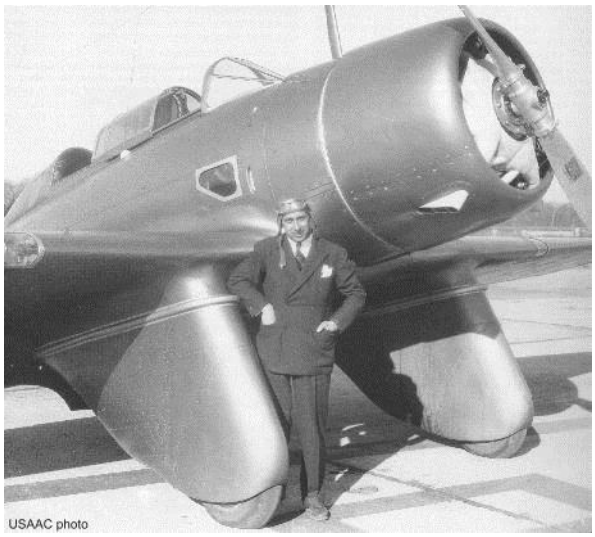
P-47 Thunderbolt: Aviation Darwinism
Chapter One:

The Republic P-47 Thunderbolt had the distinction of being the heaviest single engine fighter to see service in World War Two. Parked alongside any of its wartime contemporaries, the Thunderbolt dwarfs them with its remarkable bulk. Despite its size, the P-47 proved to be one of the best performing fighters to see combat. Produced in greater numbers than any other U.S. made fighter, the story of how it came to exist is at least as interesting as its many accomplishments.

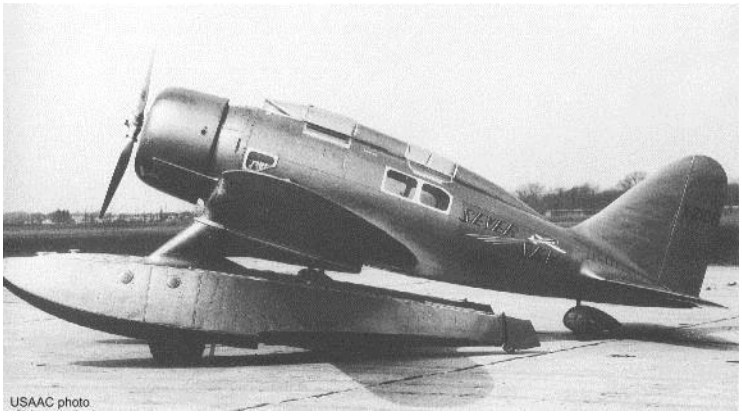
The development of the Thunderbolt was a classic instance of design evolution tracing its origin back to Alexander P. de Seversky and his highly innovative aircraft of the early 1930's. Seversky, a Russian national, was a veteran of World War One. Seversky flew with the Czarist Naval Air Service and suffered the loss of a leg as a result of being shot down in 1915. Unfazed, he managed to convince his commanders to allow him to fly again using an artificial leg. Ultimately, Seversky was credited with no less than shooting down thirteen German aircraft before the Czarist government reached an armistice with the Kaiser Wilhelm in 1917. In early 1918 Seversky was appointed by the Czarist Government to study aircraft design and manufacturing in the United States. While he was in the U.S., the Communist revolution made it exceptionally dangerous to return home. Seversky had heard of the mass executions of his fellow officers and promptly applied for American citizenship.

Even in his early years in America, Seversky was obviously skilled at promoting himself, because he managed to gain a position as a test pilot and consultant with the fledgling United States Army Air Service. Seversky's brilliance was quickly recognized and he was assigned as an assistant to General Billy Mitchell. Over the span of the next 8 years, Seversky applied for no less than 360 U.S. patents. This included a gyro-stabilized bombsight purchased by the Army Air Corps. He even managed to obtain a commission in the Army Air Corps Reserve. Major Seversky formed a company registered as Seversky Aero Corporation. Unfortunately, the small company did not survive the stock market crash of 1929. Undaunted by this serious financial setback, Seversky attracted enough investors to form a new firm. In February of 1931, he was elected president of the new Seversky Aircraft Corporation. The Major quickly surrounded himself with several expatriate Russian engineers including Michael Gregor and the man who would ultimately head the P-47 design team, Alexander Kartveli.



Major Alexander de Seversky standing before his beautiful SEV-3XAR in the fall of 1934.

The Russian connection quickly produced fruit. The first design was manufactured under contract by Edo Aircraft Corporation of College Point, Long Island, NY. Designed as a low wing monoplane design, this first aircraft, designated the SEV-3, was a floatplane. Edo, being the leading manufacturer of aircraft floats, was an ideal choice when one considers that Seversky had no manufacturing facilities. Even with Edo's expertise, construction still took two years, largely due to the lack of capital funds. Finally, in June of 1933, the SEV-3 took off from Long Island waters with Seversky at its controls. Painted in a stunning bronze, the SEV-3 was one of the more advanced aircraft in the world. Several months later and fitted with a more powerful engine, the SEV-3 set a new world speed record for amphibians. One major contributor to the plane's excellent speed was its distinctive thin, but broad semi-elliptical wing. This basic wing design would still be seen on the P-47 a decade later.



The record breaking SEV-3 amphibian as it appeared at Wright Field in the summer of 1934.

Seversky turned out several variations on the SEV-3 theme over the next several months and tried to sell the design to the Air Corps. The company finally gained a contract to manufacture a new Air Corps trainer designated the BT-8. It was very easy to spot the resemblance to the original SEV-3.

Major Alexander de Seversky at the controls of the prototype BT-8 (developed from the SEV-3XAR).

Eventually a further development of the SEV-3 would be submitted for an Air Corps fighter design competition. It was the only two seat aircraft in the competition and this combined with serious engine difficulties would result in a poor showing. Typical of Seversky's resilience, the Major returned to Farmingdale to design an aircraft that could win the next competition the following year.

Seversky's Farmingdale, Long Island facility as it appeared circa 1938.
Note the P-35 in the lower left of this Steve Hudek photograph.

The new fighter incorporated a redesigned fuselage and tail section. Designated the SEV-1XP, it was flown to Wright Field in Ohio for the 1936 fighter competition, from which, it emerged as the winner. Further development resulted in an Air Corps order for the fighter, now given the new designation P-35. The one glaring fault of the P-35 was its retractable landing gear layout. In an era where flush folding landing gear were becoming common-place on new fighter designs, the P-35 used a method that was minimally effective in reducing drag, as compared to a fixed landing arrangement. The Seversky's gear simply folded back into a pod-like housing that protruded from the underside of the wing. When seen alongside many of the worlds newer fighter designs, such as the Hawker Hurricane, Supermarine Spitfire, Curtiss Hawk 75 and Germany's Messerschmitt 109, the P-35 appeared

awkward and decidedly less sleek. Nonetheless, the new P-35 offered performance on par with most of the world's best fighters.

Major Alexander de Seversky at the controls of the SEV-1XP over Manhattan in 1936.

As the later half of the 1930's crept by, the obvious increase in tensions in Europe and Japan's war with China created a greater demand worldwide for combat aircraft. Seversky, feeling the severe pinch of the depression combined with American isolationism was quickly being overwhelmed by red ink. The Major began marketing his aircraft and design experience to several nations. Soon, orders began arriving from Japan, the Soviet Union, Columbia and Sweden. These production runs kept the factory running and provided enough cash to make payrolls. Nonetheless, it was becoming obvious that Seversky would not be able to continue selling aircraft that were rapidly becoming obsolescent. All the export aircraft were based upon SEV-3 and SEV-1XP technology. If a new opportunity did not come along soon, Seversky would be forced to closed their doors.

Alexander de Seversky at the controls of the first production P-35, April 30, 1937.

That new opportunity arrived in 1939. That year, the Army Air Corps held yet another Pursuit Competition. Two aircraft were entered by Seversky. The Major entered his AP-4 design and Alexander Kartveli submitted the XP-41. In most respects, these two fighters were very similar. The

largest, and ultimately, the deciding difference was the Major's use of turbo-supercharger as opposed to a single stage engine driven mechanical supercharger on Kartveli's XP-41. The turbo-charger installation was unusual in that it was mounted in the fuselage behind the cockpit. This required extensive ducting to carry exhaust gases to the rear of the fighter and, return the compressed air to the engine's induction system. This complexity was offset by the outstanding high altitude performance of the aircraft. The XP-41, even with its flush folding landing gear offered only mediocre performance at low altitude and demonstrated a rapidly degrading level of performance above 15,000 feet.

Seversky's installation of a turbo-supercharger in the aft fuselage of the AP-4 led to excellent high altitude
performance. It resulted in the P-43 Lancer of 1940 and foreshadowed the P-47 Thunderbolt of 1941.

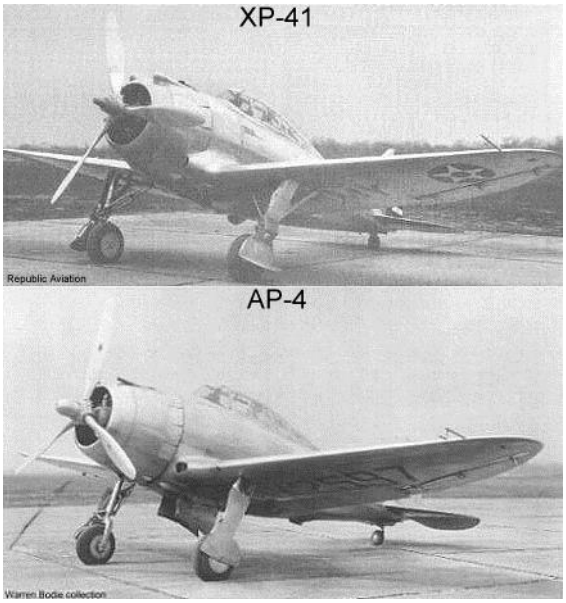
The AP-4 was clearly the better of the two and certainly the best performing fighter in the competition. No matter, Curtiss won the competition with its XP-40 largely based upon its ability to begin full production immediately. Fortunately, the AP-4 was not ignored. A contract for 13 Service Test examples was issued. However, these would not be manufactured under the watchful eye of Major Seversky. He would be deposed as the head of the company that he had created and molded. The AP-4 would be refined and manufactured by a hastily reorganized company and the new fighter would be known as the Republic YP-43.

In April of 1939, after losing more than $550,000 dollars the year before, the board members of Seversky Aircraft voted Wallace Kellet in as President of the corporation and Major Seversky lost control of his beloved company. By September, the company had been reorganized and renamed Republic Aviation Corporation. Seversky did not go without a fight. By the time Seversky was finally satisfied with the settlement, it was well into September of 1942.

Meanwhile, the Air Corps made an effort to keep the new company afloat by awarding Republic a contract for 13 aircraft based upon the Seversky's AP-4. Designated the YP-43, these along with P-35, EP-106 (an export version of the P-35 for Sweden) and 2PA-204A Guardsman kept the production lines open and allowed Republic to retain the core of its skilled workforce.

The YP-43 contract was truly based upon more than keeping Republic operating. The decision was also predicated upon the outstanding performance of the AP-4. Much to the delight of the USAAC, the AP-4 proved to even faster than the Spitfire Mk.I above 22,000 feet. Although the major contract had been awarded to Curtiss for the low altitude P-40, the Air Corps was well aware that much of the

aerial combat now underway in Europe was being conducted at higher altitudes than that which the P-40 was capable of operating at with any reasonable level of performance.

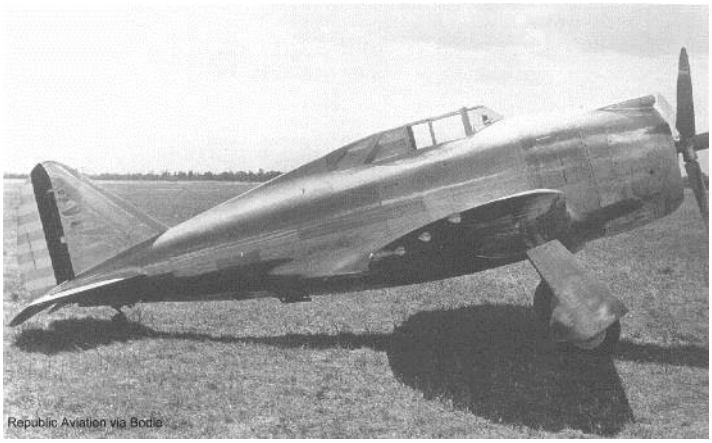


In this composite photo of the XP-41 and AP-4, the differences between the two are evident. The AP-4 has a superior landing gear design. You can also see the turbo-supercharger beneath the rear fuselage of the AP-4. The XP-41 uses a different air intake than that in the AP-4's wing root. The XP-41 uses a Curtiss Electric propeller, the AP-4 employs a Hamilton-Standard.

The AP-4 was not the only U.S. fighter to employ a turbo-supercharger for high altitude performance. Curtiss was flying the XP-37 and the YP-37, Bell had built the XP-39 Airacobra and Lockheed had presented the high performance XP-38. Each if these aircraft used the Allison V-1710 V-12 engine and each was suffering teething troubles. Ultimately, the Curtiss fighter was relegated to the scrap heap. The Air Corps stripped the XP-39 of its turbo-supercharger, reducing the Airacobra to being one of the most ineffective fighters of its day. The XP-38, after years of development, would eventually go on to be one of the finest fighters of the war. However, it would not be combat ready until well into 1942.

