eighth Air Force. On the 17 August raid, the 306th successfully completed the mission without losing a single aircraft! At the other extreme, however, the 306th lost 10 of their 18 aircraft during the second visit to Schweinfurt—a disastrous 55% loss rate![41]

While there is no clear rationale for the extreme differences in 306th's loss rates, there are several factors that could provide possible insight. One factor would be the unit's position in the formation. In a combat box formation, the lead bombardier would aim the bombs for the entire formation, and enemy aircraft tended to attack the lead elements of a formation in an attempt to throw off the bombing results. The lead bombardier technique

was an effective method for minimizing the number of bombardiers requiring the advanced training need to accurately drop bombs and also reduced demand on the already limited supply of Norden bombsights.[42]

Another factor that could have an effect on losses is the altitude of a unit within the formation. If the enemy set their flak to explode at a certain altitude, units above or below that altitude would suffer few losses. However, an VIII Bomber Command report on battle damage during 1942-43 pointed out some interesting statistics. The report indicated that although flak damage was more frequent, it was less severe. On the other hand, damage from enemy aircraft was less frequent, but caused more than 3 ½ time as much serious damage.[43]

Bombing Accuracy

Like losses, bombing results during the POINTBLANK period also improved. At the beginning of the period, approximately 12% of bombs dropped by the Eighth Air Force fell within one thousand feet of the aiming point, but by January 1944, the figure rose to between 35[44] and 50%.[45] Looking at the 306th, the records show the following results for the 69 missions conducted during this period: 17 poor, 9.5 fair, 16.5 good, 5 unknown, 6 abort, and 15 by Pathfinder (PFF).[46] Although still not good, the results were an improvement over the previous period. The PFF bombing technique, mentioned above, involves the use of radar to navigate and locate targets. In particular, PFF (sometimes called "Mickey") refers to the use of the H2X radar,[47] which was an early ground imaging radar first installed on Eighth Air Force B-17s in November 1943.[48]

Radar bombing techniques were intended to improve accuracy of bombing and to allow bombing during poor weather conditions. However, results of the USSBS indicate

that radar bombing did allow bomber to attack during poor weather conditions, but visual bombing was more accurate than radar bombing. Accuracy of visual bombing within the ETO actually improved between January 1943 and May 1945. Although very inaccurate, the radar bombing techniques had an added benefit of providing the bombers with more protection from enemy defenses,[49] and decreasing the amount of aircraft weather aborts.[50] According to Stephen McFarland, a bomber crew's chance of returning safely from a radar bombing mission was six times higher than that of a visual bombing mission. Radar bombing also allowed the Americans to drop an additional 195,000 tons of bombs that would not have been dropped if good visual conditions were required.[51]

Conclusion

From our analysis of operations during POINTBLANK and the two criteria (the bombers' ability to reach the target and the accuracy of the bombing), we can conclude that the improved record of the 306th contributed to the progress and slow successes of POINTBLANK. Although, the air forces continued to refine their tactics and improve performance, the allies had not yet achieved the goal of POINTBLANK—air superiority over Germany. By applying the lessons from this period and taking advantage of the more efficient crews, the allied air forces decided to initiated an operation to accelerate the race for air superiority—Operation ARGUMENT.

The ARGUMENT Period (Feb 44-Jun 44)

The goal of ARGUMENT was to destroy the German aircraft industry in pursuit of POINTBLANK's objective of reducing the *Luftwaffe* fighter forces prior to OVERLORD, and if weather prevented attacks on the industry targets, Berlin was to be bombed.

However, the destruction of Germany's aircraft production was not enough to ensure the success of ARGUMENT: operational German fighters would also have to be destroyed.[52] To destroy these operational fighters, however, the *Luftwaffe* would have to be baited into the air. In order to accomplish this task, Gen Carl Spaatz, commander of the United States Strategic Air Forces in Europe (USSAFE), decided to lure the *Luftwaffe* with American bombers over a target that was so dear to the Germans that they would have to send fighters to defend it—that target was Berlin.[53]

To analyze the 306th's role during this period, I again considered two criteria for achieving the goals of ARGUMENT. First, I examined the ability to reach the target with acceptable losses. This examination will focus on the losses, causes, and tactics implemented to reduce losses. Next, I analyzed bombing accuracy, and effectiveness of new techniques.

Reaching the Target

During the five months represented in this period, the 306th participated in 83 missions that included 1787 sorties. The missions primarily bombed airfields, German industry, V-Weapons sites, tactical targets, and transportation sites. Of these sorties, the 306th lost 50 aircraft for a 2.79% loss rate,[54] which compares very closely to the Eighth Air Force's 2.75%.[55]

Although the overall loss rate was low, there were still several missions that had excessive losses. One such occasion was during Big Week, the intensive week-long operation that "kicked off" ARGUMENT.[56] During this week, 20-25 February 1944, the 306th flew one hundred effective sorties and lost 13% of the aircraft.[57] On one of these missions, the group lost a ghastly 24% of their aircraft. The mission, on 22 February, was

to an aircraft manufacturing facility at Bernburg, Germany. The 306th provided 39 B-17s (10 of which later aborted prior to reaching the target) to attack target, and 29 aircraft successfully reached the target, achieving excellent bombing results. However, shortly after departing the target the group lost their P-51 escort, and 20 Bf 109s attacked the formation. The formation was later rescued by two P-51s, only to have their "little friends" disappear again. This time 30 FW 190s attacked, devastating the entire left side of the lead group's formation. In the end, the 306th lost seven aircraft and 23 others were damaged.[58] These heavy losses again highlighted the problem of unescorted bombers.

In comparison, the Eighth Air Force conducted over twenty-five hundred Big Week sorties and had three hundred bombers either destroyed or damaged beyond repair. Although the losses to American bombers were very high, the German fighters destroyed during the operation provided a small degree of success. By drawing the *Luftwaffe* into the air, the attrition to German fighters was now out pacing their production of pilots. It is also noteworthy that the tonnage of bombs dropped in this one week was more than the amount dropped during all of 1943.[59] Overall, the Eighth lost 2.75% of their bomber force during the entire ARGUMENT period.[60]

The success of ARGUMENT was achieved through a snowballing effect of each aerial victory. As the allies destroyed more German fighters, it became safer and easier for American bombers to successfully reach their targets—therefore, destroying more enemy aircraft. By the end of ARGUMENT, the air forces had achieved air superiority in time to support the allied invasion at Normandy. Several initiatives implemented prior to and during ARGUMENT had a major impact on the success of the operation. Apart from the

snowball effect described above, long-range fighter escorts and chaff had a significant effect on the outcome of ARGUMENT.

Chaff, known as "window" by the British, consisted of thin strips of aluminum foil, that when dropped from an aircraft would confuse enemy radar. The historical records for the 306th state on numerous occasions that crews attributed the inaccuracy of flak batteries to the use of chaff.[61] As more *Luftwaffe* fighters were destroyed, the main threat facing allied bombers now came from flak, and the use of chaff became more important. Radar bombing through cloud cover provided an additional level of protection to the bomber crews.

However, the most effective protection for the heavy bombers probably came from the long-range fighter escorts, and by February 1944, the Eighth Air Force began to see an increase in long-range escorts.[62] To ensure the effective use of limited long-range escorts, General Doolittle's (commander of the Eighth Air Force) 8 February order required "all qualified P-51 pilots to fly escort missions, regardless of all but the highest rank or responsibility." Additionally, General Doolittle arranged to borrow P-51s from the Ninth Air Force if enough aircraft was not available for each trained pilot.[63]

Bombing Accuracy

Although complete statistics on the 306th's bombing accuracy were not readily available for this time period, the available data was used to compare with the data for the Eighth Air Force. Of the 83 missions flown by the 306th, their unit historical reports contained remarks on bombing results for only 35 of the missions. Looking at only these 35 missions, the records show 30 had good or excellent results, two fair, and three unknown. Additionally, 24 of the missions that did not have entries for bombing results

were PFF radar bombing missions.[64] As stated earlier, the accuracy of radar bombing techniques was extremely low. The USSBS claims that bombing done under good visual conditions actually produced 150 times as many bombs within one thousand feet of the aiming point as with H2X.[65]

Examining the statistics for the Eighth Air Force, the data remained relatively constant throughout the period—beginning and ending the period with 40% of the bombs landing within one thousand feet of the MPI.[66] Data for the Eighth also indicate the 1st Bomb Division (the 306th was one of 12 groups assigned under the 1st Bomb Division)[67] began the period at 42% and by June 1944 achieved 49%. Considering both the statistics for the Eighth Air Force and the 306th, we can assume overall bombing was fairly accurate, except for those missions performing radar bombing.

Conclusions

From the data analyzed during the ARGUMENT period, we can conclude that the 306th and Eighth Air Force were successful at achieving the stated goals. The use of heavy strategic bombers to strike tactical targets, also contributed significantly to the success of the Normandy invasion, by striking heavy gun emplacements, troop concentrations, and interdicting supplies.[68] A clear testament to the success of the operation is seen in the fact that Germany had only 80 serviceable fighters and over three hundred total aircraft in the area, to counter the Americans' eighteen hundred bombers and nine hundred fighters. Additionally, on the day of the invasion, only two German aircraft were able to penetrate the beachhead, with insignificant results.[69] Having successfully achieved air superiority and established a foot-hold on the Normandy coast, the allies were now prepared to move on to victory.

On to Victory (Jul 44-Apr 45)

Having achieved air superiority prior to D-Day, the post-invasion air objectives were to focus on those targets that would assist the ground war and continue to maintain air superiority. To meet this objective, the targets most heavily bombed included marshalling yards, oil production, transportation, airfields, and tactical targets. Although the allies had seized control of the air, their aircraft would not be completely safe while striking the German targets.

Reaching the Target

Although the loss rates for both the Eighth Air Force and the 306th Bomb Group decreased steadily throughout the war, the actual number of heavy bombers lost increased sharply up to D-Day—decreasing only slightly through the end of the war. The reason for this increase in number lost is due primarily to German flak. For the four periods of the war, the numbers of heavy bombers lost to flak are provide below.

Table 1. Flak Losses[70]

Period	# Lost to Flak	Total Lost	% of losses to Flak
Oct 42-Apr 43	1	131	0.8
May 43-Jan 44	254	1148	22.1
Feb 44-Jun 44	582	1732	33.6
Jul 44-May 45	1602	2535	63.2

From the Table 1, we can see that as air superiority was gained the threat from enemy aircraft decreased, but the threat from flak grew. Although the number of losses grew, the

percentage lost decreased consistently during the last phase of the war—0.76% for the 306th Bomb Group[71] and 1.4% for the Eighth Air Force.[72]

The reasons for the drop in loss rate could be attributed to several factors. First, the serious decrease in enemy fighters had a major impact on reducing the losses. This lack of enemy fighters became so apparent by the end of the war that some gunners actually completed their 35 combat missions without ever firing their guns in combat.[73] As another example, the 306th historical records pointed out that the "enemy fighter interceptors were conspicuous by their absence."[74]

The use of chaff and new tactics also help explain the improved loss rates. Reports from the 306th indicated a new tactic in the use of chaff—a screening force that dropped chaff over the target in advance of the bomber formation.[75] Other reports indicated the British assisted in these efforts, by flying Mosquitoes as the chaff screen force.[76] Screening forces of fighter aircraft would be more effective, because they could drop the chaff and take evasive maneuvers that a formation of B-17 could not do once on the final bomb run.

On 19 October 1944, the 306th was tasked to fly a test mission at the Royal Aircraft Establishment at Farnborough, to test the effects of chaff on a captured German radar set. During the test, the 306th aircraft dropped chaff and tested a maneuver called the "Razzle Dazzle" technique. From the reports, I believe this technique involved taking evasive banking maneuvers following the release of chaff. The 306th later used the "Razzle Dazzle" method on an operational mission. During the 26 October mission to strike the ordnance storage depot at Bielefeld, Germany[77], 12 B-17s from the 306th provided the screening force and used the "Razzle Dazzle" method, reporting good results.[78]

There are also indications of experiments with different formations, in particular a 10-aircraft squadron formation. The reports did not give specifics on the reasons for the new formation, nor did it give the results[79]. However, it is assumed the changes were being made to either reduce losses or, more likely, to improve bombing accuracy.

Bombing Accuracy

In addition to the use of new formations, there were several radar developments at the end of the war that were intended to improve bombing accuracy. These systems included Gee[80], Oboe[81], Gee-H[82], and Micro-H[83], all of which were ground-based beacon systems developed by the British. Although the intent of these radar systems was to improve bombing accuracy, they were never able to achieve results as good as the visual bombing technique. The USSBS states, "bombing done under good visual conditions produced six times as many bombs within one thousand feet of the aiming point as Micro-H and Gee-H."[84]

Historical records indicated the Eighth Air Force visual bombing accuracy improved during the period. The period began with 37% of the bombs dropped falling within one thousand feet of the MPI. By April 1945, the Eighth had achieved 59% of the bombs within one thousand feet, and the 1st Bomb Division achieved 64%.[85]

Although never implemented, the allies had experimented with several other techniques. Two such examples are an "optical filter for conventional bombsights and the use of a pilot aircraft flying below the overcast, controlling a bomb-carrying aircraft flying in or above the overcast."[86]

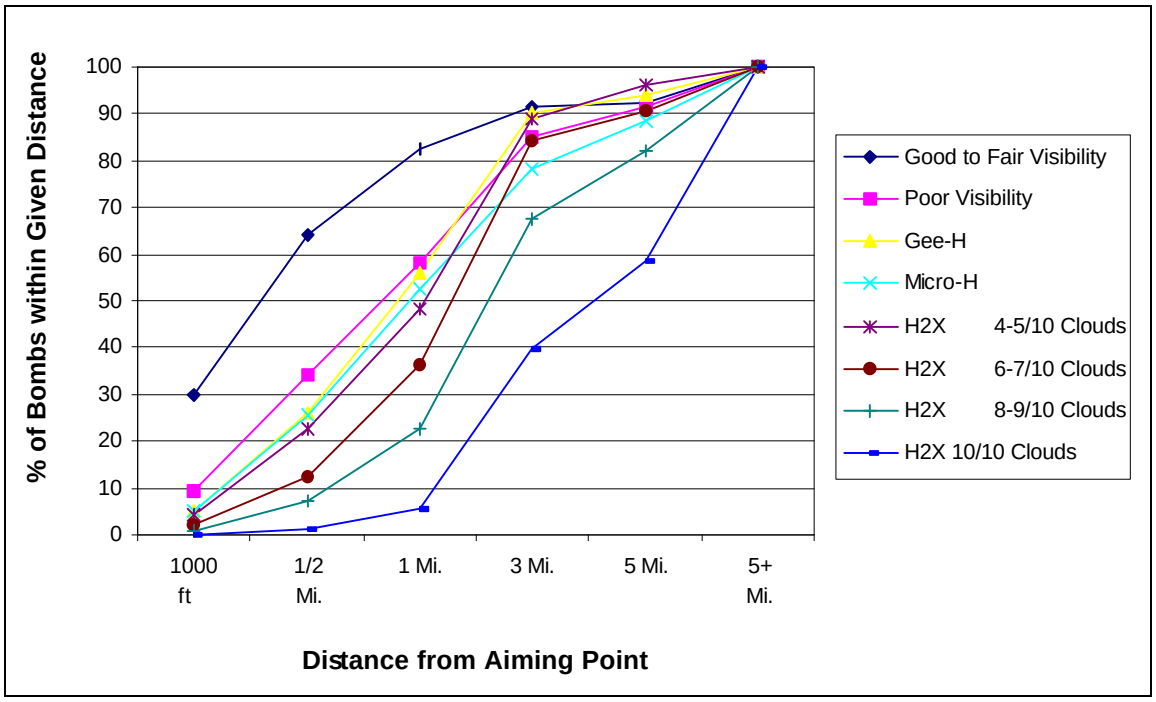

Figure 10. Accuracy of Bombing Techniques for Eighth Air Force[87]

During tactical missions in support of ground troops, the bomb groups took great efforts to improve their accuracy and prevent fratricide. Between 9-21 November 1944, the 306th provided tactical support to the ground forces fighting their way into Germany. To protect ground troops from friendly fire, techniques involving flares, balloons, radar, and artillery barrages were employed. The balloons and artillery barrages were used from the ground to indicate the friendly line. In the air, crews used the SCS-51 radar to pick-up the friendly line, and once inside enemy territory the lead bomber would drop flares to notify the rest of the formation. These techniques appeared to be very effective, because in his 19 November letter, Gen George Patton, commander of the Third Army, praised the results of the bomber crews.[88]

Conclusions

As the war progressed to an end, the statistics discussed above paint a picture of improved bombing, decline in aircraft loss rates, and minimal threat from enemy fighters. However, it is also important to remember that there were still large numbers of aircraft and crews being lost. Although enemy aircraft were seldom seen in the last months, reports stated that on the few times the enemy did attack, it was intense.[89] Morale levels during this time were very mixed. Many personnel were confident that the war would be over before Christmas, but that did not happen. Anxiety was also high after mission orders began tasking the bombers to go back to the "Big-B"—Berlin.[90] After months of shorter sorties and minimal aerial threat, the crews were going back to one of the most heavily defended areas in Germany. The effect of the unsteady morale was apparent from the reports of a young enlisted man that committed suicide on 8 September 1944.[91]

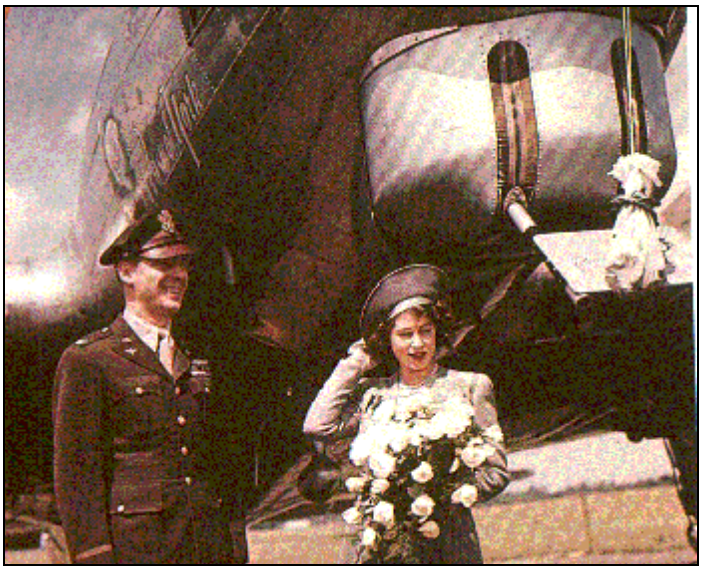

Figure 11. Princess Elizabeth Christening "The Rose of York"[92]

There were, however, a few positive and interesting events that occurred during this final period of the war. On 6 July 1944, Thurleigh and the 306th had a very important

visitor—a young Princess Elizabeth of England. The occasion was the naming of a B-17 for the Princess, "The Rose of York." Also attending the ceremony was King George and Queen Elizabeth.[93]

An interesting mission came to the 306th on 22 July 1944, two days after the failed assassination plot against Adolf Hitler. The mission for this day was to drop leaflets (called "nickel" by the aircrews) to inform the Germany citizens of the plot. This early psychological operation (PSYOP) mission was conducted to ensure the Germans would get the real story and perhaps even build support for rebellion against the Nazi government.[94]

On 19 April 1945, the 306th Bomb Group flew its last combat mission.[95] Since the allies now controlled a major portion of the German territory and industrial facilities, there was no longer a need to continue the strategic bombing campaign—and the allied victory was in sight. This final phase of the war, demonstrated how overall victory is more easily achieved, once victory has been won in the air.

