

P-38 Lightning

in action



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 Aircraft Number 109
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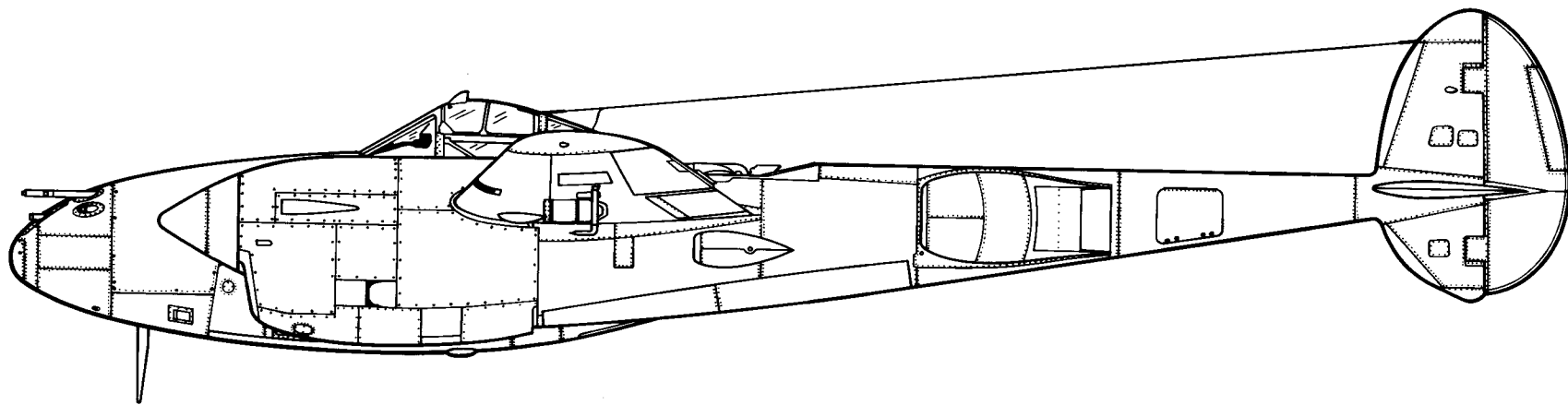
P-38 Lightning **in action**

By Larry Davis

Color By Don Greer

And Perry Manley

Illustrated by Joe Sewell



Aircraft Number 109
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On 26 December 1943, Tommy McGuire engaged a flight of Japanese Val dive bombers over Cape Gloucester while flying this P-38H named Pudgy II. During the fight, he shot down three Vals, bringing his total to sixteen confirmed victories.

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1115 CROWLEY DRIVE CARROLLTON, TEXAS 75011-5010

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ISBN 0-89747-255-1

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Dedication:

To Kelly — With Pleasure!

Acknowledgements:

Air Force Museum
Robert F. Dorr
Don Garrett, Jr.
Lockheed
Dave McLaren
Elmer Resslerand
Vaclav Simecek
Vincent Straus

SGT James V. Crow
Jeffery Ethell
Art Krieger
Ernie McDowell
David Menard
Eric Schulzinger
Hans-Heiri Stapfer

To the pilots of the German Luftwaffe the Lockheed P-38 Lightning was known as *Der Gabelschwanz Teufel* — The Fork-Tailed Devil. (Lockheed)

Wartime Poem

Lightnings In The Sky
Author unknown

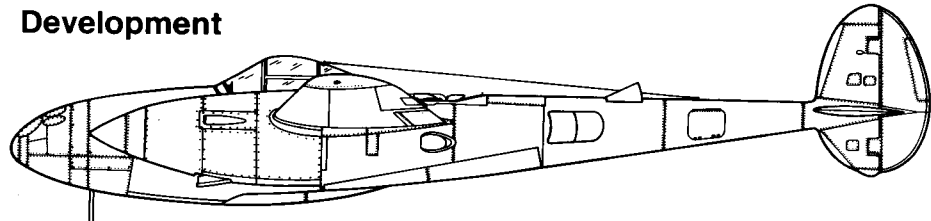
*Oh, Hedy Lamarr is a beautiful gal,
And Madeleine Carrol is too.
But you'll find, if you query,
a different theory
amongst any bomber crew.
For the loveliest thing
of which one could sing
this side of the Heavenly Gates,
is no blonde or brunette
of the Hollywood set,
but an escort of P-38s.*