A rare and beautiful photo of the new USAAC fighters of 1940.
In accending order, a YP-43, an early P-40, a P-39C and a YP-38.
Special thanks is in order to author Warren Bodie for his
generous permission to use his personal photos in this story.

Once a contract for the 13 YP-43 fighters had been issued, Kartveli his team began refining the AP-4, reducing the amount of glass behind the cockpit and moving the air inlet from the leading edge of the wing root to a location below the engine. This resulted in the classic oval cowling that continued with the P-47. The redesigned cockpit glass would also be carried over to the Thunderbolt.



One of the YP-43 aircraft with the original tail wheel installation.

The contract called for certain performance guarantees. Maximum speed was required to equal or exceed 351 mph. The YP-43 bettered that by 5 mph. The fighter was required to climb to 15,000 feet

in 6 minutes or less. The YP-43 was able to exceed this by nearly 400 ft/min. The first YP-43 took to the air for the first time in March of 1940. While it lacked armor and self-sealing fuel tanks, it provided the USAAC with its first fighter that could offer performance on par with the fighters now doing battle over Europe. However, with only 13 currently on contract, the fighter's performance mattered little when the warring powers were putting up hundreds of high performance fighters with many more under construction. The realization that the United States was woefully prepared for a modern air war was not lost on the USAAC. The flurries of design activity were about to break out into a full snowstorm as America began to come out of her isolationist muddle.

Soon after receiving the first of the YP-43's, the Air Corps discovered that although the new fighter was considerably longer than the P-35, it was no less prone to ground looping. Eventually, Republic redesigned the tail wheel assembly. The new design raised the tail of the aircraft nearly a foot higher. This reduced the tendency to ground loop and improved vision over the nose. The new tail wheel was no longer fully retractable. Eventually, 272 P-43 Lancers would be manufactured. Of these, 108 would be sent to the Chinese to fight Japan. But, not before many passed through the hands of the Flying Tigers (AVG).

A P-43A in USAAF Training Command service, circa 1942. Note the revised tail wheel assembly.

Claire Chennault utilized some of his AVG pilots to ferry the newly arriving P-43's to the new owners. In general, the Flying Tigers were much impressed with the P-43. They liked its excellent speed at high altitude. This was something that their Curtiss Tomahawks lacked, having only a single stage supercharger. The little barrel bellied P-43 made good power right up through 30,000 ft. The Tomahawk, on the other hand, was running out of breath by 20,000 ft. The pilots liked the Lancer's good handling and rapid rate of roll (although the Tomahawk was a fast roller as well). They were also pleased to see that the Republic fighter carried the same armament as their trusty Tomahawks, twin .50 caliber machine guns above the engine and two .30 caliber Brownings in each wing. The fact that the air cooled radial engine did not have a Prestone cooling system did not go unappreciated. The Curtiss could be brought down by a single rifle caliber bullet striking any portion of the Allison engine's cooling system. This was not the case with the P-43. In short, there wasn't anything not to like about the P-43.

Some of the AVG pilots went to Chennault and asked if they could retain some of the Lancers for their use, alongside the Tomahawk. They pointed out that the Lancer could out-climb the Curtiss and get far above Japanese formations, something they could seldom achieve with their P-40's. However, Chennault turned down their request, and believed that he had good reasons to do so. Perhaps the primary reason was that the first P-43's delivered lacked armor and self sealing fuel tanks. The risk of his pilots being incinerated was certainly a real concern for Chennault. A few months later the AVG

ferried additional Lancers in. These were P-43A's equipped with both armor and self sealing fuel tanks. However, the self sealing tanks steadfastly refused to seal. They leaked so badly that Chennault displayed no interest in these either. The AVG would soldier on with their Tomahawks and a few P-40E's until they disbanded on July 4th, 1942.

Let us digress to earlier events at Farmingdale. In September of 1939 things were really beginning to jump at Republic. The Air Corps issued a circular proposal in that year calling for a lightweight interceptor. Curtiss jumped in with a lightened variation of the P-40 airframe designated the XP-46. Republic submitted a very similar design which the Air Corps designated the XP-47. Both aircraft offered the same basic concept: Build the smallest possible airframe around an Allison V-1710 V-12 engine. This was also the first design from either Seversky or Republic that was to be powered by a liquid cooled engine. The major difference between the Curtiss and Republic effort boiled down to Kartveli electing to use a turbo-supercharger. As it was, Kartveli's design never moved beyond the mock-up stage and the XP-46 showed no performance improvement over the P-40.

While the XP-47 program was underway, Republic engineers were looking to improve the performance of the P-43. The result was a contract to develop the lightweight XP-44. Based upon the P-43 airframe, Republic planned to install the Pratt & Whitney R-2180 engine in a reworked Lancer. However, this powerplant did not produce the expected horsepower and the design team upgraded to the Wright R-2600. This engine made a reliable 1,600 hp. Yet, it proved to be unsuitable for turbo-supercharging. Finally, good fortune smiled on the XP-44 in the form of the P&W R-2800 Double Wasp. With a contract for 80 examples in hand, Republic set out to modify a P-43 airframe to take the new powerhouse 18 cylinder engine.

To understand how important the R-2800 engine was to become, it is essential to know that many of America's best fighters and bombers of WWII were powered by this redoubtable engine. These include, but is not limited to, the P-47 Thunderbolt, the F4U Corsair, the F6F Hellcat and the B-26 and A-26 bombers. The R-2800 that was to be fitted to the XP-44 produced 1,850 hp. Later variants used in the P-47M and P-47N produced as much as 2,800 and considerably more (up to 3,600 hp) on dynamometers.

Slowly, but steadily, work progressed on the XP-44 mock-up, now known by some at Farmingdale as the "Rocket" (an earlier design concept by Republic, the AP-10, was also called the Rocket) Performance projections were impressive. A maximum speed of 402 mph was expected at 20,000 feet. Climb rate should approach, or even exceed 4,000 ft/min. Armament was to consist of four.50 caliber Browning machine guns, two mounted above the engine and one installed in each wing. Fuel capacity was no greater than the P-43. With the increased thirst of the far larger R-2800 engine, range would be limited. There is little doubt, however, that the P-44 would have been an effective interceptor.

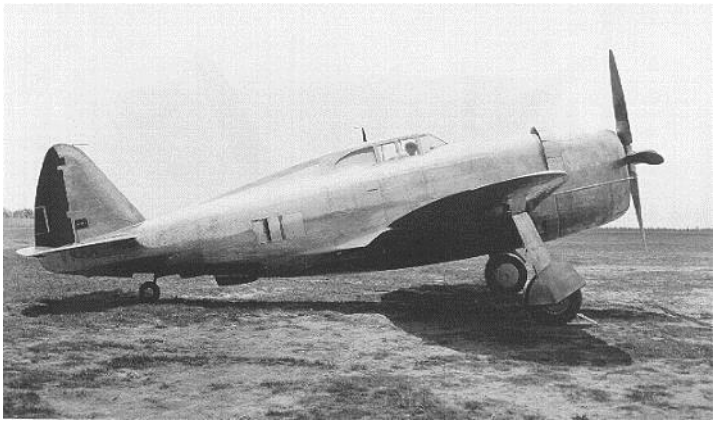
Bob Boyd's terrific illustration of the proposed P-44 is based upon photos of the XP-44 mock-up.

Unfortunately, the Air Corps did not need a short range interceptor. Indeed, as data from the European war was analyzed, it was becoming very clear that a fighter of far greater capability was going to be needed. The need to fly even faster, at greater altitudes, over longer distances was now evident. The Experimental Aircraft Division of the USAAC called in Kartveli and informed him that the XP-44 contract was cancelled. So was the XP-47 lightweight fighter contract. They had drawn up a new set of requirements and authorized a new contract to design and develop a new fighter that would be designated the XP-47B. The fighter had to meet these new requirements, some of which were:

1) The aircraft must attain at least 400 mph at 25,000 feet.
2) It must be equipped with at least six .50 caliber machine guns, with eight being preferred.
3) Armor plate must be fitted to protect the pilot.
4) Self sealing fuel tanks must be fitted.
5) Fuel capacity was to be a minimum of 315 gallons.

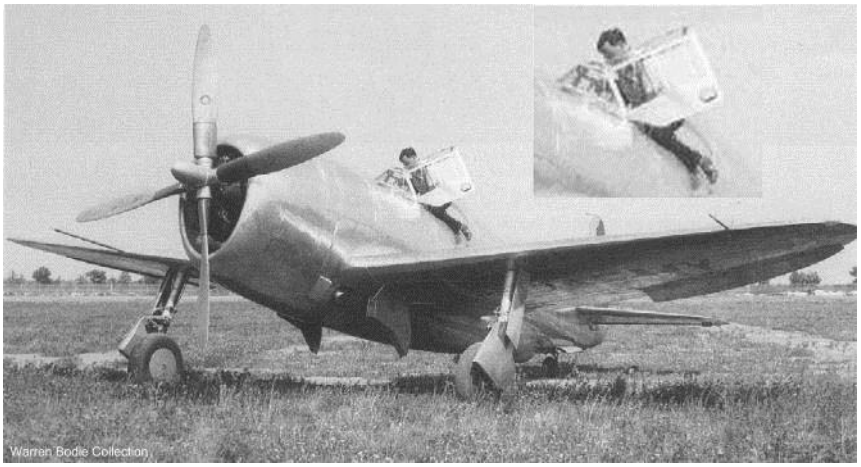
Kartveli realized that the P-43/XP-44 airframe was not capable of being adapted to these new requirements. Therefore, he began sketching a new design on the train returning to New York. He kept the basic cockpit design, stretched the fuselage, reshaped the tail surfaces and increased the wing span. When Kartveli arrived at Pennsylvania Station in Manhattan, he had the basic outline of the fighter would ultimately break the back of the Luftwaffe in 1944.

When one studies the design philosophy of the P-47, one cannot help but realize that Major Seversky's vision of a true high performance fighter had been fulfilled. Since 1939 Seversky had stated that any new fighter designs would need to be bigger, faster and higher flying. The USAAF, already unhappy with Seversky for late deliveries and using Air Corps money to fund racing versions of the P-35, not only ignored the Major, they spared no effort to discredit him. Yet, within a few months, circumstances had evolved, largely as a result of war in Europe. As a result, the lightweight fighter concept, liked very much by Kartveli, was a philosophy now bankrupt. Finally out from Seversky's shadow, Kartveli had thrown himself and his engineering staff into the XP-47 and XP-47A designs. It must have been a terrible shock to find out that all their work was as good as for nothing. A more sobering realization for Kartveli was that the Major had been correct all along.



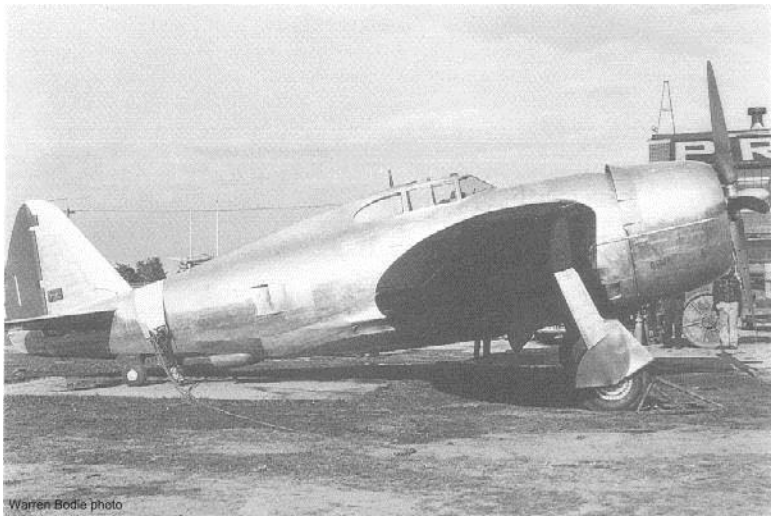
The XP-47B on roll out day, May 4th, 1941.

Unlike the XP-44 design, no mock-up of the XP-47B was requested by the USAAC, nor was any money allocated for one. The new fighter could not hope to go efficiently from the drafting table to the factory floor. Therefore, a mock-up was built at company expense. In early production P-47's the vast majority of the cockpit section was taken straight from the P-43. However, for some unknown reason, the mock-up, prototype and the first three production P-47B aircraft were built with an unusual and difficult to use fixed canopy equipped with a forward opening door not greatly unlike the P-39 and early Hawker Typhoon. Fortunately, whoever selected this oddball canopy design was eventually over-ruled and the P-43 arrangement was implemented after the fourth aircraft.



The unusual cockpit door of the XP-47B is clearly seen in the inset.
Note that the vent window is open.

Work on the first flyable XP-47B moved along at a brisk pace and the "eggheads" from Wright Field were invited to inspect the new fighter. Generally, they were happy with what they saw. One problem discovered was that measured fuel capacity was somewhat less than the specification had called for. Only 298 gallons could be squeezed into the tanks, 17 gallons less than the requirement. The weight of the plane was greater than the specification requirements as well. Republic's design team had built immense strength into the design. This pushed the weight up to just over 12,500 lbs, or about 900 lbs over the required limit. The engineers from Wright Field indicated that these issues could be overlooked if the fighter performed to specification.