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[40] Stephen L. McFarland and Wesley Phillips Newton, *To Command the Sky: The Battle for Air Superiority over Germany, 1942-1944*, (Washington, D.C.: Smithsonian Institution Press, 1991), 128.

[41] *Monthly War Diary*, GP-306-HI, in USAF Collection, AFHRA, Aug 43, Oct 43.

[42] Stephen L. McFarland, *America's Pursuit of Precision Bombing, 1910-1945*, (Washington, D.C.: Smithsonian Institute Press, 1995), 170-1.

[43] Operational Research Section, Headquarters, VIII Bomber Command, *General Summary of Battle Damage Data From August 17, 1942 Through May 5, 1943*, 520.310 Volume I, in USAF Collection, AFHRA, 2-3.

[44] Headquarters, Eighth Air Force, *Statistical Summary of Eighth Air Force Operations: European Theater, 17 Aug 1942 - 8 May 1945*, 520.308A, in USAF Collection, AFHRA, 31.

[45] United States Strategic Bombing Survey, *Bombing Accuracy, USAAF Heavy and Medium Bombers (European Report #63)*, (New York: Garland Publishing Inc., 1976), Exhibit H.

[46] Office of the Operations Officer, Headquarters, 306th Bombardment Group (H), *Summary of First 100 Operations*, GP-306-HI, Jan 44, in USAF Collection, AFHRA.

[47] Gerald Astor, *The Mighty Eighth: The Air War in Europe as Told by the Men Who Fought it*, (New York: Donald I. Fine Books, 1997), 400.

[48] Stephen L. McFarland, *America's Pursuit of Precision Bombing, 1910-1945*, (Washington, D.C.: Smithsonian Institute Press, 1995), 181. "A second means of blind bombing, self-contained radar systems, were products of General Arnold's decision in 1940 to name 'bombing through overcast' as the Air Corps' 'problem No. 1' for the consideration of the newly established National Defense Research Committee… Out of this research came… the American H2X, popularly known as 'Mickey.' These devises measured reflections of radio transmissions off terrain features. H2S and H2X were primarily for high-altitude aerial navigation, most useful when land/water contrasts were present. H2S used the S band (10 cm) and had poor resolution, making identification of ground features difficult. H2X used the X band (3 cm) and had better resolution from its high frequency and a range advantage over the H2S radar of 30 to 50 miles, reaching out as far as 90 miles. Army Air Force first used the H2S operationally in September 1943, the H2X in November 1943."

[49] Stephen L. McFarland, *America's Pursuit of Precision Bombing, 1910-1945*, (Washington, D.C.: Smithsonian Institute Press, 1995), 182-3.

[50] United States Strategic Bombing Survey, *Weather Factors in Combat Bombardment Operations in the European Theatre (European Report #62)*, (New York: Garland Publishing Inc., 1976), Exhibit V.

[51] Stephen L. McFarland, *America's Pursuit of Precision Bombing, 1910-1945*, (Washington, D.C.: Smithsonian Institute Press, 1995), 182-3.

Notes

[52] Stephen L. McFarland and Wesley Phillips Newton, *To Command the Sky: The Battle for Air Superiority over Germany, 1942-1944*, (Washington, D.C.: Smithsonian Institution Press, 1991), 169.

[53] Stephen L. McFarland and Wesley Phillips Newton, *To Command the Sky: The Battle for Air Superiority over Germany, 1942-1944*, (Washington, D.C.: Smithsonian Institution Press, 1991), 194.

[54] *Monthly War Diary*, GP-306-HI, in USAF Collection, AFHRA, Feb 44 - Jun 44.

[55] Office of Statistical Control, Headquarters, Army Air Forces, *Army Air Forces Statistical Digest: World War II*, (December 1945), 221, 255.

[56] Stephen L. McFarland and Wesley Phillips Newton, *To Command the Sky: The Battle for Air Superiority over Germany, 1942-1944*, (Washington, D.C.: Smithsonian Institution Press, 1991), 172.

[57] *Monthly War Diary*, GP-306-HI, in USAF Collection, AFHRA, Feb 44.

[58] Russell A. Strong, ed., *369th Squadron Combat Diary 1942-45*, (306th Bomb Group Historical Association, 1997), 39.

[59] Geoffrey Perret, *Winged Victory: The Army Air Forces in World War II*, (New York: Random House, 1993), 287-289.

[60] Office of Statistical Control, Headquarters, Army Air Forces, *Army Air Forces Statistical Digest: World War II*, (December 1945), 221, 255.

[61] *Monthly War Diary*, GP-306-HI, in USAF Collection, AFHRA, Dec 43 - Apr 45.

[62] Stephen L. McFarland and Wesley Phillips Newton, *To Command the Sky: The Battle for Air Superiority over Germany, 1942-1944*, (Washington, D.C.: Smithsonian Institution Press, 1991), 172.

[63] Stephen L. McFarland and Wesley Phillips Newton, *To Command the Sky: The Battle for Air Superiority over Germany, 1942-1944*, (Washington, D.C.: Smithsonian Institution Press, 1991), 166.

[64] *Monthly War Diary*, GP-306-HI, in USAF Collection, AFHRA, Feb 44 - Jun 44.

[65] United States Strategic Bombing Survey, *Bombing Accuracy, USAAF Heavy and Medium Bombers (European Report #63)*, (New York: Garland Publishing Inc., 1976), 13.

[66] Headquarters, Eighth Air Force, *Statistical Summary of Eighth Air Force Operations: European Theater, 17 Aug 1942 - 8 May 1945*, 520.308A, in USAF Collection, AFHRA, 31.

[67] Lieutenant Colonel John H. Woolnought, *The Eighth Air Force Yearbook*, (Hollywood, FL: Eighth Air Force News, 1980), 191.

[68] United States Strategic Bombing Survey, *Air Force Rate of Operations (European Report #61)*, (New York: Garland Publishing Inc., 1976), 34.

[69] Stephen L. McFarland and Wesley Phillips Newton, *To Command the Sky: The Battle for Air Superiority over Germany, 1942-1944*, (Washington, D.C.: Smithsonian Institution Press, 1991), 240-1.

[70] Office of Statistical Control, Headquarters, Army Air Forces, *Army Air Forces Statistical Digest: World War II*, (December 1945), 255.

[71] *Monthly War Diary*, GP-306-HI, in USAF Collection, AFHRA, Jul 44 - May 45.

Notes

[72] Office of Statistical Control, Headquarters, Army Air Forces, *Army Air Forces Statistical Digest: World War II*, (December 1945), 221, 255.

[73] *Monthly War Diary*, GP-306-HI, in USAF Collection, AFHRA, Jul 44.

[74] *Monthly War Diary*, GP-306-HI, in USAF Collection, AFHRA, May 44.

[75] *Monthly War Diary*, GP-306-HI, in USAF Collection, AFHRA, Nov 44.

[76] *Monthly War Diary*, GP-306-HI, in USAF Collection, AFHRA, Apr 45.

[77] *Monthly War Diary*, GP-306-HI, in USAF Collection, AFHRA, Oct 44.

[78] Russell A. Strong, ed., *369th Squadron Combat Diary 1942-45*, (306th Bomb Group Historical Association, 1997), 88.

[79] *Monthly War Diary*, GP-306-HI, in USAF Collection, AFHRA, Feb 45.

[80] Stephen L. McFarland, *America's Pursuit of Precision Bombing, 1910-1945*, (Washington, D.C.: Smithsonian Institute Press, 1995), 180. "Gee used one master and two subordinate stations transmitting radio pulses. The bomber's equipment measured the differences in time between the arrival of the different transmissions. The intersection of the beams and Gee charts allowed the navigator to determine the aircraft's location. Gee had a range of only 300 to 400 miles, was accurate to within five miles, and was subject to enemy jamming."

[81] Stephen L. McFarland, *America's Pursuit of Precision Bombing, 1910-1945*, (Washington, D.C.: Smithsonian Institute Press, 1995), 180. "Oboe used two ground stations transmitting radio pulses to bomber aircraft. It differed from Gee in that the bomber received the pulses, boosted them, and transmitted them back to the ground stations. Ground stations timed the pulses to measure the range to the aircraft. One station tracked the aircraft over the target while the other determined the bomb release point. Oboe had shorter range than Gee, but could achieve accuracies of several hundred yards. Neither Gee nor Oboe required bombsights. The Army Air Forces used Oboe rarely because of range limitations."

[82] Stephen L. McFarland, *America's Pursuit of Precision Bombing, 1910-1945*, (Washington, D.C.: Smithsonian Institute Press, 1995), 180. "Gee-H was Gee plus Oboe in reverse, but required a bombsight. An aircraft carried a transmitter and a receiver, bouncing signals off two ground stations to determine range, which appeared on a scope in the aircraft. Accuracy was similar to Oboe, but with greater range due to a longer radio beam. The operator fed rate information to the bombardier, who used visual sightings when possible to improve accuracy. When first used on January 28, 1944, Eighth Air Force achieved an average circular error of 1,864 feet on Gee-H missions."

[83] Stephen L. McFarland, *America's Pursuit of Precision Bombing, 1910-1945*, (Washington, D.C.: Smithsonian Institute Press, 1995), 180. "Micro-H triggered Gee-H ground beacons, whose signals appeared on a radar screen in the aircraft, adding Gee-H range information to the ground returns of the radar equipment. The radar operator called out predetermined check points, allowing the bombardier to synchronize his bombsight. Micro-H improved ground-beacon accuracy to around 1,500 feet and entered combat for Eighth Air Force on August 5, 1944."

Notes

[84] United States Strategic Bombing Survey, *Bombing Accuracy, USAAF Heavy and Medium Bombers (European Report #63)*, (New York: Garland Publishing Inc., 1976), 13.

[85] Headquarters, Eighth Air Force, *Statistical Summary of Eighth Air Force Operations: European Theater, 17 Aug 1942 - 8 May 1945*, 520.308A, in USAF Collection, AFHRA, 31.

[86] Stephen L. McFarland, *America's Pursuit of Precision Bombing, 1910-1945*, (Washington, D.C.: Smithsonian Institute Press, 1995), 179.

[87] United States Strategic Bombing Survey, *Bombing Accuracy, USAAF Heavy and Medium Bombers (European Report #63)*, (New York: Garland Publishing Inc., 1976), Exhibit H.

[88] *Monthly War Diary*, GP-306-HI, in USAF Collection, AFHRA, Nov 44.

[89] *Monthly War Diary*, GP-306-HI, in USAF Collection, AFHRA, Nov 44.

[90] *Monthly War Diary*, GP-306-HI, in USAF Collection, AFHRA, Feb 45.

[91] *Monthly War Diary*, GP-306-HI, in USAF Collection, AFHRA, Sep 44.

[92] Roger A. Freeman, *The Mighty Eighth in Color*, (Stillwater, MN: Specialty Press, 1992), 141.

[93] Captain William C. Van Norman, First Lieutenant Dwain A. Esper, and Corporal Arthur P. Bove, *History of the 306th Bombardment Group (H)*, GP-306-HI, in USAF Collection, AFHRA, 22.

[94] *Monthly War Diary*, GP-306-HI, in USAF Collection, AFHRA, Jul 44.

[95] *Monthly War Diary*, GP-306-HI, in USAF Collection, AFHRA, Apr 45

Chapter 4

Conclusions

> *We died on the wrong page of the almanac, Scattered on mountains fifty miles away; Diving on haystacks, fighting with a friend, We blazed up on the lines we never saw. We died like aunts or pets or foreigners.*[1]
>
> —Randall Jarrell

In the previous chapters, the analysis of the 306th Bomb Group and its contributions to World War II were provided. While the analysis was brief in spots and data intensive in others, the following will put in "plain English" the conclusions of the study. These conclusions will primarily focus on the areas of aircraft losses and bombing accuracy, but several other topics will also be discussed briefly.

In general, we can conclude that the 306th Bomb Group was a "typical" World War II B-17 bomber group. When comparing the various statistics and graphs provide in this paper, we see that in most cases there was little difference in the data for the 306th and the Eighth Air Force. However, it is not appropriate to stop the analysis at this point.

The 306th was one of the cadre groups of the Eighth Air Force, and by the end of the war, became the oldest operational group in the Eighth Air Force. In fact, the group was also stationed at one British base longer than any other group.[2] As one of the cadre groups, many of the lessons learned were at the expense of the 306th and the other cadre

groups, but these lessons were important. The early lessons and experiments led to the improvements that eventually saved many lives and brought an end to the war.

Although the 306th's early record for losses and bombing accuracy was below par, the group went on to improve performance and achieve many great accomplishments. Looking at the list of awards and decorations received by the unit, we see that the 306th received more than their fair share of the recognition.

Table 2. Awards and Decorations[3,4]

	306th	**8 AF**
Medal of Honor	1	14
Unit Citations	2	27
Distinguished Service Cross	7	220
Legion of Merit	5	207
Silver Star	39	817
Distinguished Flying Cross	1,511	41,497
Soldier's Medal	5	478
Purple Heart	447	6,845
Air Medal	14,094	122,705
Bronze Star	65	2,972

When comparing the data in Table 2, it is important to note there were as many as 56 groups in the Eighth Air Force during the war.[5] With that fact in mind, the only award that the 306th received less than the "average" was the Soldiers Medal. In all other cases, the 306th was much higher than the average.

Looking at accuracy of bombing, this was not a problem confined to the 306th, but throughout the allied air forces. American and British researchers developed numerous

approaches to solving the problem, but in the end it was visual bombing that delivered most of the bombs within the target area.

Weather was one of the main enemies of precision bombing, and throughout the war there was a high level of missions aborted or canceled due to poor weather conditions. Weather actually caused an abort rate as high as 20%.[6] Even with radar bombing techniques, heavy overcast would frequently prevent launching aircraft from finding their formations and would have to return to base.

Weather severely limited the number of operational days available for bombing missions. Because of weather, 25% of all days were non-operational for the Eighth Air Force.[7] For example, during the initial phase of the Battle of the Bulge, poor weather directly prevented the use of air power to support the ground troops and stop the German advance. To offset some of the weather limitations, the Eighth Air Force implemented the use of weather scouts that would fly in advance of a formation. The scouts, called "Buckeye Red,"[8] would radio back to a formation with reports of weather over a target, identify conditions at alternate targets, and recommend the use of visual or radar bombing techniques.