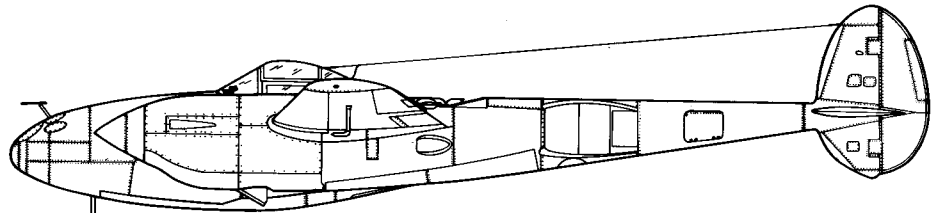
*Sure, we're braver than hell,
on the ground all is swell,
in the air it's a different story.
We sweat out our track,
through the fighters and flak,
we're willing to split up the glory.
Well they wouldn't reject us,
so Heaven protect us,
and until all this shooting abates,
give us courage to fight 'em,
and one other small item,
An Escort Of P-38s!*



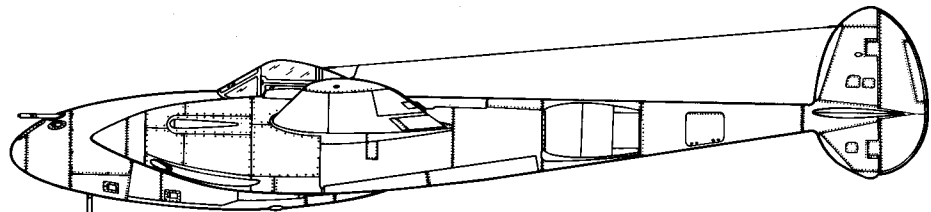
Development



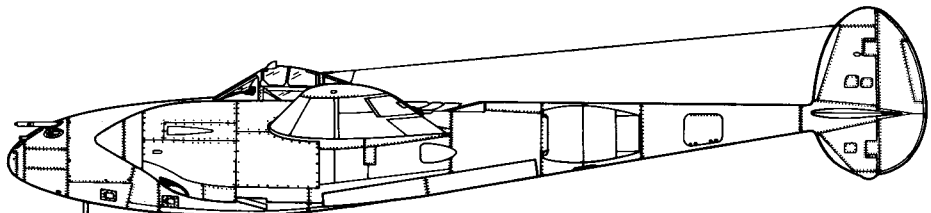
XP-38



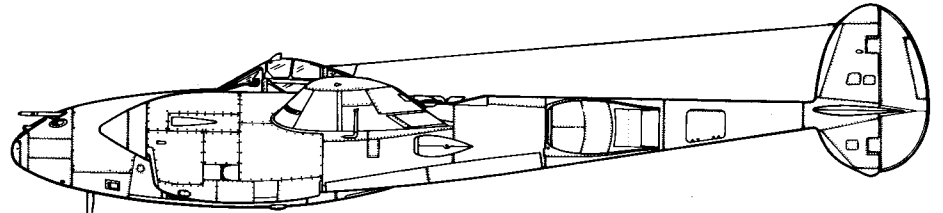
YP-38



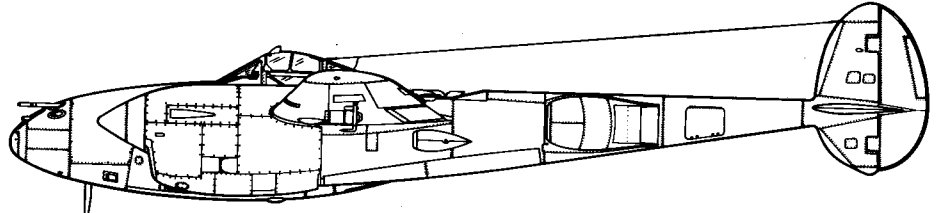
P-322



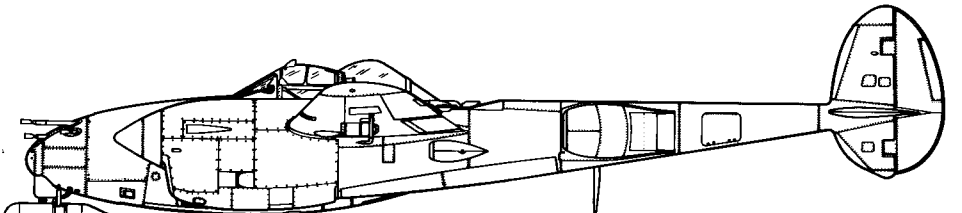
P-38D



P-38J



P-38L



P-38M

Introduction

Der Gabelschwanz Teufel (The Fork-tailed Devil) was the most recognizable fighter aircraft of the Second World War. With its twin engines housed in long streamlined nacelles and booms, twin tails and center fuselage pod housing the pilot, few could mistake the Lockheed P-38 Lightning for any other aircraft. When it was introduced during 1939, the Lockheed design immediately made every other fighter aircraft obsolete.

The P-38 was the first fighter to feature a tricycle landing gear, first with an all-metal flush riveted skin, first to have power-assisted controls, and the first turbo-supercharged fighter aircraft to enter squadron service. At the time it was the fastest and longest ranged fighter in the world. With all these firsts, one would think that the P-38 should have been the premier fighter of the Second World War. In the Pacific Theater of Operations it was. But a host of technical problems resulting from its high performance, combined with logistical politics within the U.S. Army Air Force, severely inhibited the Lightning from attaining its full potential.