Tied down and chocked, the prototype XP-47B is readied for a maximum power run-up the day before its first flight.

Finally, on May 6th, 1941, the big fighter was ready for its first flight. With test pilot Lowery Brabham at the controls, the XP-47B roared off Republic's wet sod field, getting airborne after a scant 2,500 feet of takeoff roll. Brabham was instantly pleased with the fighter's handling and power. Nonetheless, as he climbed and the ambient pressure dropped, smoke began to fill the cockpit. Unable to open the cockpit door in flight, Brabham opened a small vent window. That, however, was a mistake. The velocity of the air rushing past the vent served only to lower the relative pressure across the vent, resulting in even more smoke being drawn into the cockpit. Concerned, but not panicked, Brabham decided to get the ship down quickly. Thoughts of losing the prototype on its maiden flight were all the motivation he needed. Remembering how soft the wet sod had been at Farmingdale, Brabham headed for the paved runways of the nearby Air Corps facility at Mitchel Field.

The XP-47B was photographed in color several times during its early test flights.

The first landing of the XP-47B was uneventful. The flaps, brakes and landing gear worked as advertised and Brabham taxied in towards the Air Corps hangers. His arrival, however, was indeed an event. Army and Air Corp personnel poured out to greet the big fighter as it rolled to a stop with its huge propeller winding down. Nothing like the XP-47B had ever been seen before. Senior officers quickly cleared the field and the new fighter was quickly rolled into a hanger and the doors shut.

It took but a quick inspection to determine what had caused the smoke in the cockpit. Oil in the turbo-supercharger ducting was the culprit. Prior to taking off, Brabham had performed an extensive run-up on the concrete ramp. He checked, double checked and even triple checked every engine instrument. He performed several mag checks and made sure the engine was at optimal operating temperature. During this time, oil had been accumulating in the ducting leading to the turbo-supercharger installed behind the cockpit. The ducting ran just below the cockpit. The engine is fitted with a pair of wastegates that dump excess boost and thereby regulate manifold pressure. The wastegates are in turn, controlled by a governor. At low altitudes the governor monitors and is itself controlled by maximum manifold pressure. At altitude, the governor responds to turbine speed. As the XP-47B climbed out, the governor closed the wastegates. The oil in the ducts was rapidly heated and began to give off smoke.

Mitchel Field as it appeared in 1931. The photo has been colorized.

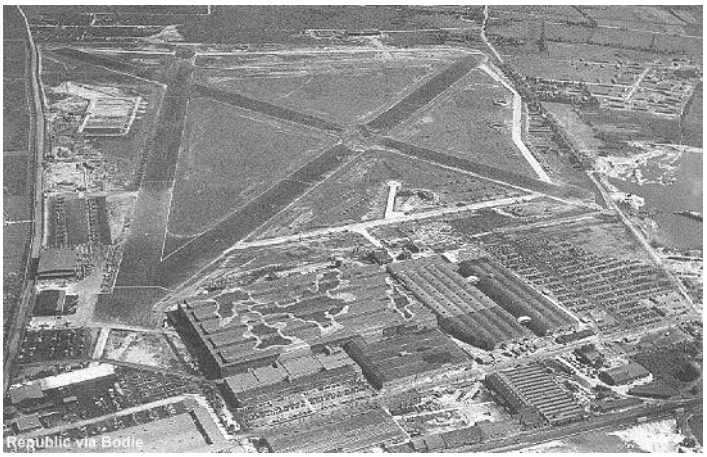
The XP-47B would remain at Mitchel Field for about a month as modifications were made to eliminate the possibility of oil smoke entering into the cockpit. Some additional, but minor changes were implemented and surprisingly, no national insignia was yet applied to the wings and fuselage. The XP-47B was never delivered to Wright Field, as had been the practice for all new designs for many years. It was tested in the skies over Long Island. Having been assigned to Republic in order to expedite any required changes, it would remain in hands of its manufacturer until its inadvertent loss in 1942.

The first P-47B off of the line was flown to Wright Field for testing. The first production aircraft was actually the fifth airframe completed, and the first with a sliding canopy.

In the meantime, The XP-47B revealed that it was everything that it was hoped it would be. It attained a corrected true airspeed of 412 mph at 25,800 ft. The big Pratt & Whitney R-2800-17 proved to be reliable and actually produced the horsepower that Pratt & Whitney had claimed it would. The Curtiss Electric propeller worked well at getting all 1,960 hp harnessed for thrust. There were some problems still to be worked out. The turbo-supercharger installation increased the risk of a fire (this is exactly what caused the loss of the prototype nearly a year later). The cockpit canopy needed to be rethought. Indeed, there would be a myriad of minor changes that were to be incorporated into the first production aircraft. But, the die was cast. Alexander de Seversky had been vindicated. His theories had passed the test of reality and the fate of many a German and Japanese airman had been sealed.

While the first P-47B aircraft were being extensively tested, Republic was hard at work at getting production underway in the new plant building just completed at Farmingdale. In addition to this, the first of three new paved runways were completed. Ultimately, expansion of this Long Island facility would quadruple the size of the factory floor space. Nonetheless, all of this new construction would not be enough to meet the future contract demands for the Thunderbolt. In November of 1942 the War Production Board authorized a new plant to be constructed adjacent to the Evansville, Indiana airport. This would provide the critical production volume that would enable the P-47 to the most produced American fighter of World War Two. Production would ramp up slowly, largely a result of the extensive testing involved. Despite getting off to a slow start, by the middle of 1943, Thunderbolts would be rolling off the factory floor at a rate never envisioned just two years before.

Shortly after the first YP-47B rolled out of the plant in November of 1941, the United States would find itself at war with both Japan and Germany. This only hastened further development of the P-47. An uprated and lighter version of the Pratt & Whitney R-2800 engine was installed in the early P-47B aircraft. This provided for even better speed at altitude and a small improvement in climb rate. If there was any area where the P-47B was less than sterling, it was its rather poor rate of climb. Yet, this was not as great a concern as some might think. Ultimately, the P-47 would be used in a role where climb ability was not especially critical to performing its mission.



Republic's Farmingdale facility as it appeared from the air in mid 1943.
The total area of manufacturing space had quadrupled since the beginning of 1941.

By early June 1942, the first batch of 37 P-47B's were issued to the 56th Fighter Group, with the 63rd Fighter Squadron being stationed at Republic's Farmingdale airfield. One problem faced almost immediately involved the difficulty of changing engines on the B model Thunderbolts. Maintenance crews were finding this operation to be very time consuming. Republic responded with their first major change to the P-47 airframe. An 8-inch extension of the fuselage, forward of firewall allowed for a new Quick Engine Change (QEC) design that cut the time required to hang a new engine by better than 60%. Not only did the lengthened fuselage aid normal maintenance; it improved the handling and maneuverability. This change was introduced shortly after the C model began production. Virtually every Thunderbolt previously manufactured was retrofitted with this change.

Lt. Earl Haywood of the 56th Fighter Group stands before his brand new P-47B.
Later, these early fighters were redesignated RP-47B's and were used only for training.

Meanwhile the 56th was gradually transitioning to the large and powerful fighter. Hub Zemke, promoted from Lieutenant to Major (skipping right past Captain), was named to command the 56th in September of 1942 (he had also commanded the 80th Fighter Group briefly, also at Farmingdale). Zemke was not a man to be trifled with, being a no-nonsense flyer with ideas on fighter tactics that were well ahead of his contemporaries. Shortly after assuming command, he was once again promoted, now to Lt. Colonel. The training process was one filled with hair-raising washouts and

several fatal wrecks. It was here that the P-47 established itself as a remarkably tough aircraft. More than a few pilots walked away from training crashes that would likely have been fatal had they been flying a less substantial fighter, such as a P-40 or P-39.

Hub Zemke with his P-47C, circa 1943.

Gradually, the Group learned how to manage the Thunderbolt. Still, there was a new problem beginning to appear. Powerful fighters such as the P-47 and P-38 were encountering something relatively new to aviation; compressibility. This new generation of high-speed aircraft were capable of incredible speeds in a dive. Compressibility is a term used to describe what happens when localized airflow across a wing approaches transonic velocity. The resulting shock wave could lock the elevators as if in a vise. Pilots were running up against compressibility and they were dying. P-47's and P-38's were being flown straight into the ground, or even breaking up in flight. The learning curve was far steeper than it had ever been before. Pilots now had to learn how to deal with this new, terrifying phenomena. Testing showed that the Thunderbolt could be flown out of a terminal velocity dive as it descended into warmer air at lower altitudes. This is because as the plane continues down, the relative speed of sound goes up. Eventually, the aircraft's Mach number will drop (although its actual airspeed does not) and the shock wave will dissipate, allowing the pilot to regain control again. Pilots were instructed to pull off the throttle, and avoid using too much up elevator trim. Too much trim, or too much back pressure on the stick could over-stress the airframe when the fighter began to respond to control inputs. Pilots who had flown the P-47 into compressibility came away with bruises to verify their adventure. The Thunderbolt's ailerons would flutter as it exceeded its critical Mach limits, causing the stick to move violently from side to side; pummeling the inside of the pilot's thighs black and blue.

The 56th Fighter Group was greeted by brand new P-47C fighters upon arrival in Britain. This Thunderbolt, a P-47C-2-RE, sits with its new white banded cowling and tail stripes. The 8th Air Force painted these white markings on all P-47's in an effort to aid in identification.

On Thanksgiving day of 1942, the 56th was notified to prepare for deployment to Britain. Zemke was ready. His squadrons were ready. In fact, Zemke was concerned that the Group was getting to the point of being over-trained. It was time to prove what the P-47 could do in combat. It was also time to see if his training methods and tactics would meet the challenge over German controlled air space. Lt. Col. Zemke had a few pilots that he was worried about. A few fellows were too aggressive. Some others had failed gunnery school. Of these, Zemke doubted that one young man would survive very long in combat. Robert Johnson nearly proved Zemke correct on his early missions. However, Johnson would survive his first brushes with the Luftwaffe and go on to terrorize the Luftwaffe like no one else in the 8th Air Force.

On January 3rd, 1943, the 56th boarded the HMS Queen Elizabeth for the trip across the Atlantic. Zemke believed that the Groups weary P-47B fighters were being sent along as well. They would not be making the trip. A new Fighter Group would be taking charge of the old B models. When the 56th arrived in Britain, they discovered shiny new Thunderbolts waiting for them. These were the latest P-47C's. Faster and better handling than the old B's, the new fighters were the best reception committee that Zemke could have asked for. Unfortunately, things rapidly changed as the 56th were informed that their new fighters must be surrendered to the 4th Fighter Group (formerly the Eagle Squadron). The 56th would have to wait to get their Thunderbolts.

New P-47's arriving in Britain during early 1943 were assembled by the British Reassembly Division. These Thunderbolts sit in company with a Lockheed Ventura and a Hudson. In the background is a rare Brewster Bermuda.

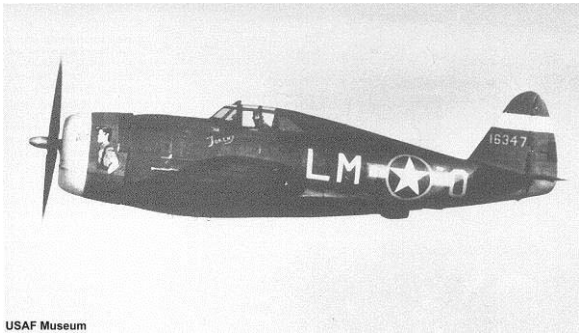
Almost as soon as they set up shop in their new quarters, they began to hear from RAF pilots that the P-47 just can't hope to cut it with the "Jerry fighters". Even members of the 4th Fighter Group announced that the P-47 was a 'deathtrap', and were quick to tell the pilots of the 56th that; "if our Spitfire Mk.V's couldn't deal with the Focke Wulf 190, how can you expect to handle them in that huge P-47?" Little did they know that not only could the Thunderbolt handle the Fw 190, it would chase them from the sky over western Europe.

With three Fighter Groups setting up in Britain, the 8th Air Force hoped to have all three operational by mid February. This would not be possible due to problems with radios and engine troubles encountered during high altitude test flights. Many of the Pratt & Whitney engines were suffering from ignition breakdown and distributor leakage. This resulted in fouled spark plugs and serious loss of power. These problems would plague the P-47 for several months. By the end of the Spring of 1943, most of the teething woes will have been overcome.

Typically, this is how most P-47's arrived in England. The extent of the effort required to get these fighters operational can be appreciated.

Finally, on March 10th, the 4th Fighter Group went on operational status. They fly an offensive fighter sweep over France. 14 Thunderbolts, accompanied by an even dozen Spitfire Mk.V's, (still remaining with the 4th FG) head out to gain some combat experience in their new fighter. They are ignored by

the Luftwaffe. Several of the 4th's pilots assigned to the Thunderbolts refuse to fly it. The P-47 is very much disliked by these veterans of the Eagle Squadron, who prefer their Spitfires. This first mission does nothing to reduce their unhappiness. Radio communication was all but impossible due to interference. The attitude of the 4th FG was not just the result of having to fly a fighter they believed to be unsuited for aerial combat with the Luftwaffe. Their experience during work ups was not very positive. Some pilots were forced to bailout due to fires. Others suffered landing gear collapse on landing. Still others suffered engine failures. They flew their first combat sweep with virtually zero confidence in the P-47.