The USSBS identified several many additional factors that would effect bombing accuracy. Among these factors were altitude, size of formation, size of the combat box, order of the box within the formation, cloud cover, type of target being bombed, and type of aircraft used. Additionally, the USSBS reported enemy opposition affected bombing accuracy by requiring the formation to fly high, attack in larger formations, and with bigger combat boxes—all of which tended to decrease bombing effectiveness.[9]

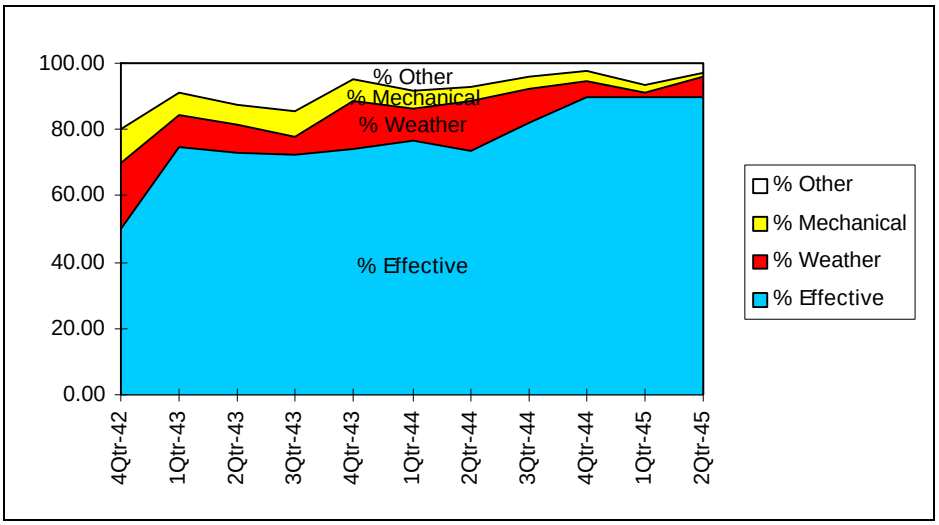

Figure 12. Causes of Sortie Aborts[10]

Other than the weather aborts discussed above, mechanical problems and maintenance were the other major causes of aircraft aborts. While weather aborts tended to be seasonal, maintenance aborts steadily decreased through out the war. The percentage of maintenance aborts was typically lower each month than the weather aborts.[11] Data for January 1944 to April 1945 show engine problems consistently being the source of the mechanical malfunctions.[12]

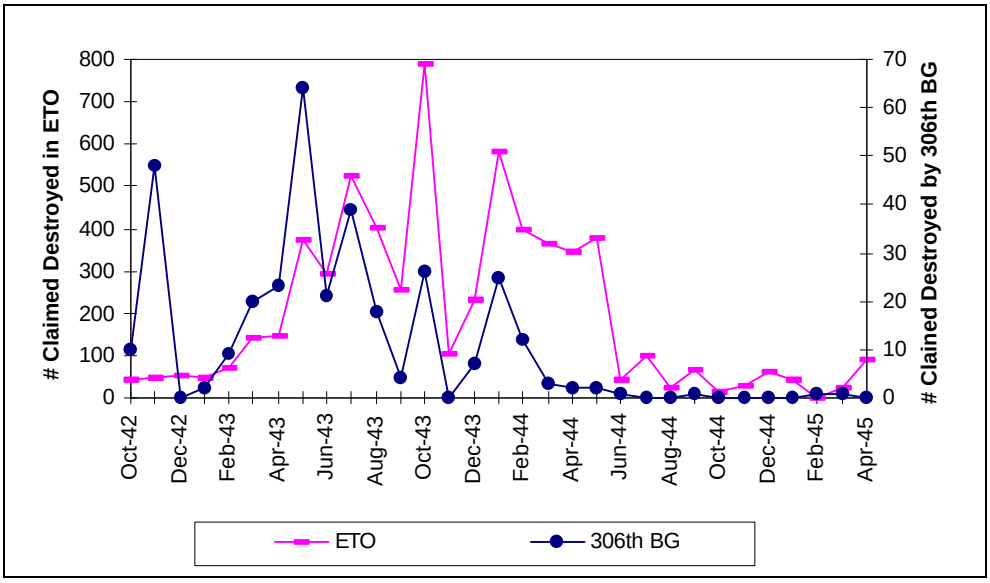

Figure 13. Number of Enemy Aircraft Claims[13]

One measure of success that the paper intentionally avoided was the number of enemy aircraft claimed destroyed. Due to the enormous amount of inflation and inaccuracies in the data collected during the war, aircraft claims were not be analyzed. Stephen McFarland's research in this area found large variances in the number of aircraft claimed destroyed, depending on the source of the data. For period of October 1943 to May 1945, his study shows the number of aircraft destroyed ranging from 1,038 to 4,167.[14] Although the data on enemy aircraft claims was not analyzed, it has been provided in the appendices of this paper. This data could, however, be useful for drawing very general conclusions from the trends indicated or on size/intensity of enemy attacks.

Summary

The 306th Bomb Group was an effective and important member of the Eighth Air Force's heavy bomber team. At a time when mass of forces was critical for achieving victory, every effective and functioning unit was needed. Although an average unit by some measures, the 306th's contributions toward the defeat of Nazi Germany were vital. Some accomplishments led directly to destroying the enemy in the air and on the ground, but many other accomplishments were as lessons learned that saved the lives of Eighth Air Force crews.

In closing this paper, I leave you with the words of poet Randall Jarrell. The following passage is an extract from his poem "The Second Air Force," and provides a reminder that not all of the brave airmen made it back home safely.

> Remembering,
> She hears the bomber calling, Little Friend!
> To the Fighter hanging in the hostile sky,
> And sees the ragged flame eat, rib by rib,

Along the metal of the wing into her heart:
The lives stream out, blossom, and float steadily
To the flames of the earth, the flames
That burn like stars above the lands of men.[15]

Notes

[1] Randall Jarrell, *The Complete Poems*, (New York: Farrar, Straus & Giroux, 1969), 145. From the poem "Losses."

[2] Roger A. Freeman, *The Mighty Eighth: Units, Men and Machines (A History of the US 8th Army Air Force)*, (Garden City, NY: Doubleday and Co., 1978), 248.

[3] Headquarters, Eighth Air Force, *Statistical Summary of Eighth Air Force Operations: European Theater, 17 Aug 1942 - 8 May 1945*, 520.308A, in USAF Collection, AFHRA, 6.

[4] Captain William C. Van Norman, First Lieutenant Dwain A. Esper, and Corporal Arthur P. Bove, *History of the 306th Bombardment Group (H)*, GP-306-HI, in USAF Collection, AFHRA, 34.

[5] Headquarters, Eighth Air Force, *Statistical Summary of Eighth Air Force Operations: European Theater, 17 Aug 1942 - 8 May 1945*, 520.308A, in USAF Collection, AFHRA, 8-13.

[6] Office of Statistical Control, Headquarters, Army Air Forces, *Army Air Forces Statistical Digest: World War II*, (December 1945), 232.

[7] United States Strategic Bombing Survey, *Weather Factors in Combat Bombardment Operations in the European Theatre (European Report #62)*, (New York: Garland Publishing Inc., 1976), 2.

[8] *Monthly War Diary*, GP-306-HI, in USAF Collection, AFHRA, Oct 44-Apr 45.

[9] United States Strategic Bombing Survey, *Bombing Accuracy, USAAF Heavy and Medium Bombers (European Report #63)*, (New York: Garland Publishing Inc., 1976), 1.

[10] Headquarters, Eighth Air Force, *Statistical Summary of Eighth Air Force Operations: European Theater, 17 Aug 1942 - 8 May 1945*, 520.308A, in USAF Collection, AFHRA, 221 & 232.

[11] Office of Statistical Control, Headquarters, Army Air Forces, *Army Air Forces Statistical Digest: World War II*, (December 1945), 232.

[12] *Eighth Air Force Monthly Summary of Operations*, 520.3083-1, in USAF Collection, AFHRA, "Bomber Abortives" Chart for Jan 44 – Apr 45.

[13] Source of 306th data: *Monthly War Diary*, GP-306-HI, in USAF Collection, AFHRA, Oct 44-Apr 45; Source of ETO data: Headquarters, Eighth Air Force, *Statistical Summary of Eighth Air Force Operations: European Theater, 17 Aug 1942 - 8 May 1945*, 520.308A, in USAF Collection, AFHRA,255.

[14] Stephen L. McFarland and Wesley Phillips Newton, *To Command the Sky: The Battle for Air Superiority over Germany, 1942-1944*, (Washington, D.C.: Smithsonian Institution Press, 1991), 249-250.

[15] Randall Jarrell, *The Complete Poems*, (New York: Farrar, Straus & Giroux, 1969), 177-8. From the poem "Second Air Force."

Appendix A

Mission Summary

The table on the following pages provides a summary of the data collected for each combat mission completed by the 306th Bomb Group, during World War II. All of the information used to generate the table come from the 306th War Diaries,[1] located at the Air Force Historical Research Agency (AFHRA) at Maxwell Air Force Base, Alabama. The following provides a description of each column contained in the table.

Column 1 (Mission #): Sequential number of the mission

Column 2 (E/A): Indicates intensity of enemy aircraft defenses. Inputs are as follows:

1. LT = Light
2. MOD = Moderate
3. HVY = Heavy
4. YES = Enemy aircraft present but intensity not provided
5. NO = No enemy aircraft present or attacked
6. UNK = Data not provided

Column 3 (FLAK): Indicated the intensity of enemy flak defenses encountered. Inputs are as follows:

1. LT = Light
2. MOD = Moderate
3. HVY = Heavy
4. INA = Inaccurate
5. ACC = Accurate
6. YES = Enemy aircraft present but intensity not provided
7. UNK = Data not provided
8. NO = No enemy aircraft present or attacked

Column 4 (Date): Date of the mission

Column 5 (# A/C Not Eff): Number of aircraft that were not effective. This includes aircraft that aborted for weather reasons, maintenance problems, or other reasons that prevented it from completing the mission

Column 6 (# A/C Eff): Number of aircraft that completed the intended mission

Column 7 (Location): Location of the target

Column 8 (WX): Weather conditions over the target. Numbers represent the percentage of visibility, expressed in tenths. For example, an entry of "8" signifies 80% of the sky was covered with clouds. Other entries are as follows:

1. GOOD = Good
2. BAD = Poor weather, but no percentage given
3. OK = Good
4. PART = Partial cloud cover, but no percentage given
5. Smoke = Smoke over target, usually from bombs of previous group
6. Haze = Haze over target
7. Fair = Conditions were fair, but no percentage given
8. Blank = Unknown condition

Column 9 (Escort): Indicated the presence of friendly fighter escorts. Entries include:

1. YES = Escort present, but duration not specified
2. NO = Escorts were not present
3. PART = Escorts were only present during part of the mission, usually on the way to the target and/or on the return
4. AREA = Escorts only provided in the area of the target
5. FULL = Escorts provided during entire mission
6. Blank = Unknown

Column 10 (# E/A Claims): Indicates the number of enemy aircraft that were claimed destroyed by the crews

Column 11 (# Loss): Number of aircraft shot down or lost during the mission

Column 12 (# A/C Damaged): Number of aircraft damaged but not destroyed during the mission. If blank, the data was not available.

Column 13 (Target): Indicates the type of target attacked. Abbreviations used are as follows:

1. M/Y = Marshalling Yard
2. A/D = Airdrome

Column 14 (Bomb Method): Indicated the bombing technique used. Possible entries are as follows:

1. Vis = Visual
2. PFF = Pathfinder H2X radar
3. PFF/Vis = Pathfinder with visual correction
4. Gee-H = Gee-H radar bombing, usually with PFF also
5. Micro-H = Micro-H radar bombing used, usually with PFF also
6. Blank = Unknown

Column 15 (Bomb Results): Indicated the relative success of the bombing. Entries are as follows:

1. Good = Good
2. Fair = Fair
3. Poor = Poor
4. Exc = Excellent
5. Unk = Results unknown due to cloud cover
6. PFF = Data not collected due to cloud cover
7. Blank = Data not provided

Column 16 (Remarks): Provides miscellaneous comments, including: type and number of enemy aircraft encountered, type and number of fighter escorts, Weather aborts, problems encountered, and etc.

Notes

[1] *Monthly War Diary*, GP-306-HI, in USAF Collection, AFHRA, Oct 42-Apr 45.

Table 3. 306th Mission Summary

Mission #	E/A	FLAK	Date	# A/C Not Eff	# A/C Eff	Location	WX	Escort	# E/A Claims	# Loss	# A/C Damaged	Target	Bomb Method	Bomb Results	Remarks
1	YES	HVY	9-Oct-42	4	20	Lille FR	.	.	10	1	19	M/Y & Five-Lille Locomotive Works	Vis	Poor	E/A=FW-190s
2	HVY	UNK	7-Nov-42	9	15	Brest	10	.	1	0	.	Docks	Vis	Poor	.
3	YES	UNK	8-Nov-42	7	13	Lille FR	OK	.	9	1	11	.	Vis	Poor	.
4	UNK	HVY/ACC	9-Nov-42	1	18	St. Nazaire	.	.	0	3	.	Sub Pens	Vis	Poor	Low level bomb run test; E/A=30 FW-190
5	NO	HVY/ACC	14-Nov-42	1	6	St. Nazaire	BAD	.	0	0	.	.	Vis	Poor	.
6	HVY	HVY/ACC	17-Nov-42	4	9	St. Nazaire	.	.	1	0	2	.	Vis	Poor	E/A=FW-190
7	YES	HVY	18-Nov-42	1	13	La Pallice	PART	.	2	1	.	.	Vis	Good	.
8	UNK	UNK	22-Nov-42	9	0	Lorient	10	.	0	0	.	.	Vis	.	Abort
9	HVY	UNK	23-Nov-42	4	4	St. Nazaire	.	.	9	1	.	.	Vis	Poor	E/A=FW-190
10	HVY	UNK	12-Nov-42	12	6	Rouen FR	10	.	14	0	.	Railyard	Vis	Poor	E/A=50
11	HVY	UNK	19-Nov-42	2	17	Romilly	GOOD	.	12	3	.	.	Vis	Good	E/A=50-70 JU-88,ME-109,FW-190
12	YES	UNK	30-Nov-42	17	1	Lorient	.	.	0	1	.	.	Vis	.	Abort
13	YES	HVY/ACC	3-Jan-43	0	17	St. Nazaire	OK	.	0	2	1	Torpedo dump	Vis	Poor	.
14	YES	MOD	13-Jan-43	3	14	Lille FR	OK	YES	0	2	.	Engineering & Locomotive Works	Vis	Good	ESC=Spitfires,P-47
15	YES	HVY/INA	24-Jan-43	3	14	Lorient	OK	.	2	0	.	Military Post & Sub base	Vis	Fair	.
16	YES	MOD/ACC	27-Jan-43	2	14	Wilhemshaven GR	BAD	NO	0	0	.	.	Vis	Fair	First Mission Over Germany
17	YES	NO	2-Feb-43	18	0	Hamm FR	BAD	.	0	0	.	.	Vis	.	WX Abort
18	YES	YES	4-Feb-43	0	17	Emden	BAD	.	5	0	.	Docks	Vis	Poor	E/A=JU-88,ME-110,ME-109,FW-190
19	NO	NO	14-Feb-43	20	0	Bremen GR	.	.	0	0	.	.	Vis	.	WX Abort
20	YES	HVY	16-Feb-43	2	18	St. Nazaire	GOOD	.	3	2	.	Sub Basin	Vis	Fair	.
21	YES	YES	26-Feb-43	4	13	Wilhemshaven GR	BAD	NO	1	0	.	Dock Area	Vis	Unk	.
22	YES	YES	27-Feb-43	1	16	Brest	BAD	YES	0	0	.	.	Vis	Poor	.
23	YES	HVY/ACC	4-Mar-43	21	0	Hamm FR	BAD	.	1	1	.	.	Vis	.	WX Abort
24	YES	YES	6-Mar-43	0	21	Lorient	GOOD	.	6	2	.	Power Station	Vis	Good	FW-190
25	LT	LT	8-Mar-43	3	15	Rennes	GOOD	.	3	1	.	M/Y	Vis	Good	.
26	LT	LT	12-Mar-43	0	19	Rouen FR	GOOD	YES	0	0	.	M/Y	Vis	Good	.
27	LT	UNK	13-Mar-43	0	20	Amiens	BAD	.	0	0	.	M/Y	Vis	Poor	Vapor Trails
28	HVY	HVY	18-Mar-43	0	20	Vegesack	GOOD	.	7	0	.	Sub Building	Vis	Good	E/A Drop Timebombs on Formation
29	YES	HVY	22-Mar-43	0	19	Wilhemshaven GR	7	.	2	0	YES	Dock	Vis	Poor	E/A Drop Timebombs on Formation
30	LT	LT	28-Mar-43	0	20	Rouen FR	5	YES	1	0	1	M/Y	Vis	Good	.
31	LT	UNK	31-Mar-43	19	0	Rotterdam	10	YES	0	0	.	.	Vis	.	Abort
32	HVY	MOD/INA	4-Apr-43	3	27	Paris FR	GOOD	YES	7	0	.	Renault Works	Vis	Good	E/A=75
33	HVY	UNK	5-Apr-43	4	16	Antwerp	.	PART	5	4	.	Erla Military Truck Works	Vis	Poor	E/A=100 FW-190; E/A Drop Timebombs on Formation
34	MOD	UNK	16-Apr-43	5	15	Lorient	GOOD	.	3	0	.	Power Station	Vis	Fair	.
35	HVY	HVY	17-Apr-43	2	24	Bremen GR	.	.	8	10	.	Focke Wulf Aircraft Plant	Vis	Poor	E/A=100
36	YES	MOD	1-May-43	3	15	St. Nazaire	BAD	.	8	3	1	.	Vis	Poor	E/A=FW-190; SGT "Snuffy" Smith earns CMH
37	UNK	UNK	13-May-43	3	21	Meaulto	GOOD	YES	0	0	.	Airframe Factory	Vis	Good	ESC=Spitfires,P-47