The P-38 Lightning was a product of the Lockheed Aircraft Corporation. Alan Loughead (later changed to Lockheed) founded his aircraft company during 1916 and it failed during 1921. During 1926 he acquired a partner and restarted the company. His partner was another aviation genius, John K. "Jack" Northrop. Together they created the Lockheed Vega, Altair and Orion. But the faltering U.S. economy broke the company once more during 1931 and they closed the doors during early 1932. On 6 June 1932, the Lockheed Aircraft Company was purchased by Robert Gross, Carl Squire, and Lloyd Stearman for \$40,000.00. The new company's first commercial venture was the Model 10, or Lockheed Electra. It immediately set industry standards as the first all-metal, twin engine airliner.

Originally the Electra was to have a single vertical tail. But tests performed by a young graduate student at the University of Michigan wind tunnel revealed some probable stability problems. The brash young man who informed the Lockheed team of the potential problems was a budding aviation engineer named Clarence L. "Kelly" Johnson. When he informed Hall Hibbard, Lockheed's Chief Engineer, that his design had some flaws, Hibbard retorted, "Why don't you see if you can do any better!" Johnson immediately left Michigan and flew to California to join the Lockheed team. His first task was to iron out the Electra's problems by adding twin fins and rudders, a characteristic that would be found on almost all future Kelly Johnson propeller aircraft designs. Success followed with the Electra Junior and the Super Electra, which evolved into the Hudson bomber design. By 1938, Kelly Johnson was the Chief Engineer at Lockheed.

During late 1935, the Army issued a Circular Proposal to several companies for a new fighter aircraft. All the fighters of the era were very restricted in armament, with a maximum of 500 pounds of usable payload. This meant that normal armament consisted of one .30 caliber and one .50 caliber machine gun, plus ammunition. In order to get a more heavily armed aircraft into service, the Army Procurement Board established a new aircraft type — the interceptor.