USAF Museum

This P-47C-5-RE is piloted by Eugene O'Neill of the 62nd FS, 56th FG. Note the Li'l Abner cartoon nose art. This was the typical P-47 flown by the 4th, 56th and 78th Fighter Groups in the spring and summer of 1943. This aircraft has been updated in the field to include the new bulged keel plumbed for an external drop tank.

What most pilots did not understand was that most of the problems were a result of the hasty assembly work performed in England. Each aircraft would need a great deal of attention to iron out the bugs. Republic technical personnel worked long hours rectifying the problems.

During the first week of April, all three P-47 Groups (4th, 56th and 78th) are formally declared operational. On April 8th, all three Groups turned out for a joint fighter sweep over France. Once again, the Luftwaffe ignores their presence. Several more sweeps are flown during the following days, all uneventful. Finally, on April 15th, Major Donald Blakeslee, of the 4th FG gets the P-47's first kill by shooting down an Fw 190 near Dieppe. Two weeks later, the 56th loses two Thunderbolts when bounced by Focke Wulfs. They fail to shoot down any of their attackers. These lost fighters are replaced with the first P-47D models to arrive in the theater. Externally, the difference between the early D models and the P-47C is virtually undetectable to the untrained eye. The single most important difference is that the D models are equipped with water injection, that provides for greater power when the throttle is advanced to Combat power.

This unknown pilot of the 56th FG managed to nurse this battered P-47 home after taking a flak hit over Dieppe. It must have taken great skill to bring home this Thunderbolt.

With the coming of May, escort operations begin. The 78th claims one German fighter and two probables while escorting heavy bombers to Antwerp. In exchange, three of the 78th's P-47's fail to make it home. The 56th is doing even worse. After 31 combat missions, they have yet to claim a single enemy fighter against their several losses. Eventually, they score their first victory during a sweep over Rouen on June 12th. On the very next day, Robert Johnson got his first kill, blasting an Fw 190 to pieces. However, on June 26th, the 56th lost five Thunderbolts with four more shot to pieces. All they can claim is two German fighters.

Several P-47D-2-RE fighters on a British airfield, circa July 1943. Not uncommon at the time, many P-47's operated off of unpaved sod fields.

It was on this mission that Johnson's P-47 is crippled by enemy fire. Refusing to break formation (after being chewed out for doing just that when he gained his first victory) Johnson repeatedly tried to warn his Group of attacking Fw 190's. For some reason, no one heard his frantic radio calls. Johnson's fighter was clobbered by German 20mm cannon shells. The engine was hit, the hydraulic system shot out, spraying Johnson with fluid. His canopy was jammed closed and his oxygen system destroyed. The leaking hydraulic fluid and oxygen came in contact with each other and burst into flame inside the cockpit. Fortunately, it was only a flash fire, but Johnson was properly singed, losing his eyebrows and taking on the appearance of a cooked lobster. Having flown without his goggles (they were being repaired), the mist of hydraulic fluid nearly blinded him and caused swelling that threatened to eliminate what limited vision he retained.

Without oxygen, hypoxia began to cloud Johnson's reasoning. In a panic, he fought to get out of the wrecked P-47. The canopy would not slide back more than a few inches. Jamming his feet against the shot up instrument panel, he pulled with all his considerable strength. No luck, it would not budge. One of the side plexiglass panels had been blown out of the canopy. Johnson tried to squeeze through it, but his parachute snagged. No sense in climbing out unless he brings his chute with him. What to do?

This well known photo shows the bottom portion of Johnson's rudder having been blasted away by 20 mm cannon shells.

While Johnson was struggling with his situation, the P-47 was rapidly descending. As he lost altitude, the effects of hypoxia were wearing off and the cobwebs began to dissipate. Quite suddenly, it dawned on him that the Thunderbolt was actually flying. Upon this realization, Johnson decided to see how far he could nurse it towards the English channel. He eased off the throttle and the Pratt & Whitney radial stopped its shaking. The big fighter answered its controls with authority. Johnson was elated. Maybe, just maybe, he could make it home.

Then he saw it. Sliding in from his left rear, a fighter closes in. But, whose fighter? Then, he recognized it. A beautiful but deadly Fw-190 with a gleaming yellow nose. Flying just off Johnson's wing, the German pilot scans the shot up P-47. Wondering what is going through the German pilot's mind, Johnson watches as he eases away and swings around in a graceful turn; sliding in behind the Thunderbolt. Knowing full well what's to come, Johnson grabs the seat adjuster lever and drops the seat full down where he is afforded the full protection of the armor plate behind the seat. Johnson thinks to himself; "let him shoot, this Thunderbolt can't be hurt anymore than it already is." The Fw 190 opens up on the flying wreck. Like hail on a tin roof, 7.92 mm rounds pour into the Jug. What, no 20 mm? Thankfully, these have all been expended in some other fight. Johnson sits, hunkered down behind the armor as the German pilot ripsaws the battered Thunderbolt with hundreds of rounds.

Finally, his anger building, Johnson decides that he must do something. Kicking hard right and left rudder, the big fighter yaws right, then left. This scrubs off speed and caught off guard, the German cannot avoid over-running the P-47. Johnson sees him go by, but is unable to see anything through his oil covered windscreen. Shoving his head out through the shattered canopy, Johnson sees the Fw 190 turn gently to the right. Seeing an opportunity, he kicks hard right rudder, skidding the Thunderbolt, Johnson depresses the gun switch button. A stream of tracers heads towards the German fighter. But, it doesn't falter.

Instead, it continues around in a perfect turn and slides in alongside the perforated P-47 once again. Johnson makes eye contact with the German pilot. He can see the dismay on the German's face. There is no way that this American fighter can still be flying. It is impossible that it could absorb such a pounding and keep on flying. The Focke Wulf eases out to the right, and slides back into perfect firing position once again. Johnson cowers behind his armor plate as 7.92 mm bullets rain upon the

utterly mangled Thunderbolt. Just when Johnson is convinced that it will never stop, he stamps down hard on the rudder pedals again. This time the German expects just such a move and pulls off his throttle. The dappled 190 eases up on Johnson's wing once again, the German pilot shaking his head in silent amazement. They fly this way for several minutes. Finally, the German waves an informal salute and slides in behind Johnson's invulnerable fighter for the third time. As before, the Jug is pounded by streams of lead. The Fw 190 swings gently from left to right, spraying the indestructible P-47 with an incessant barrage of machine gun fire. Suddenly, it stops. The Focke Wulf eases alongside again. The German looks over the Thunderbolt. The pilot stares with a look of admiration on his face. Pulling even with Johnson, the 190 wags its wings in salute and peels away in a climbing turn. Having fired his last rounds at the stubborn Jug, the German heads for home, certainly convinced that the mauled fighter will never make home.

Another well known photo showing the damage to Johnson's canopy that caused it to jam. The large holes are from 20 mm cannon hits. The smaller holes are mostly from 7.92 mm bullets.

Finally free of the Focke Wulf, Johnson suddenly realizes that during the entire attack, he had depressed his mike button. Releasing the button, the accented voice of an Englishman fills his headphones. "Hello, hello, climb if you can, you're getting very faint". It was Air-Sea Rescue. They had heard the entire fight, including Johnson cursing his tormentor. Johnson's spirit soars, and he responds, "I'll try, but I'm down to less than 1,000 feet". Shouting with joy, he eases back on the stick. Not only will the Thunderbolt fly, hot damn, She'll climb! Slowly, Johnson nurses the P-47 up to 8,000 feet. The big fighter hauls herself up, instilling greater confidence in a man who was ready to bail out but a few minutes before. "Blue four, blue four, I have you loud and clear. Steer three-four–five degrees."

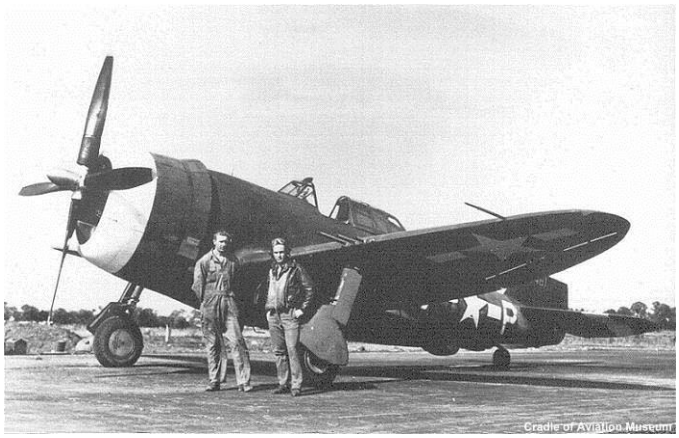
"I can't do that mayday control, my compass is shot out" answers Johnson.

The calm British voice issues instructions to "turn slightly right", and continues to provide course corrections until, after 40 minutes Johnson spots the coast of Dover through broken clouds. Directed to an emergency airfield, Johnson circles but cannot spot the sod runway. After checking his fuel, he pushes the mike button;

"Mayday control, this is blue four, I'm ok now. I'm going to fly onto Manston. I'd like to land back at my outfit."

Johnson continues on to Manston. Contacting the tower, he describes his situation. The last test comes as he moves the landing gear lever to the "down" position. Not only does the gear drop and lock, but by some miracle, the tires have not been hit. Easing onto the grass, Johnson has no flaps and no brakes. The big fighter does not slow and is heading towards a row of RAF Spitfires and Typhoons parked at the end of the runway. In desperation, he stomps on the left rudder pedal. The

Thunderbolt ground loops and slides backwards in between two of the British fighters just like it had been parked there.



Robert Johnson and his crew chief, Pappy Gould, pose in front his new P-47D-5-RE. This fighter was the replacement for his battered and scrapped P-47C. Johnson would name the new fighter "Lucky".

Slowly, Johnson gathers his wits and removing his parachute, squeezes out of the shattered canopy. Once on the ground he realizes the extent of the damage. Not only to the plane, but to himself. A bullet had nicked his nose. His hands were bleeding from the shrapnel of 20 mm shells that exploded in the cockpit. Two 7.92 mm rounds had hit him in his leg. 21 holes from 20 mm shells are counted in the airframe. He quits counting bullet holes when he reaches 100. It seems as if every square foot of the fighter has a hole in it. Somehow, the P-47 had shrugged off the damage and refused to die. Johnson will recover quickly. The Thunderbolt will not. It was scrapped on the spot, very little could be salvaged that was not damaged.

Robert Johnson would go on to shoot down 28 (revised down to 27 after the war) German fighters, with 6 probables and 4 more damaged. After the war, Luftwaffe records indicated that Johnson might have shot down as many as 32 German fighters. Johnson flew 91 combat missions. On those missions, he encountered German fighters 43 times. In 36 of the 43 encounters, Johnson fired his guns at the enemy. A result of those 36 instances where he fired on German aircraft, 37 of those aircraft were hit; with as few as 27 or as many as 32 going down. Rather impressive for a pilot who flunked gunnery school.

Events were really beginning to speed up in the ETO. Yet, on the other side of the world, the P-47 was about to enter service against the Japanese. How successful would the massive Thunderbolt be against the lightweight and agile fighters of the Japanese Army Air Force and the much vaunted Zero of the Imperial Japanese Navy?

There were stark differences between the air war in Europe and that being fought over the enormous expanse of the Pacific. Recall that the limited range of the P-47 had presented some serious problems with bomber escort in the ETO. Now consider the situation in the vastness of the South Pacific.

General Kenney's 5th Air Force was deeply involved with the struggle of pushing the Japanese out of the Southwest Pacific area. The only Army Air Force fighter capable of bringing the war to the

Japanese was the Lockheed P-38 Lightning. Round trip missions frequently exceeded 800 miles for the Lightning. On occasion, the P-38 was required to venture more than 600 miles to find and attack Japanese air assets. For shorter range missions, various models of the Curtiss P-40 were most commonly used. Incredibly, some squadrons were still soldiering on with the P-39 Airacobra to very near the end of 1943.

General Kenney certainly preferred the P-38 over the P-47 because of the Lightning's remarkable combat radius. This is a P-38F-1-LO, a later sub-model of the P-38F type was used by the 5th Air Force.

Gen. Kenney had found that the P-38 was the answer to his dreams of taking the fight to the Japanese. With its very long range capabilities, 400+ mph speed and the inherent advantage of two engines, the Lightning introduced the Japanese to the next generation of high performance American fighters. For all of the P-38's attributes, one problem became evident. There would not be enough of them to go around. Operation Torch (the invasion of North Africa) had gobbled up all the P-38 fighters in Europe. Even the 8th Air Force was stripped of its Lightnings for Torch. Kenney was finding it increasingly difficult to obtain additional numbers of the big, long ranging twin. Another dilemma facing Kenney was that many of his existing P-38's were older P-38F and G models with considerable combat hours in their logbooks. It would not be long before many of these would be officially classified as "war weary".

Kenney was offered a choice of several other fighters in its stead. However, the 5th was already well populated with the P-40 Warhawk. The performance of the P-40 was only adequate at best. Its range was limited, which largely meant that it was not suitable for many of the 5th's mission requirements. There was but one other option, the new P-47 Thunderbolt. The word had filtered down to the 5th that these were hot fighters. However, that would be of little value because the Jug had shorter legs than the Curtiss P-40. Without external drop tanks and a remarkable thirst for avgas, the P-47 could not even match the Warhawk's combat radius. Kenney was handed the hot potato when Gen. Hap Arnold offered him a newly trained P-47 Group. Kenney, who was never one to look a gift horse in the mouth, promptly accepted.