Mission #	E/A	FLAK	Date	# A/C Not Eff	# A/C Eff	Location	WX	Escort	# E/A Claims	# Loss	# A/C Damaged	Target	Bomb Method	Bomb Results	Remarks
38	LT	UNK	14-May-43	0	26	Kiel GR	.	.	11	0	.	Naval Base	Vis	Good	.
39	HVY	HVY	15-May-43	1	23	Heloligeland	BAD	.	17	3	YES	.	Vis	Good	E/A=100
40	MOD	MOD	17-May-43	3	21	Lorient	GOOD	.	2	0	.	Sub Pens	Vis	Poor	.
41	MOD	MOD	19-May-43	3	21	Kiel GR	.	.	3	0	.	Ship Building Yard	Vis	Fair	E/A=50; Incendiary Bombs
42	HVY	YES	21-May-43	4	17	Wilhemshaven GR	.	.	23	2	.	.	Vis	Poor	E/A=100; 11 E/A Claimed by one crew--New Record
43	LT	MOD	29-May-43	3	21	St. Nazaire	.	.	0	0	.	.	Vis	Fair	.
44	LT	UNK	11-Jun-43	3	24	Wilhemshaven GR	10	.	7	0	.	.	Vis	Poor	E/A=75-100 Seen; E/A Drop Timebombs; Strange T-shaped object seen
45	LT	YES	13-Jun-43	.	28	Bremen GR	GOOD	.	0	1	.	Sub Building Works	Vis	Poor	.
46	MOD	MOD	22-Jun-43	8	16	Huls	.	.	4	1	.	Synthetic Rubber Plant	Vis	Fair	E/A=100 Seen
47	HVY	UNK	25-Jun-43	3	20	N.W. Germany	BAD	.	3	1	.	.	Vis	Unk	E/A=75-100, dropped timebombs; E/A fire high cal. exploding air-air shells
48	HVY	UNK	26-Jun-43	2	19	Tricqueville	BAD	.	4	0	YES	A/D	Vis	Poor	.
49	MOD	UNK	28-Jun-43	2	19	St. Nazaire	.	.	3	0	YES	Locks	Vis	Poor	E/A Drop Timebombs on Formation
50	MOD	UNK	29-Jun-43	21	0	Villacoublay	10	YES	0	0	.	.	Vis	.	E/A=15-20; WX Abort
51	HVY	MOD	4-Jul-43	5	22	Nantes FR	GOOD	.	7	0	.	A/C Factory	Vis	Good	E/A=50
52	LT	LT	10-Jul-43	10	15	Caen	10	.	0	0	.	Airfield	Vis	Fair	.
53	MOD	INA	14-Jul-43	1	23	Villacoublay	GOOD	.	6	0	.	Repair hangar	Vis	Poor	.
54	YES	UNK	17-Jul-43	28	0	N.W. Germany	.	.	3	0	.	.	Vis	.	E/A=30; WX Abort
55	YES	ACC	24-Jul-43	1	20	Heroya NORWAY	GOOD	.	3	0	.	Magnesium Works	Vis	Good	E/A=15
56	HVY	HVY	26-Jul-43	0	21	Hanover	GOOD	.	4	3	.	Synthetic Rubber Plant	Vis	Fair	E/A w/air-air rockets
57	HVY	YES	28-Jul-43	8	16	Kassel GR	.	PART	10	2	17	A/C Component Works	Vis	Fair	E/A=100, Esc=one P-47
58	HVY	UNK	29-Jul-43	5	13	Kiel GR	.	.	6	4	.	Sub Plant	Vis	Poor	E/A=100, ME-110 w/air-air rockets
59	HVY	HVY	12-Aug-43	4	16	Gelsenkirchen GR	10	.	1	1	.	.	Vis	Poor	E/A=150
60	NO	LT	15-Aug-43	0	20	Flushing	10	.	0	0	.	A/D	Vis	Poor	.
61	HVY	INA	16-Aug-43	1	19	Le Bourget	.	PART	1	0	.	Hangars & Barracks	Vis	Good	Esc=P-47
62	HVY	UNK	17-Aug-43	0	30	Schweinfurt GR	.	NO	16	0	.	Ball Bearing Plants	Vis	Good	"FIRST" SCHWEINFURT; NO A/C Lost
63	NO	LT	19-Aug-43	0	20	Brussels	10	YES	0	0	.	A/D	Vis	Poor	.
64	UNK	ACC	24-Aug-43	0	18	Villacoublay	.	YES	0	0	17	.	Vis	Poor	.
65	NO	ACC	27-Aug-43	9	9	Watten	.	.	0	0	18	.	Vis	Poor	Saw mysterious hole in ground?
66	UNK	UNK	31-Aug-43	18	0	Amiens	9	YES	0	0	.	A/D	Vis	.	Esc=P-47; Abort
67	LT	MOD	3-Sep-43	2	16	Romilly-Sur-Seine FR	BAD	PART	1	0	.	A/D	Vis	Unk	Esc=P-47
68	LT	MOD/ACC	6-Sep-43	1	20	Stuttgart GR	BAD	.	3	2	16	.	Vis	Unk	E/A=30-40 FW-190
69	NO	LT/INA	7-Sep-43	1	11	Brussels-Evere	GOOD	YES	0	0	0	.	Vis	Good	.
70	NO	YES	9-Sep-43	1	17	Lille-Vendeville FR	.	.	0	0	7	A/D	Vis	Poor	Possible dummy field bombed
71	LT	MOD/INA	15-Sep-43	1	17	Romilly	.	PART	0	0	0	A/D	Vis	Good	E/A=10-15 w/air-air rockets--driven-off by escort (P-47)
72	NO	INA	16-Sep-43	0	18	Nantes FR	BAD	.	0	0	.	Airfield	Vis	Good	.
73	YES	MOD/ACC	23-Sep-43	4	14	Nantes FR	.	YES	0	0	8	Docks	Vis	Good	E/A=3 seen--driven of byescort; ESC=P-47
74	NO	MOD	27-Sep-43	0	18	Emden	10	YES	0	0	.	.	PFF	PFF	E/A=20-30 seen--P-47s engage; test bombing w/PFF--poor results
75	NO	LT	2-Oct-43	0	18	Emden	10	.	0	0	.	.	PFF	PFF	E/A seen
76	YES	UNK	4-Oct-43	4	14	Frankfurt GR	.	PART	5	0	.	Propeller Works	Vis	Fair	ESC=Spitfires,P-47

Mission #	E/A	FLAK	Date	# A/C Not Eff	# A/C Eff	Location	WX	Escort	# E/A Claims	# Loss	# A/C Damaged	Target	Bomb Method	Bomb Results	Remarks
77	HVY	HVY/ACC	8-Oct-43	0	20	Bremen GR	Smoke	.	15	3	20	Aircraft Factory	.	Fair	E/A=150; Ger Air-Air rockets
78	MOD	LT	9-Oct-43	1	20	Gdynia	.	.	2	1	.	Naval Facility & Port	.	Good	.
79	NO	LT	10-Oct-43	0	18	Munster GR	.	.	0	0	.	M/Y & Textile Plant	.	Poor	.
80	HVY	LT/ACC	14-Oct-43	3	15	Schweinfurt GR	.	PART	4	10	.	Ball Bearing Plants	.	Good	"2ND SCHWEINFURT; E/A=300; Ger Air-Air rockets; Esc=P-47
81	UNK	UNK	20-Oct-43	11	0	Duren	10	.	0	0	.	.	.	.	Abort
82	LT	LT	3-Nov-43	0	25	Wilhemshaven GR	10	YES	0	2	.	.	PFF	PFF	Esc=P-47/38
83	LT	HVY	5-Nov-43	7	17	Gelsenkirchen GR	Haze	YES	0	0	.	Industry	PFF	PFF	Esc=P-47/38; E/A seen but no attacks
84	UNK	UNK	13-Nov-43	1	1	Bremen GR	10	.	0	2	.	.	PFF	PFF	.
85	LT	LT	16-Nov-43	3	20	Knaben	GOOD	.	0	0	.	Molybdenum Mining	.	Fair	.
86	HVY	HVY/INA	26-Nov-43	1	28	Bremen GR	Fair	.	0	2	.	.	PFF	PFF	E/A=75-100, w/air-air rockets
87	YES	MOD/ACC	1-Dec-43	0	22	Solingen	10	PART	1	1	9	Component & Tooling	PFF	PFF	.
88	UNK	YES	5-Dec-43	21	0	LaRochelle	10	.	0	0	1	Airfield & Factories	.	.	Abort
89	NO	MOD/ACC	11-Dec-43	0	20	Emden	Smoke	YES	0	1	16	.	.	Good	Esc=P-51
90	LT	MOD	13-Dec-43	3	19	Kiel GR	10	YES	0	1	.	.	PFF	PFF	ESC=Spitfires,P-38/51
91	LT	HVY/ACC	16-Dec-43	3	18	Bremen GR	10	YES	0	0	1	.	PFF	PFF	.
92	NO	HVY	20-Dec-43	5	16	Bremen GR	3	PART	0	1	.	.	.	Unk	E/A=28, but no attacks; Esc=P-47
93	HVY	LT/INA	22-Dec-43	0	21	Osnabruck	10	PART	6	1	1	.	PFF	PFF	E/A=15 Me-109
94	NO	NO	24-Dec-43	1	25	N.E. France	GOOD	YES	0	0	.	V-Weapons	.	Fair/Exc	.
95	LT	LT/INA	30-Dec-43	3	25	Ludwigshaven GR	10	YES	0	0	.	I.G. Farbenindustries	PFF	PFF	Ground-Air Rocket attack; used chaff
96	LT	LT/INA	31-Dec-43	0	23	Cognac	GOOD	.	0	0	1	A/D	.	Good	.
97	NO	LT/INA	4-Jan-44	7	26	Kiel GR	8	YES	0	1	.	.	PFF	PFF	.
98	HVY	MOD	5-Jan-44	3	25	Kiel GR	Smoke	NO	4	1	1	Shipyard	PFF	Good	.
99	LT	ACC	7-Jan-44	1	22	Ludwigshaven GR	10	YES	0	0	11	Chemical Plant	PFF	PFF	Used Chaff
100	HVY	UNK	11-Jan-44	2	31	Halberstadt GR	GOOD	.	16	5	.	Component Plant	.	Poor	E/A=Me-109/FW-190
101	NO	NO	14-Jan-44	0	27	Pas de Calais FR	.	.	0	0	.	V-Weapons	.	.	.
102	NO	NO	21-Jan-44	34	0	Pas de Calais FR	.	.	0	0	.	V-Weapons	.	.	WX Abort
103	MOD	HVY	29-Jan-44	3	38	Frankfurt GR	10	PART	5	0	.	.	PFF	.	E/A=25; Rocket Flak
104	LT	LT	30-Jan-44	1	40	Brunswick	.	.	0	0	.	Aircraft Production	PFF	.	.
105	NO	MOD/INA	3-Feb-44	9	31	Wilhemshaven GR	10	YES	0	1	.	Ports	PFF	Good	.
106	NO	ACC	4-Feb-44	15	24	Frankfurt GR	10	.	0	2	1	.	PFF	.	.
107	NO	ACC	5-Feb-44	0	21	Chateaudun	GOOD	YES	0	0	11	Airfield	Vis	Exc	.
108	NO	LT	6-Feb-44	28	0	Nancy FR+G136	10	.	0	0	.	Airfield	.	.	WX Abort
109	LT	ACC	8-Feb-44	0	20	Frankfurt GR	10	PART	0	1	17	.	PFF	.	E/A=2 FW-190
110	UNK	MOD/ACC	11-Feb-44	1	20	Saarbrucken GR	.	YES	0	1	19	.	PFF/Vis	.	PFF Malf
111	YES	YES	20-Feb-44	21	20	Leipzig GR	.	.	0	1	.	Aeroworks	.	Exc	.
112	UNK	MOD/ACC	21-Feb-44	0	21	Rheine-Hopston	.	YES	1	0	17	.	Vis	.	.
113	HVY	ACC	22-Feb-44	10	29	Bernburg	.	.	6	7	23	.	.	.	E/A=20-30 FW-190
114	YES	MOD	24-Feb-44	3	17	Schweinfurt GR	.	.	2	2	.	Ball Bearing Plants	.	.	E/A=30 "Yellow nosed FW-190s"
115	YES	ACC	25-Feb-44	6	13	Augsburg GR	.	.	3	3	.	.	.	Good	E/A=Me-109
116	NO	MOD	28-Feb-44	7	17	Pas de Calais FR	.	.	0	0	7	V-Weapons	.	Good	.
117	NO	INA	2-Mar-44	7	19	Frankfurt GR	10	YES	0	0	.	.	PFF	.	Used Chaff; Esc by Brits
118	NO	LT	3-Mar-44	29	0	N.W. Germany	BAD	FULL	0	0	.	.	.	.	WX Abort
119	NO	LT/INA	4-Mar-44	20	6	Bonn GR	BAD	.	0	0	.	Target of Opportunity	PFF	unk	20 Abort due to WX

Mission #	E/A	FLAK	Date	# A/C Not Eff	# A/C Eff	Location	WX	Escort	# E/A Claims	# Loss	# A/C Damaged	Target	Bomb Method	Bomb Results	Remarks
120	LT	HVY	6-Mar-44	4	23	Berlin GR	Clouds	YES	2	1	.	.	.	.	E/A=50, but few attacks
121	LT	MOD/ACC	8-Mar-44	2	26	Berlin GR	GOOD	FULL	0	0	3	Erkner Ball Bearing	Vis	Exc	Esc=P-38/47/51
122	NO	MOD	9-Mar-44	2	19	Berlin GR	10	PART	0	0	.	.	PFF	Good	.
123	NO	MOD	16-Mar-44	8	24	Gessertshausen GR	10	PART	0	0	1	A/D	PFF	.	.
124	NO	LT	18-Mar-44	0	34	Lechfeld	GOOD	YES	0	0	YES	A/D	Vis	Exc	.
125	NO	MOD	20-Mar-44	20	0	S.W. Germany	BAD	.	0	0	YES	.	.	.	.
126	NO	HVY/ACC	22-Mar-44	6	29	Berlin GR	10	YES	0	0	29	Friedrich Strasse Station	PFF	.	.
127	NO	MOD	23-Mar-44	2	27	Hamm FR	8	FULL	0	0	.	.	.	Exc	.
128	NO	INA	24-Mar-44	0	21	Frankfurt GR	9	FULL	0	0	.	.	PFF	Exc	.
129	NO	HVY	26-Mar-44	5	25	Pas de Calais FR	GOOD	PART	0	1	19	V-Weapons	.	.	.
130	NO	ACC	27-Mar-44	3	18	LaRochelle	GOOD	YES	0	1	YES	A/D	PFF	Exc	.
131	NO	NO	28-Mar-44	1	20	Dijon/Longvic	GOOD	.	0	0	.	A/D	.	Exc	.
132	HVY	MOD	29-Mar-44	3	18	Brunswick	BAD	PART	1	3	.	.	PFF	.	E/A=FW-190
133	NO	LT/INA	10-Apr-04	0	21	Brussels/Evere	GOOD	YES	0	0	.	A/D	.	Good	.
134	HVY	ACC	11-Apr-04	3	25	Stettin GR	.	PART	1	2	25	Docks	Vis	Good	E/A=20
135	NO	LT/INA	18-Apr-04	1	26	Oranienburg GR	.	PART	0	0	.	He-111 Production	.	unk	.
136	NO	MOD/ACC	19-Apr-04	3	26	Kassel GR	GOOD	.	0	0	19	FW-190 Production	.	Exc	.
137	NO	INA	20-Apr-04	12	24	N.W. France	Haze	.	0	0	YES	V-Weapons	.	.	.
138	NO	MOD/ACC	22-Apr-04	0	30	Hamm FR	.	FULL	0	0	YES	M/Y	.	.	.
139	HVY	MOD/ACC	24-Apr-04	2	23	Oberpfaffenhofen GR	.	PART	0	10	.	Aircraft Assembly & Repair	.	.	E/A=150, FW-190&ME-109
140	NO	LT	25-Apr-04	18	5	Nancy FR	9	YES	0	0	.	Training base	.	Fair	.
141	NO	MOD/ACC	26-Apr-04	2	16	Brunswick	10	.	0	0	1	.	PFF	.	.
142	NO	NO	27-Apr-04	0	18	Pas de Calais FR	GOOD	.	0	0	1	V-Weapons	.	Fair	.
143	NO	MOD	27-Apr-04	0	18	Nancy FR	GOOD	PART	0	0	.	A/D	.	Good	.
144	NO	MOD	28-Apr-04	0	6	St. Avord	.	FULL	0	0	.	A/D	.	Exc	.
145	NO	MOD	29-Apr-04	2	15	Berlin GR	.	.	0	1	0	.	PFF	.	.
146	LT	NO	30-Apr-04	0	7	Lyon FR	GOOD	FULL	1	0	.	A/D	.	Exc	E/A=2, Me-109
147	NO	NO	1-May-44	24	0	N.W. France	BAD	.	0	0	.	V-Weapons	.	.	WX Abort
148	NO	MOD	1-May-44	1	6	Reims FR	.	.	0	0	.	M/Y	.	Exc	.
149	NO	MOD/INA	4-May-44	18	0	Berlin GR	BAD	.	0	0	.	.	.	.	Recalled
150	NO	MOD/INA	7-May-44	2	23	Berlin GR	10	.	0	0	.	.	PFF	.	.
151	NO	INA	8-May-44	30	30	Berlin GR	10	FULL	0	5	.	.	PFF	.	.
152	NO	L	9-May-44	0	18	Thionville FR	.	FULL	0	0	.	.	.	Exc	.
153	NO	MOD	11-May-44	1	23	Saarbrucken GR	GOOD	YES	0	1	.	Military Traffic Center	.	.	.
154	NO	LT/INA	12-May-44	2	23	Mersburg GR	.	YES	0	0	.	Synthetic Oil	.	.	.
155	LT	ACC	13-May-44	2	20	Stettin GR	Fair	YES	0	1	.	.	PFF	.	E/A=100 seen, but no attacks
156	NO	HVY/INA	19-May-44	1	19	Berlin GR	Fair	.	0	0	.	.	PFF	.	.
157	NO	LT	20-May-44	0	24	Orly FR	.	YES	0	.	.	.	.	Good	.
158	NO	MOD/ACC	22-May-44	1	17	Kiel GR	Lt	YES	0	.	.	Naval Arsenal & Deutsche Works	PFF	Good	.
159	NO	LT	23-May-44	1	20	Metz FR	BAD	.	0	.	1	.	PFF	.	.
160	YES	YES	24-May-44	0	22	Berlin GR	BAD	YES	0	1	1	.	PFF	.	E/A seen but no attacks
161	NO	NO	25-May-44	0	24	Thionville FR	.	FULL	0	.	.	M/Y	.	Exc	.
162	NO	LT	27-May-44	1	16	Mannheim GR	.	FULL	0	.	.	M/Y	Vis	.	.
163	NO	NO	27-May-44	0	10	Fe Camp FR	GOOD	AREA	0	.	.	Tactical	PFF	.	.
164	NO	ACC	28-May-44	2	32	Ruhland GR	.	PART	0	.	15	Synthetic Oil	PFF	.	Malf cause bombs dropped early

Mission #	E/A	FLAK	Date	# A/C Not Eff	# A/C Eff	Location	WX	Escort	# E/A Claims	# Loss	# A/C Damaged	Target	Bomb Method	Bomb Results	Remarks
165	LT	YES	29-May-44	3	16	Cottbus GR	BAD	PART	2	.	.	A/D & Acft assembly plant	.	Good	E/A mad 3 passes
166	NO	MOD	31-May-44	24	12	Liege BELGIUM	BAD	.	0	.	.	A/D	.	.	.
167	NO	NO	2-Jun-44	1	27	St. Cecily FR	10	.	0	.	.	Tactical-Gun emplacment	PFF	unk	.
168	NO	LT/ACC	2-Jun-44	0	15	Mass-Palaiseau FR	.	YES	0	.	.	Rail Bridge, M/Y, A/D	.	Good	.
169	NO	NO	3-Jun-44	0	17	St. Cecily FR	10	.	0	.	.	Tactical-Gun emplacment	PFF	.	.
170	NO	NO	4-Jun-44	1	11	Equihen FR	.	.	0	.	.	Tactical-Gun emplacment	.	Good	.
171	NO	NO	6-Jun-44	0	39	Arromanches FR	BAD	.	0	.	.	105mm gun & locally defended area	PFF	.	D-DAY
172	NO	NO	6-Jun-44	12	0	Caen FR	10	.	0	.	.	Road Junction	.	.	D-DAY; WX Abort due to PFF Malf
173	NO	NO	6-Jun-44	1	32	Thury-Harcourt FR	10	.	0	.	.	Bridge over Orne	PFF	.	D-DAY
174	NO	LT/INA	8-Jun-44	19	18	Rennes FR	BAD	.	0	.	.	A/D	.	.	.
175	NO	NO	11-Jun-44	46	2	Illiers L'Eveque FR	10	.	0	.	.	.	.	.	PFF Malf--Abort/RTB
176	NO	MOD	12-Jun-44	2	47	Lille/Vendeville FR	.	.	0	1	.	A/D	Vis	Good	Tgt: Also in Cambrai-Epinoy FR
177	NO	MOD	14-Jun-44	2	52	Etampes/Mon Desir FR	GOOD	FULL	0	.	.	A/D	Vis	Good	Tgt: also in Bretigny & Le Plessis Pate FR
178	NO	MOD	15-Jun-44	3	51	Nantes FR	GOOD	AREA	0	1	.	Rail Bridge	.	.	Esc=P-51
179	NO	MOD	17-Jun-44	9	31	Noyen FR	Fair	FULL	0	2	.	Bridge	PFF	.	PFF Malf cause 9 RTB; Esc=P-51
180	NO	HVY	18-Jun-44	18	18	Hamburg GR	5	FULL	0	.	.	Oil Refinery & Storage	PFF	.	PFF Malf cause 18 RTB; Esc=P38/51
181	NO	LT	19-Jun-44	54	0	NOBALL FR	10	.	0	.	.	V-Weapons	.	.	2 acft jettison Booby Traps in Channel?; WX Abort
182	NO	HVY/ACC	20-Jun-44	1	51	Hamburg GR	GOOD	FULL	0	1	.	Oil Plant & M/Y	Vis	Exc	.
183	YES	HVY	21-Jun-44	2	51	Berlin GR	Fair	PART	1	0	26	Industry	PFF	.	E/A=FW-190; Esc=P-38/51
184	NO	LT	22-Jun-44	4	46	Ghent BEL	GOOD	.	0	0	3	.	.	Exc	.
185	NO	MOD	24-Jun-44	0	40	Bremen GR	10	YES	0	0	YES	Bridge	PFF	.	.
186	NO	LT	25-Jun-44	1	47	Joigny FR	.	YES	0	0	.	.	.	.	.
187	NO	YES	26-Jun-44	1	35	Laon/Athies FR	.	YES	0	0	35	A/D	.	.	.
188	NO	LT	2-Jul-44	0	24	NOBALL FR	10	.	0	0	.	V-Weapons	PFF	.	.
189	NO	MOD	6-Jul-44	12	12	NOBALL FR	.	.	0	0	.	V-Weapons	.	Exc	12 Acft can't locate tgt & jettison "Booby Traps"
190	NO	MOD	7-Jul-44	4	30	Leipzig GR	.	.	0	0	.	FW-190 Plant	.	Good	.
191	NO	MOD	8-Jul-44	24	1	Corbie FR	10	.	0	0	YES	Rail Bridge	.	.	WX Abort
192	NO	LT/INA	9-Jul-44	0	24	Angers FR	Fair	FULL	0	0	.	Rail Bridge	.	.	Esc=P-51
193	NO	INA	11-Jul-44	2	35	Munich GR	10	FULL	0	0	.	.	PFF	.	Chaff used
194	NO	LT	12-Jul-44	0	17	Munich GR	10	YES	0	0	.	Bayerische Motor Works	PFF	unk	Chaff used
195	NO	MOD	13-Jul-44	2	33	Munich GR	GOOD	YES	0	0	18	M/Y	Vis	.	PFF Malf
196	NO	MOD	16-Jul-44	7	28	Munich GR	BAD	YES	0	1	.	.	PFF	.	.
197	NO	LT/INA	17-Jul-44	1	46	Hamm & Jussey FR	10	FULL	0	0	.	Bridges	.	.	.
198	NO	LT/INA	18-Jul-44	3	33	Peenemunde GR	GOOD	YES	0	1	.	V-Weapons	Vis	Good	.
199	LT	MOD/INA	19-Jul-44	0	11	Augsburg GR	BAD	YES	0	0	.	ME Factory	PFF	.	E/A=15 seen, but no attacks
200	NO	HVY/ACC	20-Jul-44	0	35	Kothen GR	BAD	.	0	2	YES	Junker Motor Works	Vis	.	PFF Damaged
201	NO	NO	21-Jul-44	1	34	Ebelsbach GR	GOOD	FULL	0	0	.	Ball Bearing Plants	Vis	.	.
202	NO	ACC	22-Jul-44	0	4	Bremen/Kiel/Hamburg GR	.	.	0	0	.	.	PFF	.	Dropped leaflets to inform Germans of assassination attempt on Hitler
203	NO	NO	24-Jul-44	12	42	St. Lo Area FR	Fair	YES	0	0	.	German lines	.	Good	Esc=P-51/38
204	NO	NO	25-Jul-44	0	54	St. Lo Area FR	BAD	.	0	0	.	German lines	.	Good	.
205	NO	INA	28-Jul-44	2	34	Merseburg GR	10	FULL	0	0	.	I.G. Farben Industries Oil Refinery	PFF	.	Used Chaff

Mission #	E/A	FLAK	Date	# A/C Not Eff	# A/C Eff	Location	WX	Escort	# E/A Claims	# Loss	# A/C Damaged	Target	Bomb Method	Bomb Results	Remarks
206	NO	LT/INA	31-Jul-44	2	34	Munich GR	10	YES	0	0	.	.	PFF	unk	.
207	NO	YES	3-Aug-44	0	36	Merkwiller FR	3	.	0	0	10	Synthetic Oil	Vis	.	.
208	NO	UNK	4-Aug-44	0	36	Anklam GR	GOOD	.	0	0	.	A/D & Fighter/component plant	Vis	Good	.
209	NO	UNK	5-Aug-44	1	36	Dollbergen GR	.	.	0	0	.	Oil Refinery	.	.	.
210	UNK	UNK	6-Aug-44	0	49	Brandenburg GR	.	.	0	0	.	A/D & Motor works	.	.	.
211	NO	LT	7-Aug-44	1	43	Montbartier-Loubes FR	GOOD	.	0	0	.	Oil Storage	.	.	.
212	UNK	YES	8-Aug-44	25	23	Caen FR	.	.	0	1	.	Tactical-German lines	.	.	.
213	UNK	UNK	9-Aug-44	1	32	Ulm GR	BAD	.	0	0	.	.	PFF	.	.
214	UNK	UNK	12-Aug-44	0	36	Chamant FR	GOOD	.	0	0	.	A/D	.	Exc	.
215	UNK	MOD	13-Aug-44	0	36	Rouen FR	.	.	0	0	.	Tactical-road junction	.	Good	.
216	UNK	UNK	14-Aug-44	0	36	Florence & Chevres FR	GOOD	.	0	0	.	A/D	.	Good	.
217	YES	UNK	15-Aug-44	2	28	Frankfurt/Eschborn GR	.	.	0	0	.	A/D	.	Good	.
218	UNK	UNK	16-Aug-44	3	35	Bohlen GR	.	.	0	2	.	Synthetic Oil	.	.	.
219	UNK	HVY	24-Aug-44	3	33	Merseburg & Vorden GR	.	.	0	0	.	A/D & I.G. Farben Synthetic Oil	.	.	.
220	UNK	HVY	25-Aug-44	4	32	Peenemunde/Parrow GR	.	.	0	0	YES	V-Weapons & Stralsund A/D	.	.	.
221	UNK	HVY	26-Aug-44	24	12	Gelsenkirchen GR	Haze	.	0	1	.	.	.	.	21 acft abort for WX
222	UNK	UNK	27-Aug-44	0	24	Wilhemshaven GR	10	.	0	0	.	.	PFF	.	.
223	UNK	INA	30-Aug-44	0	36	Kiel GR	10	.	0	0	.	Shipyard	PFF	.	.
224	UNK	MOD	3-Sep-44	0	36	Ludwigshaven GR	10	.	0	0	.	I.G. Farben Industries	PFF	.	.
225	UNK	UNK	5-Sep-44	1	34	Ludwigshaven GR	.	.	0	0	.	Chemical plant	PFF	Poor	.
226	UNK	UNK	8-Sep-44	5	31	Ludwigshaven GR	.	.	0	0	.	Industries	PFF	unk	.
227	UNK	UNK	10-Sep-44	2	34	Stuttgart GR	GOOD	.	0	0	.	.	Vis	.	.
228	YES	UNK	11-Sep-44	3	35	Eisenach/Lutzkendorf GR	.	.	0	1	.	.	PFF	Exc	.
229	YES	HVY	12-Sep-44	1	35	Ruhland GR	GOOD	.	1	9	.	Oil Reserves	Vis	.	E/A=25 FW-190
230	UNK	UNK	13-Sep-44	0	24	Merseburg GR	.	.	0	1	.	Synthetic Oil	.	unk	.
231	UNK	UNK	17-Sep-44	0	34	Volkel Area HOL	.	.	0	0	.	Tactical	.	.	.
232	UNK	UNK	19-Sep-44	2	22	Unna GR	.	.	0	0	.	.	.	.	.
233	UNK	UNK	22-Sep-44	0	24	Kassel GR	.	.	0	0	.	.	.	.	.
234	UNK	UNK	25-Sep-44	0	37	Frankfurt GR	.	.	0	0	.	.	.	.	.
235	UNK	UNK	27-Sep-44	1	36	Cologne GR	.	.	0	0	.	.	.	.	.
236	UNK	UNK	28-Sep-44	0	41	Magdeburg GR	.	.	0	0	.	.	.	.	.
237	UNK	UNK	30-Sep-44	3	23	Munster GR	.	.	0	0	.	.	.	.	.
238	NO	LT/INA	2-Oct-44	0	37	Kassel GR	8	YES	0	0	.	Henschel & Sohn Trans Works	PFF	.	Esc=P-47/51
239	NO	LT/INA	3-Oct-44	1	24	Nurnberg GR	9	FULL	0	0	.	.	PFF	Poor	Used Chaff
240	NO	MOD/INA	5-Oct-44	1	23	Koln & Koblenz GR	10	YES	0	0	.	Ford Motor Co. & M/Y	PFF	.	Esc=P-47/51; Used Chaff
241	NO	NO	6-Oct-44	1	47	Stralsund & Stargard GR	8	.	0	0	.	Electric Power & A/D	PFF	.	.
242	LT	LT	7-Oct-44	0	36	Ruhland GR	Fair	.	0	0	.	Synthetic Oil	Vis	.	E/A=3 seen, but no attacks
243	NO	LT	9-Oct-44	1	37	Schweinfurt GR	10	YES	0	0	.	Ball Bearing Plants	PFF	Exc	Esc=P-47/51; Used Chaff
244	NO	HVY/ACC	14-Oct-44	2	37	Cologne GR	10	YES	0	0	5	Locomotive Depot & M/Y	PFF	.	.
245	NO	HVY/ACC	15-Oct-44	0	25	Cologne GR	5	.	0	2	YES	.	PFF	.	.
246	NO	MOD	17-Oct-44	0	36	Cologne GR	.	.	0	0	7	M/Y	Vis	.	.

Mission #	E/A	FLAK	Date	# A/C Not Eff	# A/C Eff	Location	WX	Escort	# E/A Claims	# Loss	# A/C Damaged	Target	Bomb Method	Bomb Results	Remarks
247	NO	MOD	19-Oct-44	0	24	Mannheim GR	BAD	PART	0	0	23	Ordnance Depot	PFF	.	Test against captured Ger radar using chaff & razzle/dazzle manuever
248	NO	MOD	22-Oct-44	2	34	Hannover GR	10	PART	0	2	.	Hannoversche Machinbau A.G.	PFF	.	Used chaff
249	NO	MOD	25-Oct-44	1	35	Hamburg GR	10	.	0	0	.	Oil Refinery	PFF	.	Used chaff
250	NO	NO	26-Oct-44	2	36	Bielefeld GR	10	FULL	0	0	.	Ordnance Storage Depot	PFF	.	12 acft flew using chaff & razzle dazzle technique; Esc=P-51
251	NO	YES	30-Oct-44	12	24	Munster GR	.	PART	0	0	.	Rail Center	PFF	.	12 Acft abort due to PFF malf; Esc=P-47/51 abort due to WX
252	NO	MOD	2-Nov-44	0	24	Merseburg GR	9	FULL	0	0	11	Synthetic Oil	PFF	.	Used chaff
253	NO	LT/INA	4-Nov-44	1	35	Harburg GR	10	FULL	0	0	0	Oil Ref (Rhenania-Ossag Mineral Works)	PFF	.	Esc=P-51
254	NO	LT	5-Nov-44	0	36	Frankfurt GR	Fair	YES	0	0	.	M/Y	Vis	Exc	.
255	NO	YES	6-Nov-44	0	36	Hamburg GR	9	YES	0	0	.	M/Y	PFF	.	.
256	YES	MOD	8-Nov-44	26	22	Merseburg GR	10	NO	0	0	.	Leuna Works	PFF	.	E/A=Me-109/410; 26 acft WX abort; screen force lead by dropping chaff
257	UNK	NO	9-Nov-44	1	35	Metz FR	8	.	0	0	.	Tactical-Ground Support/Guns	Gee-H	Exc	Used balloons, flares & CSC-51 radar to delineate friendly troops
258	NO	UNK	16-Nov-44	1	50	Eschweiler Area GR	.	YES	0	0	.	Tactical	Gee-H/PFF	.	Used balloons, flares & CSC-51 radar to show friendly troops; Esc=P-51
259	NO	YES	21-Nov-44	3	47	Meppen/Leeuwarden GR	GOOD	YES	0	1	.	Bridges, Railroads & M/Y	.	.	Screen force drops chaff; flak mounted on rail
260	NO	MOD	26-Nov-44	1	47	Misburg GR	.	.	0	0	8	Gerwerkschaft Deutsche Erdol Reffinerie	PFF	.	.
261	NO	LT/INA	29-Nov-44	3	33	Misburg GR	10	FULL	0	0	0	Oil Refinery	PFF	.	.
262	NO	HVY	30-Nov-44	0	36	Gera GR	Smoke	YES	0	1	.	Weinrich Leo Air Compr Plant & M/Y	.	.	.
263	NO	LT	2-Dec-44	11	27	Koblenz GR	10	.	0	0	0	.	Gee-H/PFF	.	11 acft abort due to Gee-H Malf; Chaff used
264	UNK	MOD/ACC	5-Dec-44	3	33	Berlin GR	10	.	0	2	8	Armament Works	PFF	.	.
265	NO	MOD/INA	6-Dec-44	0	36	Merseburg GR	10	.	0	0	4	.	PFF	.	Used chaff
266	UNK	LT/ACC	9-Dec-44	2	34	Stuttgart GR	10	YES	0	1	4	M/Y	Gee-H/PFF	.	.
267	NO	NO	11-Dec-44	0	48	Frankfurt GR	10	.	0	0	0	M/Y	PFF	.	.
268	NO	MOD/INA	12-Dec-44	0	37	Merseburg GR	10	.	0	0	0	I.G. Farben Industries Synthetic Oil	PFF	.	.
269	NO	LT	15-Dec-44	0	36	Kassel GR	10	.	0	2	.	M/Y	PFF	.	.
270	NO	NO	18-Dec-44	0	39	Kaiserslautern GR	10	.	0	0	.	M/Y	PFF	.	.
271	NO	LT	24-Dec-44	0	49	Nidda & Giessen GR	GOOD	.	0	0	6	A/D	Vis	Exc	.
272	NO	NO	28-Dec-44	1	37	Siegburg & Koblenz GR	10	.	0	1	.	M/Y	Gee-H/PFF	.	.
273	NO	LT	29-Dec-44	1	35	Bingen GR	.	.	0	1	11	M/Y	Gee-H/PFF	.	.
274	NO	LT/INA	30-Dec-44	0	36	Mainz GR	10	.	0	0	0	.	PFF	.	.
275	NO	INA	1-Jan-45	2	34	Limburg & Kassel GR	10	YES	0	1	10	M/Y	PFF	.	E/A seen but no attacks; chaff used