The 348th Fighter Group arrived in Australia on June 30th 1943 with their P-47D-2-RE Jugs. Just as in Britain, the Thunderbolt made an immediate impression upon the RAAF personnel. Reportedly, as a P-47 pilot climbed down from the cockpit, one Aussie ground crewman inquired; "Where is the rest of the crew?"

Thunderbolts from the 348th FG head out from Eagle Farm. Note that they are carrying two 165 gallon drop tanks designed for the P-38.

As the 348th settled into temporary quarters, Kenney went to work on increasing the range of the potent new fighter. He set his engineering staff to work designing a suitable external drop tank. Once the design was finalized, Kenney contracted with Ford of Australia to manufacture the tanks. By middle August, the first tanks arrived and were fitted to the Thunderbolts. The tanks were big and ugly, but they held 200 gallons of fuel, which nearly doubled the P-47's combat radius. Now able to range out further than the P-40E, the Jug could now reach out to the Japanese where previously no single engine fighter could go.

After some time for orientation, the 348th went operational. Lt.Col. Neel Kearby commanded the Group and led them into combat. Kearby understood the tactical advantages of the P-47. He knew that the Japanese had no aircraft that could counter the Thunderbolt's combination of speed, high altitude performance, firepower and ruggedness. Using these attributes to their best advantage, the 348th tore a swath through the Japanese while suffering minimal losses to the enemy fighters. Kearby was able to gain his first victory against the Japanese on September 4th and added a second on the 15th. On October 11th, 1943, Kearby would fly a mission that would eventually earn him the Medal of Honor.

Leading three other P-47's on a reconnaissance mission near Wewak, Kearby spotted a formation of Japanese aircraft far below his own cruising altitude of 26,000 feet. Kearby and his flight counted at least 12 bombers and an estimated 36 fighters as escort. Ignoring the lopsided odds, Kearby led the Thunderbolts down at high speed. Tearing into the Japanese formation, Kearby quickly splashed three of the escort while Captains Dunham and Moore each blasted a Ki-61 Tony into oblivion. Using his speed to zoom back up to 20,000 feet, Kearby planned on gathering his flight for another high speed pass. However, he spotted one of his flight with a pair of Tonys nipping at his tail. Rolling into a dive, Kearby came roaring down well in excess of 400 mph. In one pass, both Japanese fighters were fatally hit. Continuing right on by, Kearby ripped into yet another gaggle of Tonys. One of these went

down on fire. A second was likely shot down as well. Unfortunately for Kearby, his gun camera had run out of film and he could only claim the last Tony as a probable.

Kearby then assembled his flight and diverted to an emergency airfield. After landing, it was discovered that the four Thunderbolts had less than 300 gallons of fuel remaining between them.

With six confirmed kills and a probable, Kearby had set an Army Air Force record for the most victories during a single sortie. General Kenney quickly recommended Kearby for the Medal of Honor. General MacArthur signed the recommendation and forwarded it through channels. During the first week of January, 1944, MacArthur personally presented Kearby with the nation's highest decoration for valor.

In this well circulated publicity photo, John Wayne, an actor who played a fighter pilot in the movies, meets the real McCoy in the person of Neel Kearby.

Having taken up the goal of being the highest scoring ace in the Pacific, by March 5th, Kearby and Dick Bong were tied with 21 victories each. That day Kearby would lead his flight in a diving attack on a large formation of Nakajima Ki-43 Hayabusa (Oscar) fighters. Smacking down one of the Oscars on his first pass, Kearby's aggressiveness would lead him to violate a cardinal rule of aerial fighting in the Pacific: Never engage in a low speed turning fight with the agile Japanese fighters. Kearby hauled around in a punishing turn, trying to work his way onto the tail of another Hayabusa. That was a mistake. Virtually nothing could turn with the Ki-43 at speeds below 200 mph. Quickly three of the Japanese fighters had slipped in behind the slow moving P-47. Seeing Kearby's immediate peril, two members of his flight bounded into the Oscars. Maj. Blair and Captain Dunham each shot an Oscar off of Kearby's tail. The third Oscar managed to get a burst into the cockpit of Kearby's Thunderbolt. The P-47 went straight into the jungle below. There was no parachute seen. Kearby's killer had little time to celebrate his victory. Dunham exploded his Hayabusa seconds later. Dunham would finish the war with 16 confirmed kills. Kearby's own aggressive nature was directly responsible for his untimely death and ended his challenge to Bong. Kearby's total ended at 22. Bong would go on to be the leading American ace with 40 confirmed victories while flying the Lockheed P-38 Lightning with the much feared 49th Fighter Group, which would also fly the P-47 for several months.

As Kenney had expected, the Thunderbolt was proving to be a remarkably effective fighter against the Japanese. Unable to get any P-38's due to the demand in the ETO, Kenney was able to acquire

additional Thunderbolts to replace the worn out P-38's being flown by the 9th Fighter Squadron of the 49th Fighter Group.

The 49th flew a composite of fighters. The 7th and 8th squadrons flew a mixture of Curtiss P-40E's and P-40K's, with some newer P-40N aircraft arriving in October of 1943. The 9th transitioned from the over achieving P-40 to the P-38 in October of 1942. General Kenney handed the Lightnings to the 9th after practically stealing them from the 17th Fighter Squadron. By the fall of 1943, the 9th had pretty much used up the remaining Lockheeds. They needed to be replaced with new aircraft. However, since the P-38 was not available, Kenney decided to transition the "Flying Knights" of the 9th FS into the P-47D-5-RE.

The war weary P-38s of the 9th FS sit lined up. Note the odd looking pipe installed on the turbocharger
on the fighter in the foreground. This field modification provided additional "ram air".

To say that the pilots of the 9th were less than enthused with the P-47 would be nothing less than a gross understatement. These pilots had developed a deep abiding faith in the P-38. The security of two engines could not be underestimated. Especially when one considers the huge tracts of open ocean in the SWPA. Nonetheless, their tired Lightnings were becoming a maintenance nightmare. The constant use (and, some would say "abuse") and tropical conditions had combined to result in worn out engines, systems and electrical bugs that kept the squadron's mechanics working 18 hour days just to meet the basic operational requirements. In addition, the actual airframes were beginning to show the wear and tear of hard use. In short, the P-38s, mostly G models, were long overdue to be retired to less demanding training duty. Kenney ordered that the 9th transition to the P-47. On November 12, 1943, the remaining P-38s were handed over to a maintenance squadron and the 9th began training with the Thunderbolt.

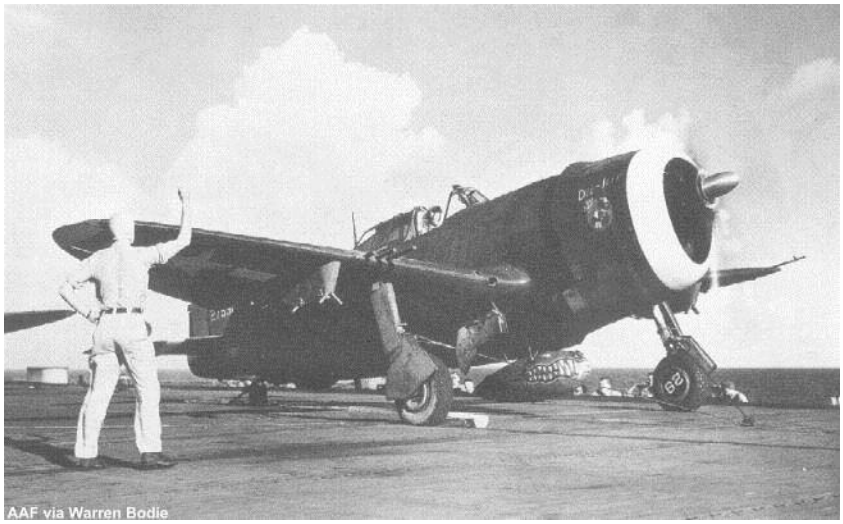
By late November, the 9th was declared as operational. The commanding officer of the 9th, Maj. Jerry Johnson, would get the squadron's first victory with the P-47. Yet, it was a victory that should have been passed up. Taking an opportunity to fly with Kearby's 348th FG, Johnson accompanied them on a sweep over Finschhaven (New Guinea). Spotting a radial engine aircraft flying about 3,000 feet above the jungle canopy, Johnson raced down and put a burst into the plane's engine. A parachute was observed.

This rare photo of Jerry Johnson's P-47 survived many months of South Pacific heat and humidity. Although washed out in the photo, there are 13 victory flags just below the windscreen.

Upon his return, Johnson was deeply disturbed to learn that the radial engine aircraft was not Japanese. Johnson had shot down an RAAF artillery observer flying an Australian built Wirraway (the Wirraway was essentially, a modified North American BT-9 which was the predecessor of the AT-6 and SNJ advanced trainer. Wirraways were built, under license, by Australia's Commonwealth Aircraft Corporation). The pilot of the Wirraway had escaped serious injury. Nonetheless, he was sufficiently rattled and angered to file a complaint with the 5th Air Force command. Johnson, in a successful effort to make amends, hand carried a case of bootleg gin to a very forgiving Flight Officer R.M. Stewart. 5th Air Force legend has it that General Kenney personally provided Johnson with the alcoholic bribe.

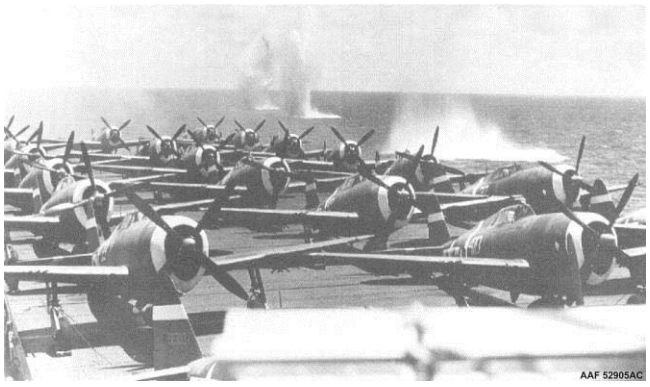
Some of the 49th's best. Top row, left to right; G. Laven, Jerry Johnson, CO Tice. Bottom row, left to right; Bob DeHaven, Wally Jordan, Duckbutt Watkins.

By the first week of December, Johnson was satisfied that the 9th was ready for combat. Shortly thereafter, the 36th Fighter Squadron of the 35th Fighter Group went operational with their new Thunderbolts. But, even as the P-47 began to operate in ever larger numbers, the air war was once again moving beyond the range of Jug. The Japanese were being forced to withdraw the bulk of their aircraft away from the rapidly growing Allied air strength. Opportunities for the Thunderbolts would be few and far between. The 9th FS operated the P-47 for just over four months. During the time that the P-47 flew operationally with the 9th, only 8 Japanese aircraft were downed. Once again, the P-47 had found itself limited in range and bringing the war to the enemy would require a longer ranging fighter. By April of 1944, hand-me-down P-38J Lightnings had become available and Kenney sent them to the 9th FS.



A 318th FG P-47D-11-RE runs up to full power as it prepares for a catapult launch from the deck of the
CVE Manila Bay off of Saipan. Note the artwork on the drop tank under the fuselage.

By mid 1944, the P-47 would be increasing used for close air support and tactical air strikes against the Japanese Army. Indeed, P-47s would be flown off of U.S. escort carriers to newly captured airfields on Saipan, and be used with great effect against Japanese air and land forces in the Marianas Islands.



The 318th Fighter Group was delivered to Saipan on two small escort carriers. This photo, taken aboard
the CVE Manila Bay, shows the deck crowded with Thunderbolts. Of greater interest is the large geysers of
water from exploding bombs dropped by Japanese bombers.

The P-47 would fight with distinction in the Far East. Flown by American and Allied Air Forces, the Thunderbolt would perform yeoman service in Burma and China. Yet ultimately, the P-47 would only be a bit player in the Pacific and China-Burma-India theaters. Until the arrival of the remarkable long range P-47N in 1945, the long range mission in the Pacific would be domain of the P-38 and later, the P-51 Mustang.

Feeling for the runway like a bicyclist feeling for the ground, this 1st Air Commando pilot risks a ground
loop with this one wheel landing. The risk is enhanced by the increased chance of a blown tire. Possibly,
this pilot is not yet comfortable with the Thunderbolt's high approach and touchdown speeds.

Back in the ETO, the Mustang was fast becoming the primary escort fighter. For the P-47, this meant a change of roles. Still the finest high altitude fighter in Europe, the invasion of France would thrust the P-47 into a new and far more dangerous job. Once again, the Thunderbolt would rise to the mission and ultimately, become one of the best tactical fighter-bombers in the Allied inventory.