Mission #	E/A	FLAK	Date	# A/C Not Eff	# A/C Eff	Location	WX	Escort	# E/A Claims	# Loss	# A/C Damaged	Target	Bomb Method	Bomb Results	Remarks
276	NO	LT	2-Jan-45	2	37	Kyllburg GR	GOOD	AREA	0	0	3	Communications, Rail Tunnel	Vis	Exc	.
277	NO	NO	3-Jan-45	1	37	Hermulheim GR	10	.	0	0	.	M/Y	Gee-H/PFF	.	.
278	NO	LT	5-Jan-45	10	27	Niedermendig GR	10	PART	0	0	0	Airfield	Gee-H/PFF	.	10 acft abort due to rack malf
279	NO	LT	6-Jan-45	0	38	Cologne GR	10	YES	0	0	0	M/Y	Gee-H/PFF	.	Esc=P-47/51
280	NO	NO	7-Jan-45	0	39	Euskirchen GR	BAD	FULL	0	0	.	Rail lines	Gee-H/PFF	.	Esc=P-51
281	NO	MOD/ACC	8-Jan-45	3	35	Speyer GR	BAD	AREA	0	0	19	Comm Center	PFF	.	.
282	UNK	MOD/ACC	10-Jan-45	9	29	Gymnich GR	Fair	NO	0	1	20	A/D	Vis	.	9 acft abort due to lead damaged & Gee-H malf
283	NO	MOD/ACC	14-Jan-45	2	33	Cologne GR	GOOD	AREA	0	0	25	Hohenzollern Rail Bridge	Vis	Exc	.
284	NO	LT/INA	15-Jan-45	1	35	Freiburg GR	10	AREA	0	0	.	M/Y	PFF	.	.
285	NO	NO	17-Jan-45	1	37	Bielefeld GR	10	YES	0	0	.	Rail viaduct	Gee-H/PFF	.	.
286	NO	LT	20-Jan-45	4	33	Rheine GR	10	YES	0	0	2	M/Y	Micro-H/PFF	.	.
287	NO	NO	21-Jan-45	2	36	Aschaffenburg GR	.	YES	0	0	.	M/Y	PFF	.	Esc=P-51; PFF bombing due to Gee-H malf
288	NO	MOD	28-Jan-45	0	39	Cologne GR	Haze	AREA	0	0	11	M/Y	Gee-H/PFF	.	Incendiary Flak
289	NO	NO	29-Jan-45	1	35	Koblenz GR	10	FULL	0	0	.	M/Y	PFF	.	.
290	NO	LT	1-Feb-45	1	38	Mannheim GR	10	.	0	0	.	Rhine Bridge	PFF	.	Micro-H failed to identify tgt
291	NO	HVY/ACC	3-Feb-45	1	41	Berlin GR	GOOD	.	0	3	17	City admin area	Vis	Exc	Reported larger than normal flak bursts; chaff used
292	NO	LT/ACC	6-Feb-45	5	31	Fulda GR	10	.	0	0	3	Tgt of Opportunity	PFF	.	PFF Malf
293	NO	MOD/INA	9-Feb-45	1	35	Lutzkendorf GR	7	.	0	0	7	Oil Refinery	Vis	.	.
294	UNK	LT/INA	10-Feb-45	1	38	Dulmen GR	10	.	0	0	3	M/Y	micro-H	.	Intermittent PFF & Micro-H problems
295	LT	LT/INA	14-Feb-45	0	39	Dresden GR	10	PART	1	2	4	M/Y	PFF	.	Esc=P-51; E/A=3 FW-190
296	NO	MOD	16-Feb-45	0	39	Dortmund GR	GOOD	.	0	0	8	Coking Plant	Vis	Exc	.
297	NO	MOD/INA	19-Feb-45	2	37	Bochum & Munster GR	10	.	0	0	2	Coking Plant & M/Y	Gee-H/PFF	.	.
298	NO	MOD/ACC	20-Feb-45	4	32	Nurnberg GR	9	.	0	0	11	M/Y	PFF	.	4 acft abort for WX
299	NO	LT/ACC	21-Feb-45	0	36	Nurnberg GR	10	.	0	0	9	M/Y	PFF	.	.
300	LT	NO	22-Feb-45	0	36	Wittstock GR	GOOD	.	0	0	.	Rail Junction	Vis	.	E/A=2 Me-262 seen, but no attack
301	NO	NO	23-Feb-45	0	39	Plauen GR	10	.	0	0	.	M/Y	PFF	.	.
302	NO	MOD/INA	24-Feb-45	1	29	Hamburg GR	10	.	0	0	1	Oil Depot	PFF	.	Tested use of new 10 acft sqdn formation
303	NO	MOD/INA	26-Feb-45	1	38	Berlin GR	10	.	0	0	3	M/Y	PFF	.	H2X malf on high group
304	NO	NO	27-Feb-45	1	35	Leipzig GR	10	.	0	0	.	Rail Station	PFF	.	Used spot jamming on Flak
305	NO	NO	28-Feb-45	0	36	Hagen GR	10	.	0	0	.	M/Y	Gee-H	.	.
306	NO	LT	1-Mar-45	.	36	Neckarsulm GR	7	.	0	0	0	M/Y	Gee-H/Vis	.	.
307	NO	MOD	2-Mar-45	.	36	Bohlen GR	7	.	0	0	6	Oil Plant & M/Y	Vis	.	.
308	NO	LT	4-Mar-45	.	36	Ulm GR	10	.	0	0	.	Ordnance Depot	Gee-H/PFF	.	.

Mission #	E/A	FLAK	Date	# A/C Not Eff	# A/C Eff	Location	WX	Escort	# E/A Claims	# Loss	# A/C Damaged	Target	Bomb Method	Bomb Results	Remarks
309	NO	NO	7-Mar-45	.	39	Giessen & Siegen GR	10	.	0	0	2	M/Y	Gee-H/PFF	.	.
310	NO	LT/INA	8-Mar-45	.	39	Gelsenkirchen GR	10	.	0	0	0	Synthetic Oil	Gee-H	.	.
311	NO	MOD/INA	10-Mar-45	.	39	Dortmund GR	10	.	0	0	1	.	PFF	.	.
312	NO	INA	11-Mar-45	.	36	Bremen GR	10	.	0	0	.	Sub Construction	PFF	.	.
313	NO	LT/INA	12-Mar-45	.	36	Swinemunde GR	10	.	0	0	.	Dock area	PFF	.	.
314	NO	LT	14-Mar-45	.	36	Hildesheim GR	GOOD	.	0	0	1	Jet component plant	Vis	Exc	.
315	NO	NO	15-Mar-45	.	36	Zossen GR	Smoke	.	0	0	.	Military HQs	Vis	.	.
316	NO	MOD	17-Mar-45	.	36	Molbis	10	.	0	0	2	Power Plant	PFF	Exc	.
317	Lt	MOD/ACC	18-Mar-45	.	36	Berlin GR	5	.	1	0	33	M/Y	PFF/Vis	.	E/A=2 Me-262 & Me-109
318	NO	LT/INA	19-Mar-45	.	36	Plauen GR	Haze	.	0	0	.	M/Y	PFF/Vis	.	.
319	NO	NO	21-Mar-45	.	36	Rheine GR	GOOD	.	0	0	.	Airfield dispersal area	Vis	.	.
320	NO	LT/INA	22-Mar-45	.	39	Dorsten	GOOD	.	0	0	4	Mil Camp, power plant, oil refinery	Vis	.	E/A=FW-190 seen, but no attacks
321	NO	LT/INA	23-Mar-45	.	36	Coesfeld	GOOD	.	0	0	0	Tranportation center& M/Y	Vis	.	.
322	NO	LT/INA	24-Mar-45	.	48	Vechta & Hespe	GOOD	.	0	0	.	A/D	Vis	.	.
323	NO	LT/INA	24-Mar-45	.	13	Twente HOL	GOOD	.	0	0	0	A/D	Vis	.	.
324	NO	LT/INA	28-Mar-45	.	36	Berlin GR	10	.	0	0	0	Motor Works	PFF	.	.
325	NO	MOD/ACC	30-Mar-45	.	49	Bremen & Farge GR	Fair	.	0	0	26	Road bridge & Sub Pens	Vis	Exc	"Disney Bombs" used at Farge
326	NO	LF	31-Mar-45	.	40	Halle	10	.	0	0	3	M/Y	PFF	.	10 acft sqdn formation used
327	NO	LT/INA	3-Apr-45	1	47	Kiel GR	10	FULL	0	0	0	Sub Construction	PFF	.	Mosquitos dropped chaff as screen force
328	NO	NO	4-Apr-45	YES?	36	Fassberg GR	8	FULL	0	0	0	Airfield	.	.	E/A seen pursued by P-51; several acft abort for WX
329	NO	NO	5-Apr-45	.	36	Weiden GR	9	YES	0	0	0	.	PFF	.	E/A seen pursued by P-51
330	NO	LT/INA	6-Apr-45	.	38	Leipzig GR	10	.	0	0	0	Rail Station	PFF	Exc	.
331	NO	LT	7-Apr-45	.	36	Wesendorf GR	6	AREA	0	0	0	Airfield Installations	Vis	Exc	.
332	NO	NO	8-Apr-45	.	36	Halberstadt GR	5	PART	0	0	.	M/Y	PFF/Vis	.	.
333	NO	ACC	10-Apr-45	.	36	Oranienburg GR	GOOD	PART	0	1	11	Airfield Installations	Vis	Exc	.
334	NO	LT	11-Apr-45	.	36	Kraiburg GR	GOOD	.	0	0	4	High Explosives Factory	Vis	Good	.
335	NO	NO	13-Apr-45	.	36	Neumunster GR	.	YES	0	0	0	M/Y	Vis	Fair	.
336	NO	NO	14-Apr-45	.	36	Royan Area FR	.	NO	0	0	0	Tactical-Gun positions	Vis	Fair	.
337	NO	NO	15-Apr-45	.	39	Royan Area FR	GOOD	NO	0	0	0	Tactical-Gun positions	Vis	Good	.
338	NO	NO	16-Apr-45	.	38	Plattling GR	GOOD	.	0	0	0	M/Y	Vis	Exc	.
339	NO	MOD	17-Apr-45	5	34	Dresden GR	Fair	.	0	0	4	M/Y	PFF/Vis	.	7 acft drop bombs at wrong time due to poor visibiity
340	NO	LT/INA	18-Apr-45	.	39	Rosenheim GR	5	.	0	0	2	M/Y Transformer & switching station	Vis	Exc	.
341	NO	LT	19-Apr-45	.	38	Falkenberg GR	GOOD	FULL	0	0	1	M/Y	Vis	Exc	No more combat missions--only leaflet missions past this date

Appendix B

Graphs and Tables for 306th Bomb Group

Table 4. 306th Bomb Group Monthly Summary

	# of Missions	% Not Effective	# A/C Not Eff	% Effective Sorties	# A/C Eff	Ave # Claims per Mission	# E/A Claims per Month	% Losses	# Loss	# A/C Damaged
Oct-42	1	0.17	4	0.83	20	10.00	10	5.00	1	19
Nov-42	11	0.40	67	0.60	102	4.36	48	9.80	10	13
Dec-42	0	0.00	0	0.00	0	0.00	0	0.00	0	0
Jan-43	4	0.12	8	0.88	59	0.50	2	6.78	4	1
Feb-43	6	0.41	45	0.59	64	1.50	9	3.13	2	0
Mar-43	9	0.24	43	0.76	134	2.22	20	2.99	4	1
Apr-43	4	0.15	14	0.85	82	5.75	23	17.07	14	0
May-43	8	0.11	20	0.89	165	8.00	64	4.85	8	1
Jun-43	7	0.33	36	0.67	74	3.00	21	4.05	3	0
Jul-43	8	0.31	58	0.69	130	4.88	39	6.92	9	17
Aug-43	8	0.20	32	0.80	132	2.25	18	0.76	1	35
Sep-43	8	0.07	10	0.93	131	0.50	4	1.53	2	31
Oct-43	7	0.15	19	0.85	105	3.71	26	13.33	14	20
Nov-43	5	0.12	12	0.88	91	0.00	0	6.59	6	0
Dec-43	10	0.16	36	0.84	189	0.70	7	2.65	5	29
Jan-44	8	0.20	51	0.80	209	3.13	25	3.35	7	12
Feb-44	12	0.30	100	0.70	233	1.00	12	7.73	18	95
Mar-44	16	0.27	112	0.73	309	0.19	3	1.94	6	52
Apr-44	14	0.14	43	0.86	260	0.14	2	5.00	13	46
May-44	20	0.24	113	0.76	355	0.10	2	2.25	8	17
Jun-44	21	0.22	177	0.78	630	0.05	1	0.79	5	64
Jul-44	19	0.12	72	0.88	531	0.00	0	0.75	4	18
Aug-44	17	0.10	64	0.90	563	0.00	0	0.71	4	10
Sep-44	14	0.04	18	0.96	446	0.07	1	2.47	11	0
Oct-44	14	0.05	23	0.95	455	0.00	0	0.88	4	35
Nov-44	11	0.08	36	0.92	401	0.00	0	0.50	2	19
Dec-44	12	0.04	18	0.96	447	0.00	0	1.57	7	33
Jan-45	15	0.07	38	0.93	524	0.00	0	0.38	2	90
Feb-45	16	0.03	18	0.97	579	0.06	1	0.86	5	68
Mar-45	21	0.00	0	1.00	774	0.05	1	0.00	0	78
Apr-45	15	0.01	6	0.99	561	0.00	0	0.18	1	22
TOTALS	341	0.13	1293	0.87	8755	0.99	339	2.06	180	826