As 1944 dawned over the European Theater of Operations, major changes were about to be made in the leadership and tactics of the American Air Forces. General Tooey Spaatz would serve under Eisenhower commanding the USSAFE. On January 6, Gen. Jimmy Doolittle formally relieved Ira Eaker as commander of the 8th Air Force. Doolittle allowed Gen. William Kepner to turn the 8ths escort fighters loose to hunt down and destroy the Luftwaffe wherever they could be found. This is worth noting, because no other order did more to eliminate the Luftwaffe as a viable threat than this. The introduction of "phased-escort" tactics did much to reduce the work load on the still too few long legged escorts such as the P-38 Lightnings and the P-51 Mustangs. Flight routing of the fighter escorts was planned to maximize endurance and allowed the shorter ranging P-47s to fly deeper into enemy territory. Such routing also permitted the long range escorts to remain longer over the target area. More importantly, phased-escort allowed fighter groups to be relieved, which in turn allowed them to head down to the deck and attack Luftwaffe airfields. It was not uncommon for large groups of Mustangs to attack anything and everything in sight from the heart of Germany all the way back to

the coast of France. Suddenly, no German airfield was safe from ambush. No Luftwaffe pilot could feel safe in the air or even on the ground. No railroad or autobahn was safe from swift and unexpected assault from the sky.

Beginning in hours of darkness on February 19-20, the 8th and 9th Air Forces along with the RAF began operation Argument. Also known as Big Week, this Allied air assault began with a heavy raid by the RAF on Leipzig. Before the fires were even brought under control, heavy bombers of the 8th pounded Leipzig again, along with Gotha and Brunswick. In theory, these attacks were aimed at Germany's war production plants and factories. In reality, these missions were primarily designed to draw the Luftwaffe into combat with the goal of grinding down their pilot manpower. Argument was successful in inflicting severe losses to the Luftwaffe's trained pilot corps. Ironically, actual German fighter production was increasing. Nonetheless, planes without pilots are still quite useless.

The pressure was kept up through March into April. Luftwaffe pilot losses were becoming critical. All the while, the emphasis was beginning to shift towards the destruction of German transportation assets in preparation for the expected invasion of France. The 9th Air Force was pounding coastal defenses from Calais to Cherbourg. Bridges and marshalling yards were being hammered on a daily basis by medium bombers. With each day it was becoming more difficult to move equipment from point to point in France. Simply driving down a roadway presented a high risk of being strafed by roaming Allied fighters.

Things were growing more desperate for the Luftwaffe in France. Allied bombers and fighters were also concentrating on putting every German aerodrome within range of Caen out of action. The Luftwaffe was forced to disburse aircraft away from airfields, even positioning fighters to use highways as runways. Things were rapidly becoming untenable for the German Air Force. By mid May of 1944, the Luftwaffe had ceased to be a factor over France. The Allies now had complete and unchallenged air superiority over the whole of western Europe, with total air supremacy over France.

Many of the 9th Air Force pilots became celebrated aces despite being generally assigned to tactical ground attack missions. Maj. Glenn Eagleston of the 354th Fighter Group ran up the highest score in the 9th. With no less than 18.5 confirmed victories, it is reasonable to speculate how high his total may have been had he flown with the 8th Air Force instead. Here Eagleston taxis in from a mission with the aid of a ground crewman giving taxi directions. It not possible to see over the Thunderbolts long nose while on the ground. Without a taxi director on the wing, the fighter would have to be taxied by zig-zagging from side to side while peering out of the front quarters of the canopy. This is a P-47D-

30-RE. The photo was taken in December of 1944. Note that the invasion stripes applied in June have not yet been removed.

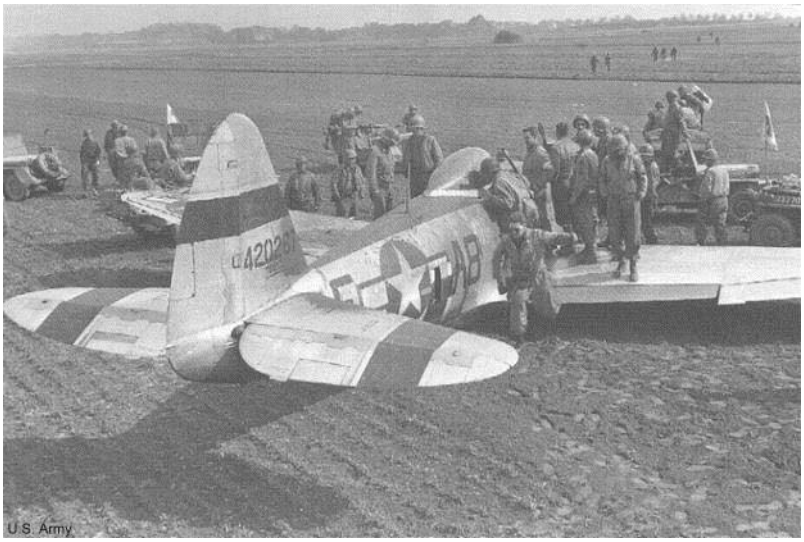
Adding to the already cascading woes of the German war machine was the effort being mounted to destroy Germany's ability to produce aviation and motor vehicle fuel. Refineries and storage facilities were getting worked over by the heavy bombers of the 8th and 15th Air Forces. One sure-fire method of keeping the Luftwaffe on the ground everywhere was to eliminate its sources of fuel. At long last, fuel had become a high priority target for the Allied bombers.

Along with the medium bombers of the 9th Air Force, the P-47, P-51 and P-38 were now being used with great effect in the role of tactical fighter-bomber. Of the three fighter types, the P-47 would prove to be the most widely used in this role and the big Thunderbolt would rival the RAF's Hawker Typhoon for the title of best air to ground fighter in the ETO. Many (including this writer) have since concluded that the Thunderbolt was superior to the Typhoon due to the greater resistance of its radial engine to battle damage. The big R-2800 did not have a liquid cooling system that could easily be punctured by enemy ground fire as did the Typhoon. Moreover, the Hawker fighter was powered by the infamously unreliable Napier Sabre H-24 engine. The Pratt & Whitney engine was by contrast, utterly dependable.

Here we see a portion of the 63rd Fighter Squadron (56th FG) flying in formation. In this group of P-47s we can see several different sub-models. These include several P-47D-25-RE and at least one P-47D-28-RE. The single "razor back" in the trailing section is probably a P-47D-23-RA. This photo was likely taken in July of 1944.

With the invasion of France (Operation Overlord) on June 6, 1944, the primary mission of Allied Air Forces was now focused on supporting the Allied army forces in Normandy. The Luftwaffe was all but eliminated from the equation. Only two German fighters had been able to reach the beaches on D-Day. 26 other German fighters and bombers were destroyed attempting to reach the landing area. None even got within sight of the beaches.

The Thunderbolt had already displayed its ability to use its eight .50 caliber machine guns very effectively against ground targets. Now, it would be employed as a fighter-bomber, delivering up to 2,000 lbs of bombs and rockets with great efficiency and accuracy against a wide range of German targets.



This Thunderbolt suffered disabling engine damage from ground fire in April of 1945. The pilot elected to execute a wheels up landing in a soft field. Damage to the fighter is minimal and it would be repaired and back in service in very short order. Certainly, such a spectacular landing will draw a crowd of onlookers. In this case American GIs swarm around the Thunderbolt to get a close look at what they had seen pounding the Germans all across western Europe.

Most missions were flown with a specific target designated. However, increasingly, the P-47s were being used to attack targets of opportunity. No German vehicle dared move in daylight without the great risk that roving groups of P-47s would spot the movement and swoop down with devastating results. The complete lack of Luftwaffe support contributed to falling morale among German troops. They knew with certainty that if they heard or saw any aircraft, it belonged to the enemy. The breakout of the American 1st and 3rd Armies into the interior of France was partially a result of overwhelming air attacks by the American 8th and 9th Air Forces. Many thousands of sorties were flown by P-47s in support of Operation Cobra, which sprung Gen. Patton's 3rd Army loose to envelope the major portion of German forces in France by closing their escape route between Argentan and Falaise.

The war in Italy was somewhat different than that in France. Italy is largely a mountainous country, and the progress of ground forces was very much slowed by expert use of this terrain by the Germans. P-47s served with great distinction in Italy. Flying with the 12th and 15th Air Forces, the Jugs performed every type of mission imaginable. Eventually, just as in the ETO, all 15th Air Force P-47s were transferred to the 12th Tactical Air Force, being replaced by P-51s. As in the ETO, P-47s still flew escort for medium bombers. However, their primary mission had become that of tactical fighter-bomber. One of the lesser known units serving in the war in Italy was the Brazilian squadron operating P-47s flying with the USAAF's 350th FG. The P-47 performed with the same outstanding effectiveness in the MTO as they did with the 8th and 9th Air Forces in the ETO.

This P-47D-30-RE served with Forca Aerea Brasileira in Italy. This Brazilian unit was attached to the 350th FG of the 12th Air Force. Note the dorsal fillet at the base of the rudder leading edge. This partially restored the flat plate side area of the bubble canopy P-47s. A larger and more effective fillet would be installed on the long range P-47N.

The principal model of the Thunderbolt in use at the time was the P-47D. These included several different sub-models of the D. It should be mentioned that there were no less than 21 individual sub-models of the P-47D alone. These included the P-47D-25-RE that began arriving in the ETO in May of 1944. The -25 was considerably different in appearance as compared to the previously manufactured models. The fuselage had been cut down behind the cockpit and a new bubble type of canopy replaced the old framed glass that had remained essentially unchanged since the YP-43. The new canopy presented the pilots with an unparalleled view outside of the aircraft. It did, however, actually cause an increase in drag, which reduced the maximum speed of the fighter by about 6 mph. On the positive side, the new Thunderbolt arrived with 100 gallons greater internal fuel capacity. This brought the total internal fuel load to 370 gallons. Finally, the P-47 had the range to fly as far as Berlin. Ironically, this new P-47 arrived when most Thunderbolts were about to be transferred to the 9th Air Force and used as tactical fighter-bombers. In point of fact, by 1945 every 8th Air Force Fighter Group was flying the P-51 Mustang with one notable exception. The 56th were allowed to keep their much loved Thunderbolts.

This P-47D-30-RE warms up on a snow covered taxiway prior to taking off on a ground attack mission during the Battle of the Bulge. Based only a short distance from the front lines, these fighters would frequently fly as many as four combat missions a day. Especially during the unexpected German attack through the lightly defended Ardennes forest. This fighter of the 356th Fighter Squadron will soon drop its 500 lb. bombs on luckless Wehrmacht troops trapped in a pocket of their own making. Note the quad .50 caliber machine gun anti-aircraft mount in the foreground. These airfields were close enough to the front as to expect Luftwaffe raiders at almost any time. Fortunately, the decimated Luftwaffe could rarely break through the Allied fighters. Nonetheless, forward airfields such as this were ready and alert for just that possibility.

Many of the Fighter Groups flying the P-47 in June of '44 were still flying some of the older "razor back" models with the framed canopy. These included the ultimate "razor back", the P-47D-23-RA. This Evansville built fighter was equipped with the latest Curtiss Electric paddle blade propeller. Of all the D models, this one was the fastest and best climbing.

As the war in the ETO progressed, the P-47 would pound the German army without let-up or mercy. Soon after the invasion began, 9th Air Force Fighter Groups were transferred from Britain to newly captured or prepared forward airfields not far from the front lines. This greatly shortened the response time required between receiving a call for air support and actually being able to deliver the support. In many instances, the Thunderbolts were based barely 5 minutes flying time from the battle area. By December of 1944, all tactical aircraft were based in France or Belgium.

This P-47D-27-RE of the 404th FG sits awaiting a mission. It has been fully armed with three 500 lb. bombs and four 5 inch rockets. Basing fighter-bombers close to the front greatly shortened reaction time and tremendously enhanced ground attack coordination.

With the coming of June '44, something besides the invasion of France was on the minds of the people of Britain. On night of June 12-13 the Germans launched the first of over 6,700 V-1 flying bombs. This was the first of Hitler's Vengeance Weapons. They created near panic in Britain. While not exceptionally effective weapons in a strategic sense, they were effective at pulling RAF resources away from prosecuting the war to defending the airspace over Britain. Moreover, the V-1 (and later V-2 ballistic missile) did more to hurt British home front morale than did the air Blitz of 1940-41. The British government turned to the United States for assistance.

Eventually, Republic was informed of the British request for a high speed interceptor specifically to chase down and destroy the V-1. Remarkably, Republic already had a solution in hand. This would take the form of the the incredibly fast P-47M-1-RE. Let's go back more than a year and see how Republic came to have this speedster in their vest pocket when the British inspired inquiry arrived.

These P-47M-1-RE fighters belong to the 56th Fighter Group. These are fitted with wing pylons for external stores. P-47Ms were originally produced without pylons, which were deemed unnecessary for chasing V-1 flying bombs. Once free of that duty, pylons were quickly added. The nearest fighter is that belonging to Lt. Col. Pete Dade.

The XP-47M was, essentially, developed collaterally with the XP-47J. The J was fitted with a high output version of the P&W R-2800. Specifically, the R-2800-57. This engine made 2,800 hp @ 2,800 rpm at 35,000 feet. This is in War Emergency Power. The aircraft actually attained 507 mph at an altitude of 34,300 feet. 2,800 hp is 133% of rated power. At military power (100%), the XP-47J could sustain 470 mph. 435 mph was attained at 81% of it's rated power (1,700 hp). All performance figures were obtained at 34,300 feet. The J model was an especially good climbing fighter too. It had a climb rate at sea level of 4,900 fpm. At 20,000 feet, it was still rocketing up at 4,400 fpm, and got there in 4 minutes, 15 seconds. Time to 30,000 feet was only 6 minutes, 45 seconds. Now that's an interceptor! Yet it had a usable range of 1,075 miles. Rather impressive performance. Nor was this a stripped down hotrod. It was fully armed and carried ballast in the wings equal to 267 rds per gun. The aircraft was flown to a height of 46,500 feet and was capable of a bit more.

Chief test pilot Lowery Brabham warms up the XP-47J prior to an early flight in November of 1943. Note the exceptionally tight cowling installation and spinner. This layout worked well, but was not adopted for production P-47s due to increased cost and complexity. However, a similar cowling was incorporated into the XP-72 little more than a year later.

Originally designed to defeat the FW-190 series fighters, the XP-47J certainly would have exceeded this requirement. In point of fact, with its critical Mach of .83, it had the potential to chase down Me-262's by utilizing a shallow dive, taking advantage of its superior service ceiling.

Despite this incredible performance, the XP-47J was really nothing more than a technology demonstrator. Meanwhile, the R-2800 C series was installed in another, more ordinary Thunderbolt P-47C. The purpose was to trade a little performance for simplicity of manufacture. The idea being that a minimum of changes were required to the current aircraft for the C series engine.

The aircraft that resulted was designated the XP-47M. Not "officially sanctioned", the XP-47M was an "in-house" development program. The "M" was painted in chromate yellow to distinguish it from the run of the mill C and D models. Likely, this overly bright paint scheme was selected to indicate it's test status in order to prevent over-zealous P-47 and F6F pilots from making mock attacks, as was the standard rule of the day over wartime Long Island.

Right out of the starting gate, the XP-47M the horse to beat in terms of speed. The XP-47M proved to be nearly as fast as the XP-47J. 488 mph was obtained on at least one flight. The official maximum speed is 470 mph. However, over-boosting the engine could tweak another 15 to 20 mph out of the big fighter. Some may find this next tidbit hard to swallow, however, the test documents still exist.

During durability testing of the C series R-2800 by Republic, it was decided to find out at what manifold pressure and carburetor temperature caused detonation. The technicians at Republic ran the engine at extreme boost pressures that produced 3,600 hp! But wait, it gets even more amazing. They ran it at 3,600 hp for 250 hours, without any failure! This was with common 100 octane avgas. No special fuels were used. Granted, the engines were largely used up, but survived without a single component failure. Try this with Rolls Royce Merlin or Allison V-1710 and see what happens.

As mid June of 1944 arrived, so did the first of Germany's Vengeance weapons. Flying at speeds right around 400 mph., the V-1 was not easy to intercept prior to flying over populated areas, where knocking it down could have a worse effect than leaving it alone. Many of the RAF's latest fighters

were thrown into intercepting the "Buzz Bombs", preferably over the English Channel. Tempests, late Mark Spitfires and even the jet powered (but not especially fast) Meteors were put to work intercepting the deadly "Doodle Bugs".

Upon the USAAF being informed of the XP-47M, three YP-47M development aircraft were immediately ordered. These were built using P-47D-27-RE fighters straight off the production line. Having already logged hundreds of flights with the XP-47M, beginning in mid 1943, Republic had a big leg up in terms of development time. Actual production P-47M fighters used the P-47D-30-RE as the basic airframe.

The production P-47M fighters did not reach operational status until after many of the V-1 launch sites were over-run by Allied ground forces. Deployed to 3 squadrons of the 56th Fighter Group, the new fighter likely did not chase very many flying bombs. Inasmuch as most aviation historians claim that the P-47M was designed specifically to intercept the V-1, it will come as a surprise to them to learn that the prototype existed more than a year before the first V-1 was launched at Britain. Moreover, the P-47D, deployed in large numbers, was certainly fast enough to overtake the V-1. It was only coincidence that the XP-47M and the R-2800 C series engines were available when the V-1's began falling on London.

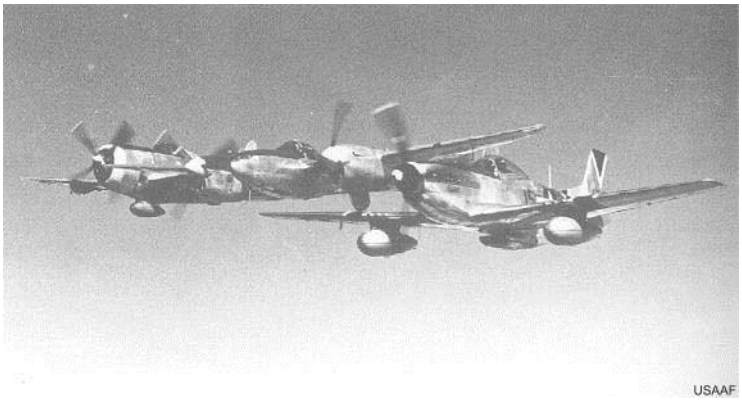
The new M models also suffered a fair amount of teething troubles. The C series engines suffered from high altitude ignition leaks and burned pistons. The 56th kept many of their older D models until the new M had its bugs corrected. Nonetheless, once sorted out, the P-47M was the fastest propeller driven fighter to see combat service in any Air Force in the ETO. Capable of speeds up to 475 mph, the M was a true "hotrod".

As the German army was pushed closer to the border of their homeland, newer sub-models of the P-47D found their way into service. The P-47D-27-RE arrived with an up-rated engine of 2,430 hp. and Hamilton-Standard propeller. The P-47D-28-RA was essentially the same aircraft, but used a Curtiss Electric prop. Some of the next to last sub-model, the P-47D-30-RE, incorporated a new dorsal fillet at the base of the rudder assembly. Virtually all of the final D model, the P-47D-40-RA had the fillet installed. The loss of side area due to the cutting down of the fuselage (to accommodate the bubble canopy), reduced the linear stability of the bubble topped Jugs. This could lead to a loss of control if rudder deflection was too great at low speeds. The fillet partially corrected this rudder force over-balance condition. It would not be fully eliminated until the final production model of the Thunderbolt. The P-47D-40-RA was the first P-47 to have the new K-14 gunsight installed at the factory. It was also the first Thunderbolt to carry the new tail warning radar equipment.

As the war in the Europe came to end in early May of 1945, the mighty P-47 Thunderbolt was to shoot down its last aerial adversary on May 4th. The victim was one of the speedy Me 262 jet fighters. By May 6th, only armed recon missions were being flown in the ETO. Two days later, the war with Germany was officially at an end.

While peace had come to Europe, war was still raging on the other side of the world. It was in the far reaches of the Pacific that the latest, and possibly greatest model of the P-47 would hurl itself at the Japanese. Too late to impact the war in Europe, the P-47N would set a new standard for single engine long range performance.

As North American Aviation's superb P-51 Mustang began arriving in the ETO, it became obvious that its combination of high performance and range would soon make it the dominant USAAF fighter. There was no other fighter available that could truly compare. The P-38 had adequate range and combat performance, however, it was suffering from a host of serious technical bugs that would greatly erode confidence in the big twin engine fighter. The P-47 still reigned supreme at high altitude. Unfortunately, the P-47D models in service in late 1943 lacked the range to penetrate very far beyond the western border of Germany. It was within this context that the command of the VIII Air Force made the decision that the Mustang would be the primary long-range escort fighter. The P-38 and P-47 would be reassigned to the IX Air Force where they would be used with great effect in the role of tactical fighter-bomber. Other factors weighed in the P-51's favor. Its initial cost was considerably less than the Thunderbolt and nearly half that of the P-38. The logistical advantages were noteworthy as well. A twin engine fighter certainly requires additional manhours to keep the aircraft combat ready. Two engines also use considerably more fuel for flight over a given distance. The Mustang's Packard V-12 was more fuel efficient than the large and powerful Pratt & Whitney of the P-47. It seemed that the Mustang would remain at the top of the USAAF heap.

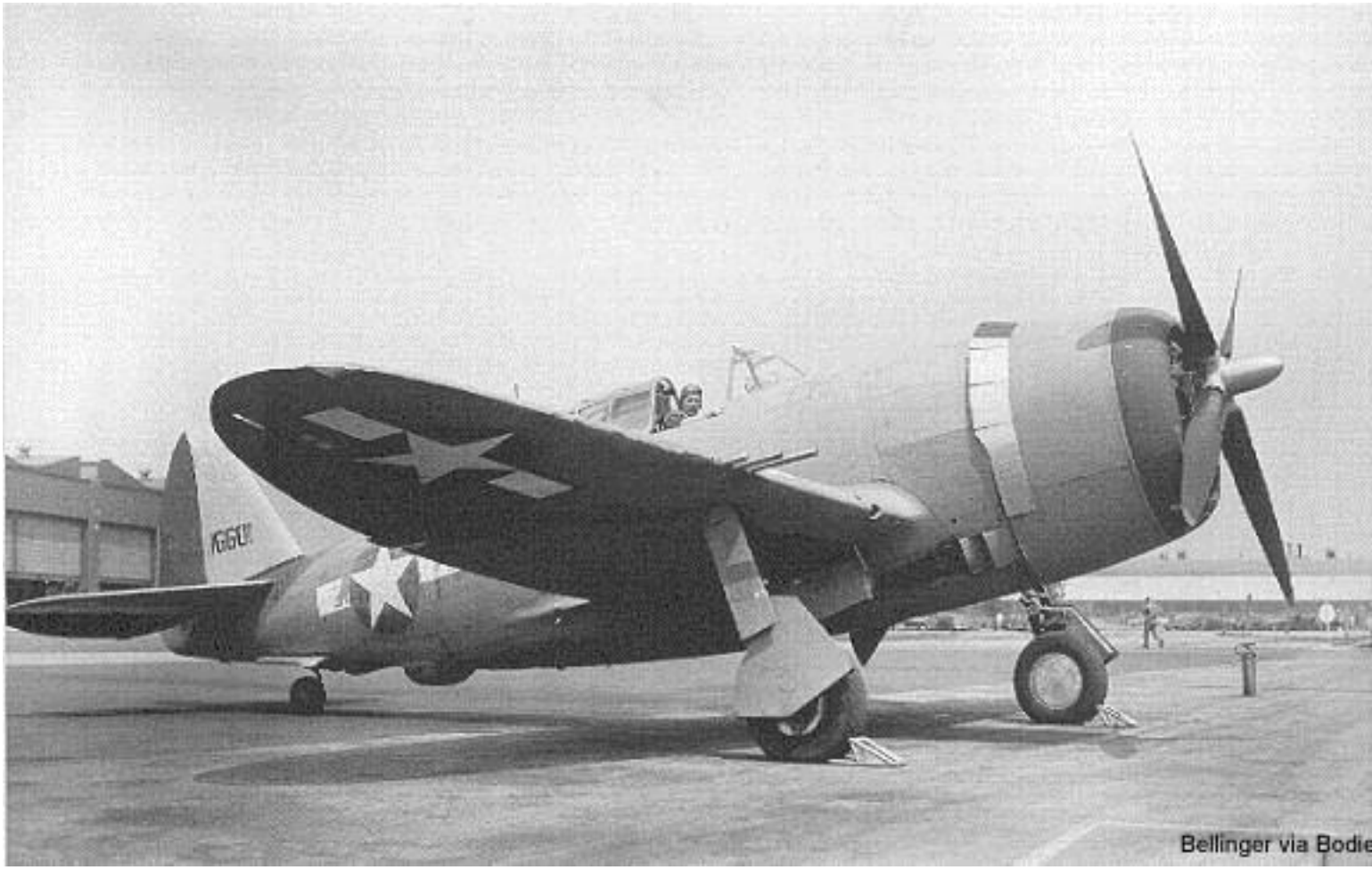


The Big Three of American fighters. Flying over Saipan in the tightest of formations are the fighters that devestated the Luftwaffe and the Air Forces of Imperial Japan. Within a few months the long ranging P-47N would join the P-38 and P-51 to wreak destruction on the Japanese over their home islands.

The adoption of the P-51D by the VIII Air Force and the transfer of most P-47s to the air to ground role was seen with foreboding by Republic. Combined with the Air Material Command's obsession with the Fisher (GM) XP-75 long range escort fighter, the sudden preeminence of the P-51 meant that there would be little reason for the USAAF to continue to purchase the Thunderbolt. The Mustang was a proven commodity, whereas the XP-75 would prove to be little more than a total failure. Nonetheless, the Air Material Command believed the hype coming out of Fisher and the War Production Board was persuaded by General Motors to order 2,500 of the P-75A (including 5 prototypes). These were never built once the USAAF realized that the XP-75 was totally unsuited in the role for which it was designed. Despite the wasted millions in much needed R&D dollars and the tragic misuse of skilled labor and factory space, the basic requirement still remained. The future need for adequate escorts for the B-29s expected to bomb mainland Japan would be the impetus for virtually all future fighter procurements. The latest models of the Thunderbolt, while possessing adequate range capabilities for the ETO, were not going to cut the mustard in the vast Pacific where a fighter would need a true combat radius of at least 1,000 miles. The latest P-47D-40-RA could not

quite make that distance, engage in combat and have anything resembling a fuel reserve for the return trip.

Fortunately, Republic had been paying attention to developments with the P-51 and were hard at work on a long range Thunderbolt as early as November of 1943. The same P-47C-5-RE that had been used as development mule for the Pratt & Whitney R-2800 C series was fitted with 27 inch long extension inserts in each wing. This was done largely to test the handling of the aircraft. No provision was made to carry any additional fuel in the wings. These tests revealed that the roll rate had suffered and the wings were clipped at the tips and a squared off cap was fitted.