Source: Monthly War Diary, GP-306-HI, in USAF Collection, AFHRA, Oct 42-Apr 45

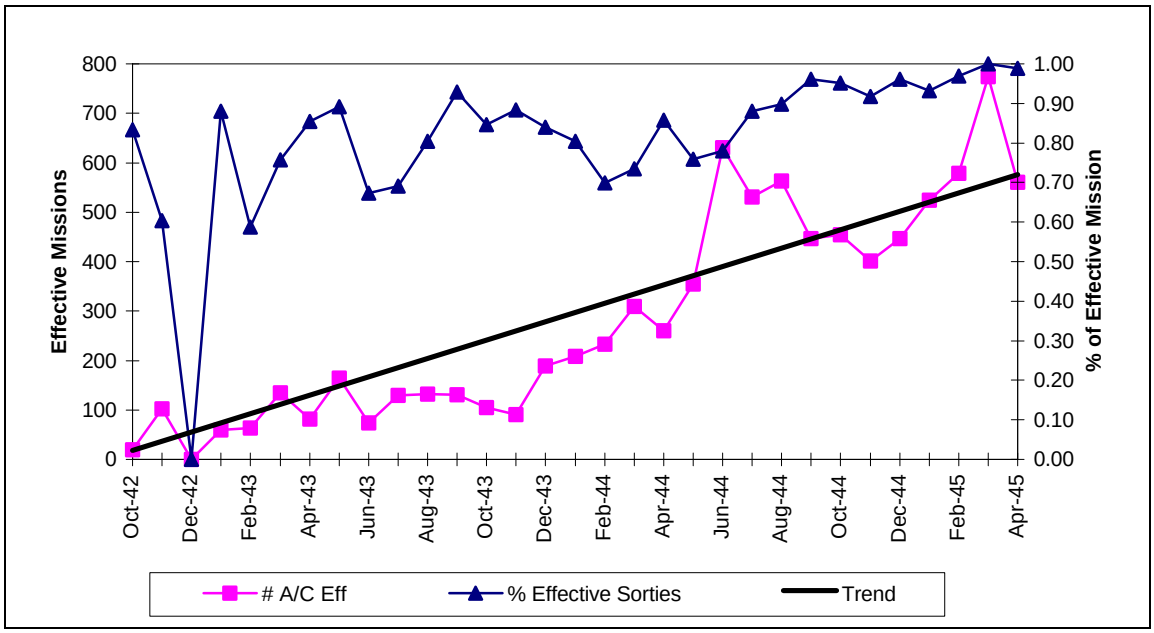

Figure 14. Mission Effectiveness for the 306th Bomb Group

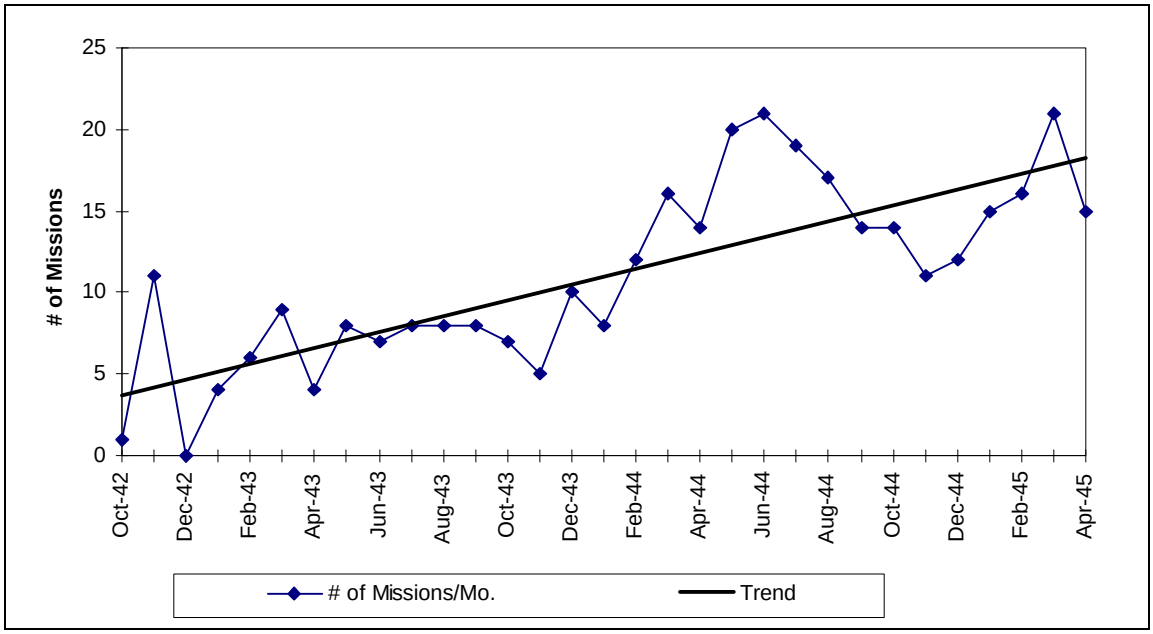

Figure 15. Number of Missions per Month for the 306th

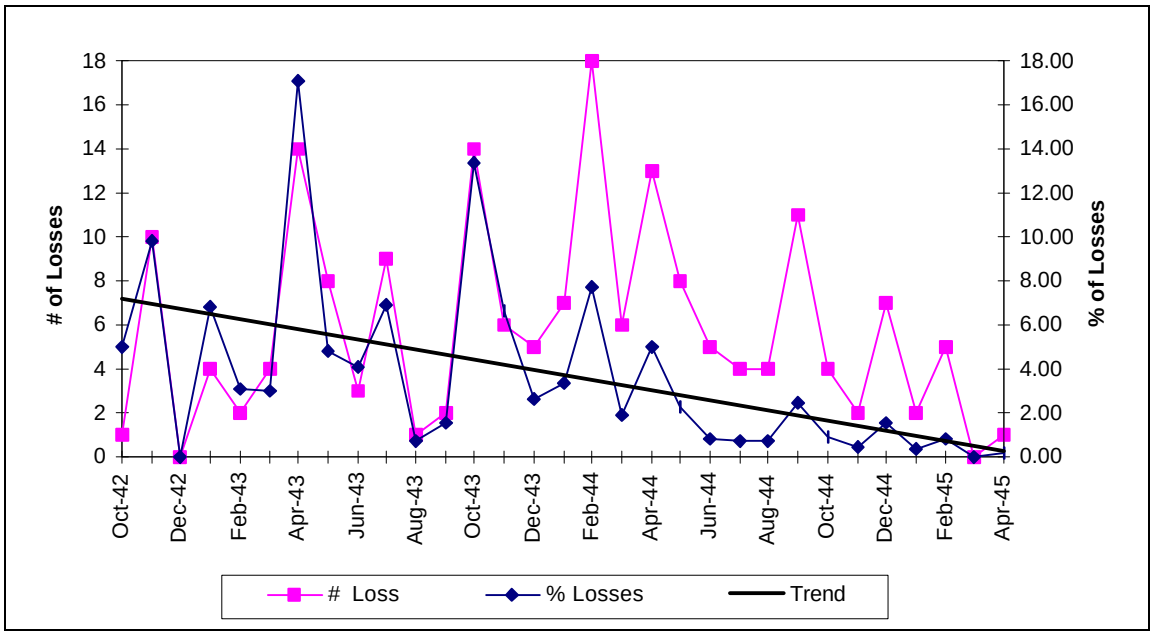

Figure 16. Analysis of the 306th's Losses

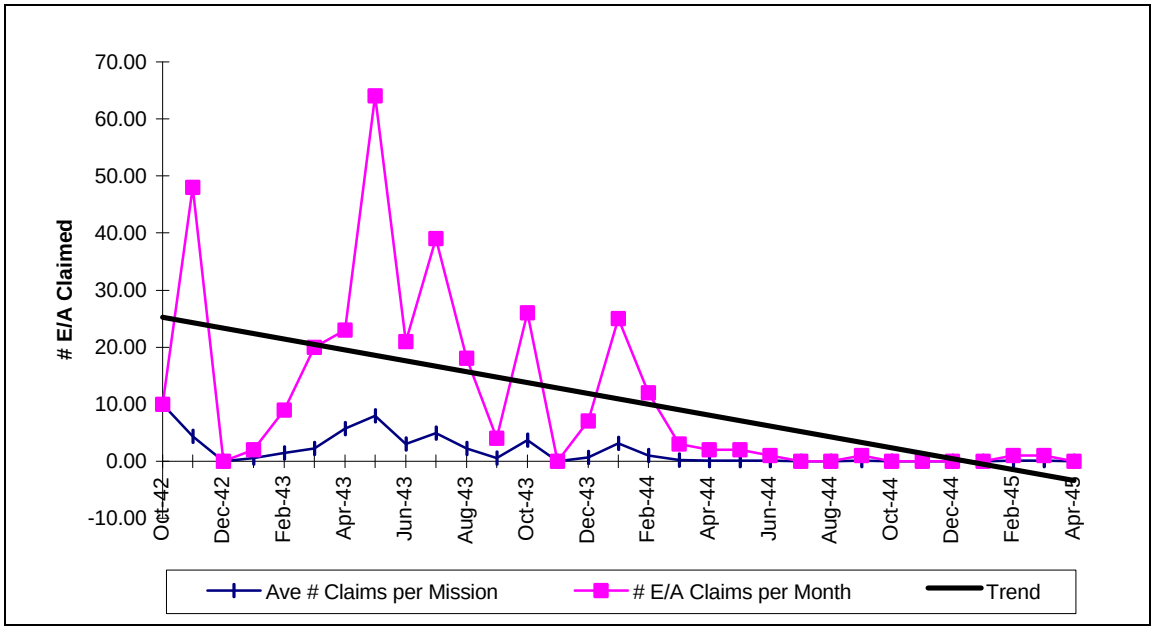

Figure 17. Analysis of 306th's Enemy Claims

Appendix C

Comparison Graphs and Tables

The source for data on the 306th Bomb Group is the 306th's *War Diaries*, (Call Letters: GP-306-HI, Oct 42-May 45), located at the AFHRA. Data for the Eighth Air Force, comes from the *Army Air Forces Statistical Digest: World War II*. Numbers enclosed in brackets, [ ], indicate a corresponding table number from the *Army Air Forces Statistical Digest*. The following provides an explanation of the each column of the in the preceding table:

Column A: Date
Column B: Col E/(Col E + Col R)* 100
Column C: (Col F/Col S)*100
Column D: Col F/Col Q; Number of effective sorties dividing by number of heavy bomber groups in the Eighth Air Force
Column E: Number of effective sorties
Column F: Number of effective sorties, includes B-17s and B-24s
Column G: Col I/Col Q; Number of enemy claims divided by the number of heavy bomber groups in the Eighth Air Force
Column H: Number of enemy aircraft claims by the 306th
Column I: Number of enemy aircraft claims by heavy bombers in the Eighth Air Force
Column J: (Col M/Col E)*100; Number of losses per effective sortie
Column K: (Col N/Col F)*100; Number of losses per effective sortie
Column L: Col N/Col Q; Number of losses divided by the number of heavy bomber groups in the Eighth Air Force
Column M: Number of aircraft lost by the 306th
Column N: Number of heavy bombers lost by the Eighth Air Force
Column O: Number of claims per effective sortie
Column P: Number of claims per effective sortie

Column Q: Number of heavy bombers groups assigned to the Eighth Air Force (Source: *Statistical Summary of Eighth Air Force Operations: European Theater, 17 Aug 1942 - 8 May 1945*, 520.308A, in USAF Collection, AFHRA)

Column R: Number of sorties not effective

Column S: Total number of heavy bomber sorties (effective and non-effective)

Table 5. Comparison of the 306th BG and Eighth Air Force

	% Effective Sorties (306)	% Effective Sorties (ETO)	Normalized Eff Hvy Bomber Sorties (ETO) [119]	# A/C Eff (306)	Eff Hvy Bomber Sorties (ETO) [119]	Normalized Claimed Enemy Acft Destroyed by Hvy Bombers (ETO) [167]	# E/A Claims (306)	Claimed Enemy Acft Destroyed by Hvy Bombers (ETO) [167]	% Losses (306)	% Losses (ETO)	Normalized Hvy Bomber Combat Losses (ETO) [159]	# Loss (306)	Hvy Bomber Combat Losses (ETO) [159]	# E/A Claimed per Effective Sortie (306)	# E/A Claimed per Effective Sortie (ETO)	# of Heavy Bomber Groups in ETO [8th Summary]	# A/C Not Eff (306)	Hvy Bomber Sorties (ETO) [119]
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
Oct-42	83.33	50.35	28.6	20	143	8.8	10	44	5.00	6.99	2.0	1	10	0.5	0.308	5	4	284
Nov-42	60.36	52.22	38.7	102	271	6.7	48	47	9.80	4.80	1.9	10	13	0.471	0.173	7	67	519
Dec-42	0.00	46.74	33.0	0	165	10.6	0	53	0.00	10.30	3.4	0	17	0	0.321	5	0	353
Jan-43	88.06	65.09	36.7	59	220	7.5	2	45	6.78	8.18	3.0	4	18	0.034	0.205	6	8	338
Feb-43	58.72	59.51	52.2	64	313	12.0	9	72	3.13	7.35	3.8	2	23	0.141	0.23	6	45	526
Mar-43	75.71	86.09	137.2	134	823	23.7	20	142	2.99	2.55	3.5	4	21	0.149	0.173	6	43	956
Apr-43	85.42	77.73	58.2	82	349	24.3	23	146	17.07	8.31	4.8	14	29	0.28	0.418	6	14	449
May-43	89.19	87.98	122.6	165	1,471	31.0	64	372	4.85	4.69	5.8	8	69	0.388	0.253	12	20	1,672
Jun-43	67.27	60.18	97.5	74	1,268	22.5	21	293	4.05	7.10	6.9	3	90	0.284	0.231	13	36	2,107
Jul-43	69.15	61.61	116.2	130	1,743	35.1	39	527	6.92	6.77	7.9	9	118	0.3	0.302	15	58	2,829
Aug-43	80.49	81.68	110.4	132	1,850	23.9	18	401	0.76	6.32	7.0	1	117	0.136	0.217	16.75	32	2,265
Sep-43	92.91	75.39	118.4	131	2,457	12.3	4	255	1.53	3.99	4.7	2	98	0.031	0.104	20.75	10	3,259
Oct-43	84.68	74.78	102.0	105	2,117	38.1	26	791	13.33	8.79	9.0	14	186	0.248	0.374	20.75	19	2,831
Nov-43	88.35	62.09	118.7	91	2,581	4.9	0	106	6.59	3.68	4.4	6	95	0	0.041	21.75	12	4,157
Dec-43	84.00	82.66	191.7	189	4,937	9.0	7	231	2.65	3.48	6.7	5	172	0.037	0.047	25.75	36	5,973
Jan-44	80.38	78.95	191.5	209	5,027	22.2	25	582	3.35	4.04	7.7	7	203	0.12	0.116	26.25	51	6,367
Feb-44	69.97	76	248.3	233	7,512	13.1	12	397	7.73	3.61	9.0	18	271	0.052	0.053	30.25	100	9,884
Mar-44	73.40	75.69	287.6	309	8,773	11.9	3	363	1.94	3.93	11.3	6	345	0.01	0.041	30.5	112	11,590
Apr-44	85.81	68.76	315.7	260	9,945	11.0	2	346	5.00	4.22	13.3	13	420	0.008	0.035	31.5	43	14,464
May-44	75.85	70.49	363.0	355	13,975	9.9	2	380	2.25	2.69	9.8	8	376	0.006	0.027	38.5	113	19,825
Jun-44	78.07	78.52	560.8	630	22,713	1.0	1	42	0.79	1.41	7.9	5	320	0.002	0.002	40.5	177	28,925
Jul-44	88.06	78.87	465.8	531	18,864	2.4	0	98	0.75	1.87	8.7	4	352	0	0.005	40.5	72	23,917

	% Effective Sorties (306)	% Effective Sorties (ETO)	Normalized Eff Hvy Bomber Sorties (ETO) [119]	# A/C Eff (306)	Eff Hvy Bomber Sorties (ETO) [119]	Normalized Claimed Enemy Acft Destroyed by Hvy Bombers (ETO) [167]	# E/A Claims (306)	Claimed Enemy Acft Destroyed by Hvy Bombers (ETO) [167]	% Losses (306)	% Losses (ETO)	Normalized Hvy Bomber Combat Losses (ETO) [159]	# Loss (306)	Hvy Bomber Combat Losses (ETO) [159]	# E/A Claimed per Effective Sortie (306)	# E/A Claimed per Effective Sortie (ETO)	# of Heavy Bomber Groups in ETO [8th Summary]	# A/C Not Eff (306)	Hvy Bomber Sorties (ETO) [119]
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
Aug-44	89.79	82.57	468.2	563	18,964	0.6	0	23	0.71	1.75	8.2	4	331	0	0.001	40.5	64	22,967
Sep-44	96.12	85.49	385.6	446	15,617	1.6	1	65	2.47	2.39	9.2	11	374	0.002	0.004	40.5	18	18,268
Oct-44	95.19	89.39	421.2	455	17,058	0.3	0	12	0.88	1.04	4.4	4	177	0	7E-04	40.5	23	19,082
Nov-44	91.76	89.66	385.9	401	15,245	0.7	0	29	0.50	1.37	5.3	2	209	0	0.002	39.5	36	17,003
Dec-44	96.13	89.98	418.4	447	16,424	1.6	0	61	1.57	0.72	3.0	7	119	0	0.004	39.25	18	18,252
Jan-45	93.24	88.31	375.8	524	14,750	1.0	0	41	0.38	2.13	8.0	2	314	0	0.003	39.25	38	16,702
Feb-45	96.98	87.1	507.8	579	19,933	0.0	1	1	0.86	0.98	5.0	5	196	0.002	5E-05	39.25	18	22,884
Mar-45	100.00	92.41	733.9	774	28,804	0.6	1	23	0.00	0.92	6.8	0	266	0.001	8E-04	39.25	0	31,169
Apr-45	98.94	88.62	475.3	561	18,180	2.4	0	92	0.18	1.05	5.0	1	190	0	0.005	38.25	6	20,514

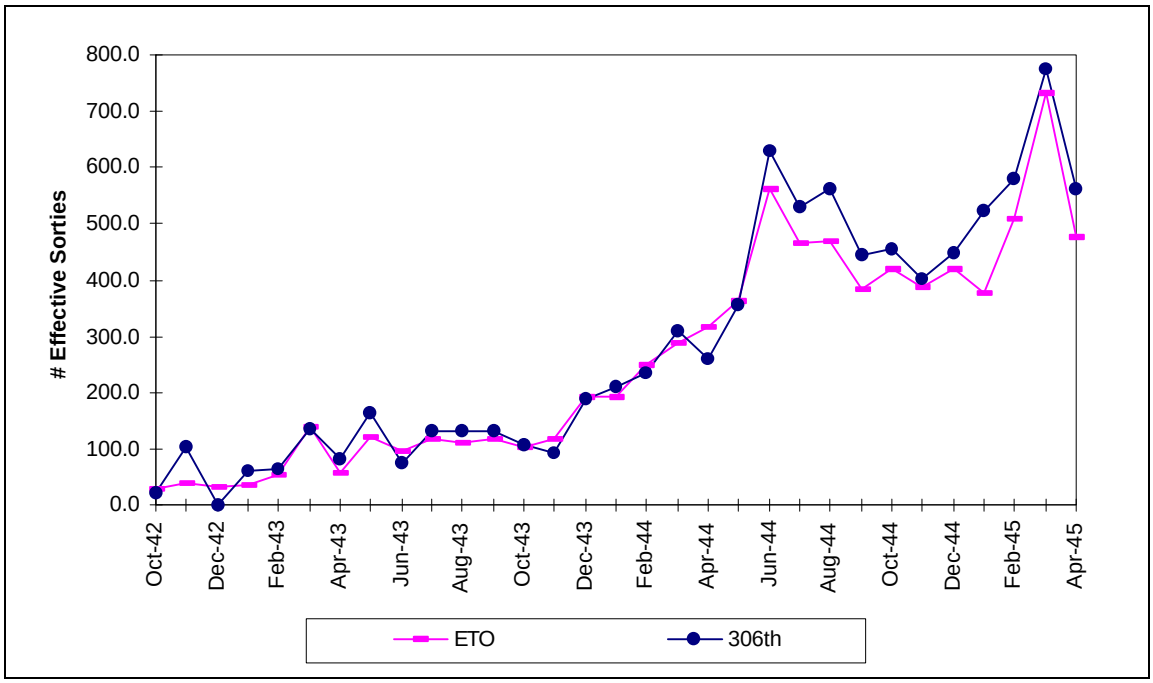

Figure 18. Normalized Comparison of Effective Sorties

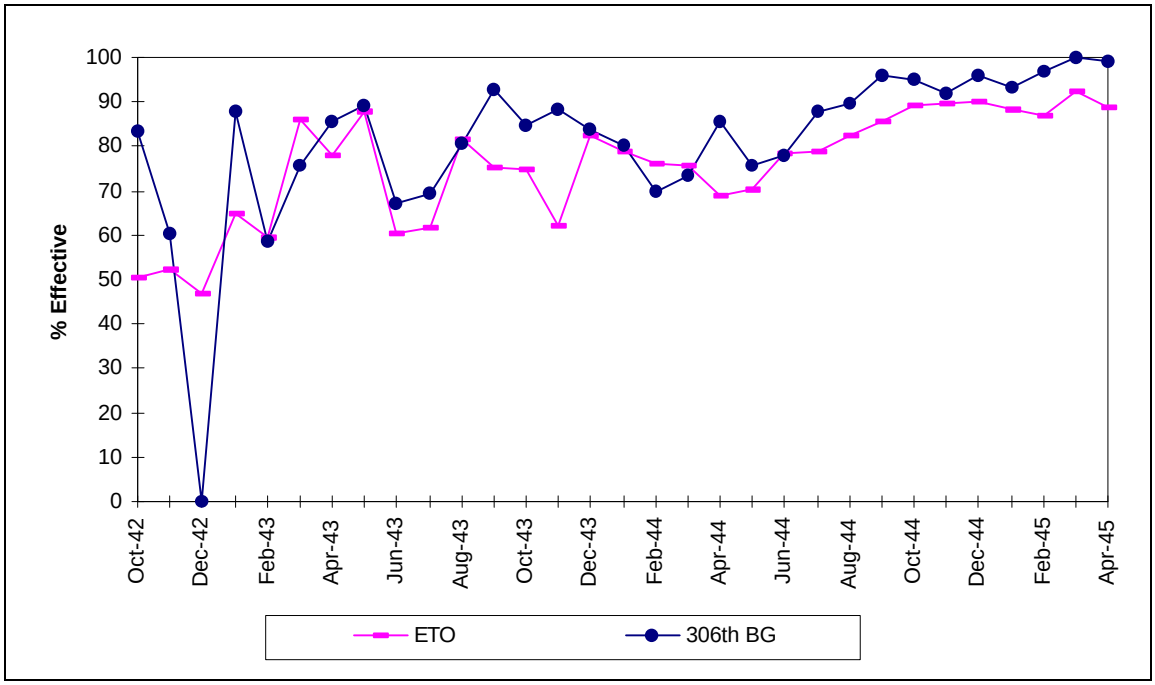

Figure 19. Comparison of % Losses per Effective Sortie

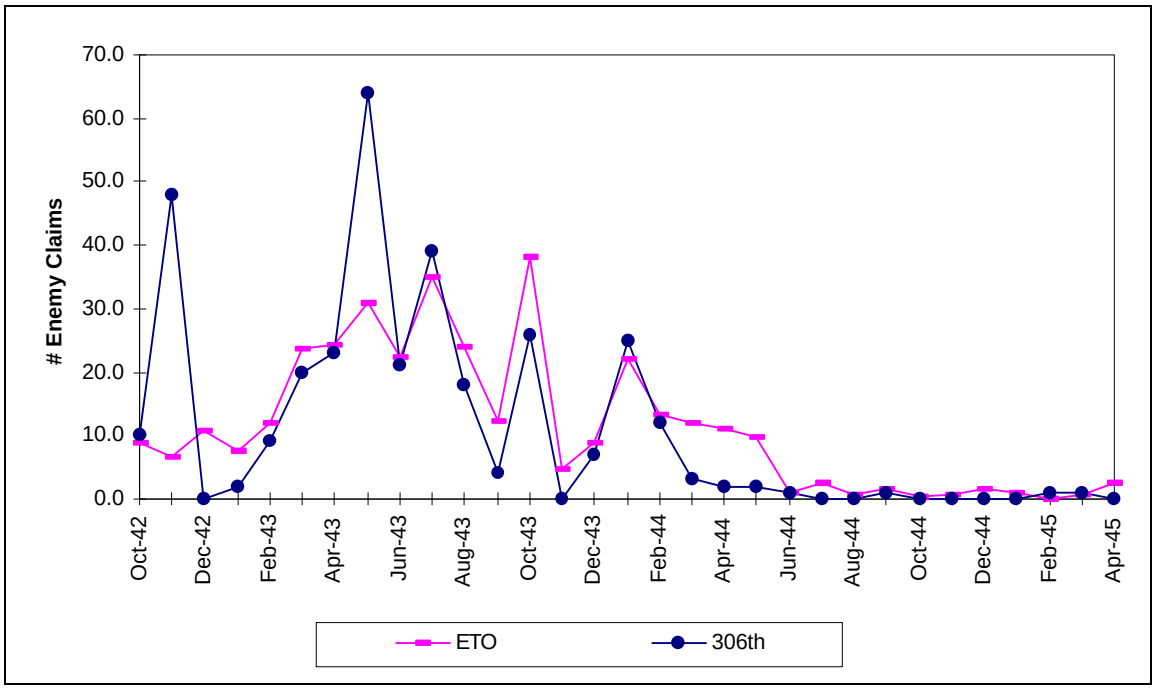

Figure 20. Normalized Comparison of Enemy Claims

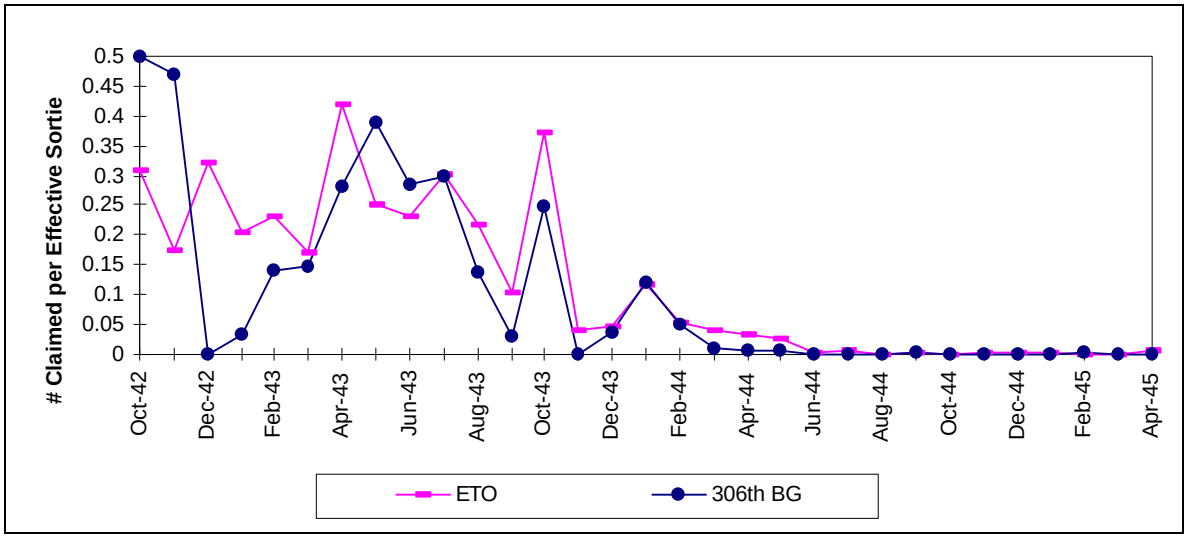

Figure 21. Comparison of Enemy Claims per Effective Sortie

Appendix D

Tables for the Eighth Air Force

The following tables provide miscellaneous information and statistics on the Eighth Air Force.

Table 6. Bombs Dropped by Eighth Air Force on Specified Targets

TARGET	TOTAL	1942 (Jun-Dec)	Annual %	1943	Annual %	1944	Annual %	1945 (Jan-May)	Annual %
Marshalling Yards	195,610	154	8.99	5,348	11.27	89,884	20.15	100,224	45.68
Airdromes & Airfields	82,691	543	31.70	5,513	11.62	57,810	12.96	18,825	8.58
Oil Installations	68,110	0	0	238	0.50	52,622	11.79	15,250	6.95
Military Installations	62,908	0	0	1,745	3.68	45,879	10.28	15,284	6.97
Other Specific Industries	53,492	78	4.55	7,030	14.81	32,658	7.32	13,726	6.26
City Areas	46,820	0	0	0	0	42,603	9.55	4,217	1.92
Aircraft Factories	44,437	149	8.70	5,090	10.73	36,726	8.23	2,472	1.13
Ground Cooperation	36,958	0	0	0	0	25,647	5.75	11,311	5.16
Ship Yards & Sub Pens	34,427	736	42.97	18,072	38.08	6,973	1.56	8,646	3.94
Railroads, Roads & Bridges	30,557	0	0	0	0	17,328	3.88	13,229	6.03
Other Communications	25,453	0	0	0	0	21,937	4.92	3,516	1.60
Jettisoned & Unidentified	25,335	53	3.09	1,083	2.28	16,098	3.61	8,101	3.69
Misc	7,921	0	0	3,333	7.02	0	0	4,588	2.09
TOTALS:	714,719	1,713		47,452		446,165		219,389	

Source: Army Air Forces Statistical Digest: World War II, p. 242.

The following displays the same data as "Annual Priorities."

Table 7. 1942 Bombing Percentages

1942 RANK ORDER	Tons	%
Ship Yards & Sub Pens	736	42.97
Airdromes & Airfields	543	31.70
Marshalling Yards	154	8.99
Aircraft Factories	149	8.70
Other Specific Industries	78	4.55
Jettisoned & Unidentified	53	3.09

Table 8. 1943 Bombing Percentages

1943 RANK ORDER	Tons	%
Ship Yards & Sub Pens	18,072	38.08
Other Specific Industries	7,030	14.81
Airdromes & Airfields	5,513	11.62
Marshalling Yards	5,348	11.27
Aircraft Factories	5,090	10.73
Misc	3,333	7.02
Military Installations	1,745	3.68
Jettisoned & Unidentified	1,083	2.28
Oil Installations	238	0.50

Table 9. 1944 Bombing Percentages

1944 RANK ORDER	Tons	%
Marshalling Yards	89,884	20.15
Airdromes & Airfields	57,810	12.96
Oil Installations	52,622	11.79
Military Installations	45,879	10.28
City Areas	42,603	9.55
Aircraft Factories	36,726	8.23
Other Specific Industries	32,658	7.32
Ground Cooperation	25,647	5.75
Other Communications	21,937	4.92
Railroads, Roads & Bridges	17,328	3.88
Jettisoned & Unidentified	16,098	3.61
Ship Yards & Sub Pens	6,973	1.56

Table 10. 1945 Bombing Percentages

1945 RANK ORDER	Tons	%
Marshalling Yards	100,224	45.68
Airdromes & Airfields	18,825	8.58
Military Installations	15,284	6.97
Oil Installations	15,250	6.95
Other Specific Industries	13,726	6.26
Railroads, Roads & Bridges	13,229	6.03
Ground Cooperation	11,311	5.16
Ship Yards & Sub Pens	8,646	3.94
Jettisoned & Unidentified	8,101	3.69
Misc	4,588	2.09
City Areas	4,217	1.92
Other Communications	3,516	1.60
Aircraft Factories	2,472	1.13

The following table provides a list of the top three targets bombed, based on the tonnage of bombs dropped. The source for this data is the USSBS, Air Force Rate of Operations (European Report # 61), p49. The figures in this table differ slightly from those provided by the *Army Air Forces Statistical Digest*.

Table 11. Top Three Targets Based on Tonnage of Bombs Dropped

MONTH	1st Target	Tons	2nd Target	Tons	3rd Target	Tons
Jun-43	Naval	1,101	Oil, Chemical & Rubber	454	Aircraft Factories	281
Jul-43	Aircraft Factories	1,211	Naval	754	Airfields	704
Aug-43	Airfields	2,259	Other Manufacturing	464	Tactical	291
Sep-43	Airfields	3,766	Naval	1,411	Marshalling Yards	925
Oct-43	Naval	1,453	Aircraft Factories	895	Airfields	838
Nov-43	Industrial Areas	3,419	Naval	1,121	Airfields	988
Dec-43	Industrial Areas	4,769	Airfields	1,738	Naval	1,108
Jan-44	Industrial Areas	4,389	V-Weapon Launch Sites	2,202	Aircraft Factories	1,766
Feb-44	Airfields	3,241	Aircraft Factories	3,174	Industrial Areas	2,988
Mar-44	Industrial Areas	6,198	Airfields	4,434	V-Weapon Launching Sites	2,152
Apr-44	Airfields	6,466	Industrial Areas	5,609	V-Weapon Launching Sites	3,077
May-44	Marshalling Yards	8,773	Industrial Areas	7,059	Airfields	6,436
Jun-44	Airfields	16,010	V-Weapon Launch Sites	8,897	Tactical	6,207
Jul-44	Industrial Areas	14,698	Oil, Chemical & Rubber	7,446	Marshalling Yards	4,041
Aug-44	Airfields	12,053	Oil, Chemical & Rubber	10,093	Other Transportation	5,423
Sep-44	Marshalling Yards	13,053	Tactical	5,513	Heavy Industry & Armament	5,229
Oct-44	Marshalling Yards	18,844	Oil, Chemical & Rubber	5,538	Heavy Industry & Armament	5,224
Nov-44	Oil, Chemical & Rubber	16,251	Marshalling Yards	11,859	Tactical	6,309
Dec-44	Marshalling Yards	22,921	Other Transportation	9,103	Oil, Chemical & Rubber	2,987
Jan-45	Marshalling Yards	21,298	Other Transportation	10,078	Oil, Chemical & Rubber	3,155
Feb-45	Marshalling Yards	35,141	Oil, Chemical & Rubber	5,864	Other Transportation	4,445
Mar-45	Marshalling Yards	28,563	Oil, Chemical & Rubber	9,228	Airfields	8,388
Apr-45	Marshalling Yards	16,359	Airfields	8,690	Industrial Areas	4,792

Notes:
- Industrial Areas = Cities, Towns, Public Utilities, Gov't buildings
- Aircraft Factories = Assembly, Components, Engines, Airframe, Propellers, & V-Weapons
- Heavy Industry = Armament/Ordnace Plants, Tanks Factories, Vehicles, Iron/Steel Industies, & Railraod works
- Other Manufacturing = Machinery, Abrasives, Bearing Plants, Electrical Products, Macine Tools, Optical Products, & Precision Instruments
- Oil, Chemical & Rubber = Explosive Plants, Chemical Plants, Natural/Synthetic Rubber/Tire Plants, Oil refineries, Natural Oil Refineries, Oil Storage
- Marshalling Yards = Rail Installations, Tracks, Marshalling Yards, & Stations
- Other Transportation = Bridges, Tunnels, Moving Trains/Rolling Stock, Highways/Vehicles, & Waterways/Boats
- Naval = Installations, Ports, Harbors, Sub Pens, Ships, Sub Yards, Tugs/Barges, Ship Building
- Airfields = Airfields & Airdromes
- Tactical = Troop Concentrations, Gun Emplacements, Supply Dumps/Warehouses, Radio/Radar Sites, & Direct Cooperation with Ground Troops
- V-Weapons Launching Sites
- Unidentified Targets

Appendix E

306th Stations and Movements

The following provides a summary of the locations that the 306th Bomb Group has been stationed. This information has been compiled from several sources: *The Mighty Eighth: Units, Men and Machines*, by Roger A. Freeman, p. 248; *Air Force Combat Units of World War II*, by Maurer Maurer, p. 179-80; and conversations with Mr. B. Rigg, Director of the Eighth Air Force Museum at Barksdale AFB, Louisiana.

1. 30 January 1942: Unit Activated
2. 1 March 1942 - 6 April 1942: Gowen Field, Utah
3. 6 April 1942 - 1 August 1942: Wendover Field, Utah
4. 1 August 1942 - September 1942: Unit en route to England
5. September 1942 - December 1945: Thurleigh, England
6. December 1945 - February 1946: Giebelstadt, Germany (Casey Jones Project*)
7. February 1946 - 16 August 1946: Istres, France (Casey Jones Project*)
8. 16 August 1946 - 13 September 1946: Furstenfeldbruck, Germany (Casey Jones Project*)
9. 13 September 1946 - 25 December 1946: Lechfeld, Germany (Casey Jones Project*)
10. 25 December 1946 - 1 July 1947: Inactivated

11. 1 July 1947 - August 1948: Andrews Field, Maryland

12. August 1948 - 16 June 1952: MacDill AFB, Florida (SAC's First B-47 Wing)

13. June 1952 - 1 July 1974: McCoy AFB, Florida (B-52s; flew during Vietnam)

14. 1 July 1974: Inactivated

* Note: The Casey Jones Project was a post-war classified operation to photo map the European Theater. The 306th and 305th Bomb Groups were assigned to carry out the operation.

Glossary

ACSC	Air Command and Staff College
A/D	Airdrome
AU	Air University
ACTS	Air Corps Tactics School
AFHRA	Air Force Historical Research Agency
ARGUMENT	Codename for CBO operation to increase attrition of *Luftwaffe*
BC	Bomber Command
BD	Bomb Division
BG	Bomb Group
Big-B	Nickname for Berlin
Buckeye Red	Weather scout aircraft
BW	Bomb Wing
Casey Jones Project	Post-war operation to photo-map the ETO
CBO	Combined Bomber Offensive
CBW	Combat Bomb Wing
Chaff	Thin strips of aluminum foil used to confuse enemy radar
D-Day	Allied invasion at Normandy
ETO	European Theater of Operations
FC	Fighter Command
FG	Fighter Group
Flak	Anti-aircraft artillery (from the German term for "air defense cannon": ***fl****iegera****b****werh****k****anonen*)
FW	Fighter Wing
FW	Focke Wulf (German aircraft manufacturer)
Gee	Radar bombing technique (see notes for Chapter 3)
Gee-H	Radar bombing technique (see notes for Chapter 3)
H2X	Radar bombing technique using X band radar (see notes for Chapter 3)

H2S	Radar bombing technique using S band radar (see notes for Chapter 3)
Luftwaffe	German Air Force
Me	Messerschmitt (German Aircraft Manufacturer)
Mickey	Nickname for H2X radar
Micro-H	Radar bombing technique (see notes for Chapter 3)
MPI	Main Point of Bomb Impact
Mosquito	British twin-engine fighter
M/Y	Marshalling Yard
Nickel	Slang for Leaflets dropped by air
Oboe	Radar bombing technique
OVERLORD	Plan for the allied invasion of France
PFF	Pathfinder Force
POINTBLANK	Codename for the Combined Bomber Offensive
PSYOP	Psychological Operation
Razzle Dazzle	Radar evasion technique
Spitfire	British fighter aircraft
Stalag Luft	German POW Camp for Officer Flight Crew
USAAF	United States Army Air Forces
USAF	United States Air Force
USSAFE	United States Strategic Air Forces in Europe
USSBS	United States Strategic Bombing Survey
Window	British term for Chaff

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