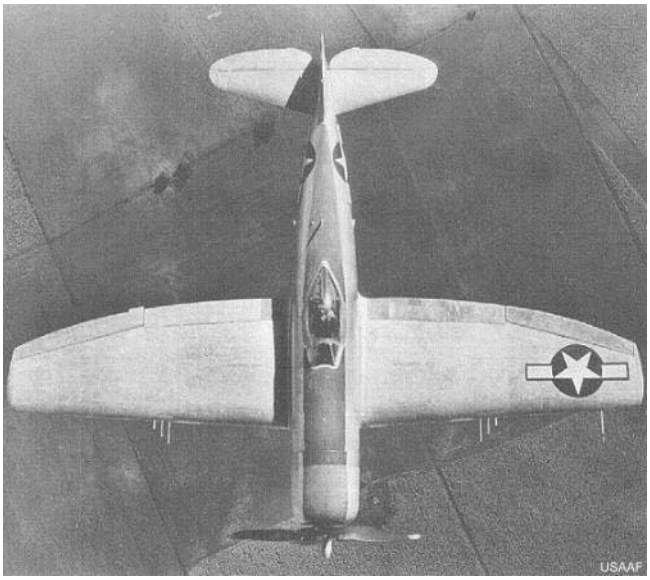


This is the only existing photo of the "unofficial" XP-47M test mule. After being used as a testbed for the Pratt & Whitney R-2800 C series engine, it was fitted with 27 inch long wing extensions (at the wing root), and used to test the flight characteristics of the modified wing. When the request for a long range Thunderbolt came along, this fighter was wheeled out, dusted off and presented to the Air Material Command. The photo shows the fighter prior to receiving the modified wing.

In May of 1944, an Expenditure Order was issued and $101,000 was allocated to Republic to develop a “wet” wing to be installed on one of the three YP-47M prototypes. Within 30 days Republic was able to present a test report based upon their earlier testing, along with a full set of drawings as a proposal to the Air Material Command. The new drawings illustrated the new wing design. The inserts were now just 18 inches in length, and contained an integral fuel tank for 100 gallons of fuel. In the

contract, the #3 YP-47M was specified as the test aircraft (S/N 42-27387). Twenty hours of flight time were expected after the new wing had been installed. In July, the fighter was officially designated as the XP-47N and the unofficial test mule was re-designated as a P-47C-5-RE once again. The final disposition of the test mule is unknown. It did, however, retain its new wings and the more powerful C series engine for as long as the aircraft appeared on the company inventory.

The modifications to the existing YP-47M were considerable. Aside from simply installing the wing inserts and fuel tanks, the flaps were required to be redesigned, and the ailerons had to be modified to fit with the new squared-off wing tips. Due to spacing the wings out from the wing root, the landing gear track increased by more than 3 feet. The overall wing span had increased to just over 42 ft 6 inches. The empty weight of the fighter had gone up by nearly half a ton to 12,950 lbs.

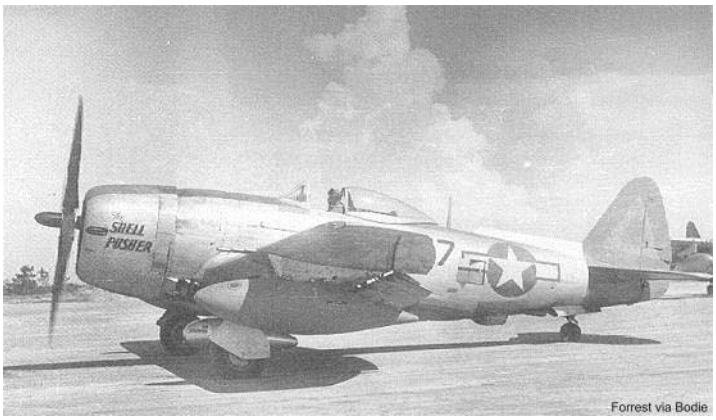


This wonderful view of the XP-47N shows its new wing planform to great effect. The squared-off wing tips makes P-47N indentification easy. Note that the Prototype fighter does not yet have the dorsal fillet installed.

The XP-47N took to the air for the first time on July 22, 1944. Test comparisons were made with a P-47D-30-RE throughout the early portion of the evaluation period. Much to everyone's surprise, the XP-47N, with its greater wingspan and higher weight actually proved to have better roll performance than the D model. At 250 mph TAS, the N attained a maximum roll rate just over 100 degrees/second. The P-47D-30-RE could manage but 85 degrees/second at the same speed. At higher speeds, the N widened the gap further. In mock combat with a P-47D-25-RE, the new fighter proved to be notably superior in every category of performance. In short, the XP-47 waxed the venerable D model regardless of who was piloting the older fighter. The new wing was part of this newfound dogfighting ability, however, the more powerful C series engine played a role too. The additional horsepower allowed the N to retain its energy better than the older Thunderbolt. Perhaps the greatest performance increase was in maximum speed. Though not as fast as the stunning P-47M, the heavier N was fully 40 mph faster than the P-47D-25-RE and could generate speeds 30 mph greater than its principal rival, the Mustang. Scorching along at 467 mph @ 32,000 ft., the N could not be caught by any fighter in regular service with any air force on earth with the single exception of its M model sibling. This combination of wing and engine had pushed the N model up to the top rank of the superlative prop driven fighters then in existence.

Republic employed some of the nation's finest test pilots to test the XP and YP-47N prototypes. The pilots pictured here posing with a new N model, standing, from left to right; unknown mechanic, Ken Jernstedt, J. Croft, Frank Simpson, and Parker Dupouy. Kneeling are; Carl Bellinger, Peter Collins, Fillmore Gilmer and another unknown. Jernstedt and Dupouy were both veteran combat pilots with Chennault's famous American Volunteer Group (AVG), also known as the Flying Tigers.

The testing program included determining the maximum range of the fighter. This was done with various combinations of fuel loads and external drop tanks. Ultimately, a test flight was made from Farmingdale to Eglin Field in Florida. The XP-47N took off with two 315 gallon drop tanks hanging from the under-wing hardpoints. Usable fuel in these tanks totaled 600 gallons. Added to the internal fuel load, the N eased off the runway with 1,170 gallons of fuel (usable). At a gross weight of 20,166 lbs., the Thunderbolt headed south in company with a P-47D chase plane. Arriving off the coast, east of Elgin in 3 hours, 44 minutes, the external tanks were dropped. Another P-47D, already waiting at Elgin, took on the N in a mock dogfight that lasted for twenty minutes. The throttle was advanced to military power for 15 minutes of this time, with an additional five minutes in the War Emergency Power (WEP) detent. After these fun and games were concluded the N was turned around and flown back towards Farmingdale. Heavy weather over Long Island caused the plane to divert to Woodbine, New Jersey. Having flown 1,980 miles, total fuel usage was measured at 1,057.5 gallons. There was still more than 112 gallons of usable fuel remaining in the main fuselage tank, enough for another 330 miles @ 1,700 rpm in auto-lean. The XP-47N was now the king of long-range single engine fighters (the all time leader of long range escorts was the P-38L-1-LO, which could claim a combat radius of nearly 1,500 miles under ideal conditions).



Lt. Robert Forrest performs his pre-takeoff run-up on the ramp at le Shima. This P-47N-2-RE is loaded with one 75 gallon drop tank and two 165 gallon P-38 drop tanks filled with Napalm. Forrest flew with the 463rd Fighter Squadron of the 507th Fighter Group.

Before the first production P-47N was built, that old bugga-boo of insufficient side plate area needed to be addressed. Lessons learned with the late models of the P-47D indicated that the dorsal fillet applied to those fighters did not provide quite the area required to fully offset the low speed rudder over-balance problem. The engineers at Republic designed a larger dorsal fillet and installed it on the XP-47N. This proved to do the trick, however, it was not an eye-appealing solution. Certainly, the approach taken by North American and Grumman was more attractive as well as functional. Then again, no one ever accused the Thunderbolt of being pretty.

This P-47N-25-RE would eventually find its way into the Cradle of Aviation Museum's collection. In this undated photo, the fighter appears in postwar livery. The ordnance under the wings is certainly deactivated for display. There even seems to be something akin to ETO invasion stripes on the bottom of the fuselage, just aft of the wing. This photo does illustrate the N model's unique dorsal fillet to good effect.

Eventually, 1,816 P-47Ns were completed before the cancellation of the contract after Japan surrendered. The big fighters were deployed to the Pacific and were beginning to demonstrate their full potential when two atomic bombs put an end to the conflict. After the war, most of the P-47Ns were allocated to Reserve and Air Guard units, where they served faithfully until they were replaced by jets in the mid 1950s. </FONT< B>

Bore sighting the guns on any fighter was meticulous work. To obtain the best result, all the guns were sighted to focus on a specific point. Often, the pilot would specify that point. This P-47N-1-RE served with the 318th Fighter Group operating out of le Shima.

With the outbreak of war in Korea in 1950, the P-51D (now designated the F-51D), was rushed into the fray and did solid work as a fighter-bomber. However, hundreds of P-47s were in service stateside and were never called into service against the North Koreans or later, the communist Chinese. Certainly, there was no doubt that the P-47 was better suited for air to ground close support. It could carry a far greater load of ordnance and was considerably more resistant to ground fire and flak. So, why was the P-47 (F-47) not used? The Thunderbolt's Navy alter-ego, the F4U Corsair, was used to great effect, and like the P-47, was far more rugged than the Mustang with its fragile Prestone cooling system. To this day, no one has adequately addressed this question. When the chips were down and the U.N. forces were pinned in the Pusan perimeter, where were the Thunderbolts?

This the same P-47N-25-RE, S/N 44-89444, shown earlier. Here it has been stripped of its postwar markings and has had the cowling ring and rudder tip painted yellow. It was in this condition that the fighter was transferred to the Cradle of Aviation Museum.

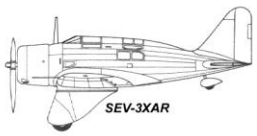
The P-47 would go on to serve in nearly every Air Force in the free world. It left behind a legacy that can hardly be matched by its contemporaries. Sure, the P-51 is virtually worshiped by its masses of

fans, but the Mustang could do nothing that the P-47, in its many guises, could not do or had already accomplished. Ultimately, more Thunderbolts were produced than any other American fighter in World War Two. The mighty Thunderbolt broke the back of the Luftwaffe and pounded the Wehrmacht without mercy. It proved to be too much for the Japanese to handle and was giving those same Japanese the identical working-over it had given the Germans. Then, it was suddenly no longer needed after the two atomic blasts that introduced the nuclear age to a world that to this day, lives under the threat of nearly instant mass destruction.

In this photo, the Museum's P-47N has been painted in wartime livery and is standing by to be moved to the display hanger. Today, the fighter is polished to a high gloss and is one of the finest examples of the P-47 line to be found anywhere.

Looking back at World War Two, we can see that before the days of stealth technology and smart weapons, real pilots took real airplanes into harms way. They depended upon the rugged reliability of their simple aircraft and their skills as pilots to get the mission accomplished and live another day to fly again. If anyone should desire to see a true definition of durability and versatility in W.W.II airpower, they need not look any further than the remarkable Republic P-47 Thunderbolt.

The P-47 Thunderbolt Evolution



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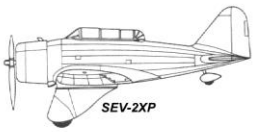

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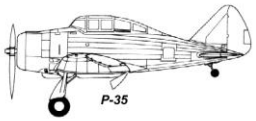

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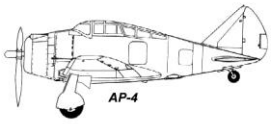

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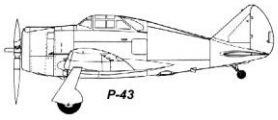

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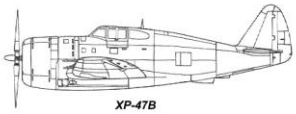
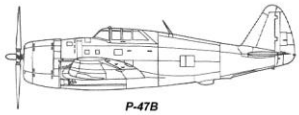


XP-47B



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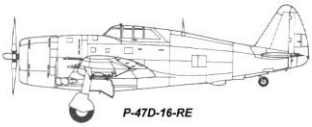
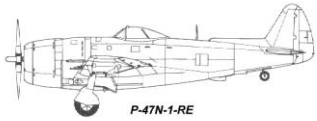


P-47D-16-RE

XP-47J

P-47D-25-RE

P-47D-30-RE



P-47N-1-RE

Afterward:

Special thanks is in order to my kind, generous friend and benefactor, Warren Bodie. Without Warren's wonderful research and terrific photos, this story would not have been possible. I can think of no one who can match Warren's knowledge of aviation and in particular, American WWII aviation. This story is as much a product of Warren's work as it is mine. In every sense of the meaning, Warren is the co-author of this story.

I would also like to offer my sincere thanks to Tom Gwynne and the staff of the Cradle of Aviation Museum. I was provided with generous access to materials and photos. The folks at CAM are deserving of much credit for their dedication to preserving the aviation heritage of this nation and specifically, that of Long Island, the true cradle of American aviation.

Corey C. Jordan *Warren M. Bodie*

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