An entirely new set of standards were written for the interceptor. Specification X-608 called for the aircraft to have a top speed in excess of 360 mph at 20,000 feet, the ability to fly at full throttle for over an hour, the ability to take off and land over a 50 foot obstacle within 2,200 feet, to be equipped with the most powerful turbo-supercharged engines available and to carry twice the armament of a standard fighter aircraft.

Kelly Johnson realized that the new interceptor class would have to be a twin-engine design to meet the new requirements. Johnson came up with six different design

ketches, all twin-engine. Several were remarkably similar to later designs from other companies, such as the deHavilland Mosquito and North American P-82 Twin Mustang. On 13 April 1937, Johnson submitted to the Army the Lockheed proposal for the Model 22 Pursuit Plane.

Johnson had opted for a design with the engines carried in long, tightly cowled nacelles which tapered back to twin booms ending in twin rudders. The fuselage was a center pod containing the pilot and armament. Power would come from the new Allison V-1710, liquid-cooled, 16 cylinder engine equipped with a turbo-supercharger mounted in the boom behind the engine. The tail configuration was the Kelly Johnson trademark of twin vertical tails joined by a large horizontal stabilizer. One new feature was the use of a butt-joined, flush-riveted, all metal skin, including the control surfaces. The design also called for the use of a tricycle landing gear. Finally, the armament was very heavy for a fighter of the time: four .50 caliber machine guns and one 25MM cannon.

Lockheed's Model 22 was slightly changed during September of 1937, with the design now calling for opposite-rotation engines, i.e. the propellers would turn in opposite directions. The prototype would be fitted with 1,150 hp Allison V-1710-C7 and -C9 engines driving three blade Curtis Electric propellers. The propellers each rotated toward the center fuselage pod.

There was no 25MM cannon available, so Lockheed opted for the Madsen 23MM cannon with fifty rounds of ammunition. The Model 22 was projected to have a top speed of 417 mph at 20,000 feet. Cruise range was estimated at 1,386 miles and time to climb would be 4.5 minutes to 20,000 feet. Based on this proposal, Lockheed was awarded contract AC 9974 which authorized one prototype under the designation XP-38.

Over a year later, in December of 1938, the hand-built XP-38 was completed at Lockheed's Burbank assembly plant. The official rollout and flight tests would not take place until the XP-38 was delivered to March Field. The XP-38 was disassembled, then trucked to March Field under strict security, where it was reassembled. Rollout took place during early January of 1939. The XP-38 was a beautiful aircraft with its sleek engine nacelles,

The XP-38's official rollout took place on 27 January 1939 at March Field, California, following a fourteen hour truck ride from the Burbank plant. The retractable air scoops under the engine are for the oil coolers, while the scoops on the top of the boom are exhausts for the radiators. (Lockheed)



long booms, bubble-style canopy and highly polished Alclad skin. The clean lines of the XP-38 were broken only by the retractable oil cooler air scoops under the propellers and carburetor and Prestone coolant air scoops near the rear of the booms. The canopy had a single piece, curved windscreen, with automobile-type side windows that rolled down, and a top cover that opened to the right. The supercharger was mounted on top of the engine nacelle, with a small scoop covering the supercharger intakes over the wing. The turbo-supercharger intercooler lines were routed through the leading edge of the wing for added cooling. Although the XP-38 carried the standard Army Air Corps markings of the era, the serial number (37-457) was not carried on the aircraft.

Following the official rollout ceremony, LT Ben Kelsey began taxi tests. Kelsey had been one of the original Procurement Board officers that had issued the X-608 Interceptor proposal and was now Project Officer for the XP-38. The first taxi tests brought the first problem, and the first delay, when the XP-38 lost its brakes and Kelsey put the fighter into a ditch. After repairs were made, Kelsey lifted the XP-38 into the air for the first time on 27 January 1939. It was almost the XP-38's last flight as well! The mounting brackets for the sliding Fowler Flaps broke, leaving the flaps dangling and causing the entire aircraft to vibrate uncontrollably. After seriously considering bailing out, Kelsey found that he could control the crippled bird by throttling back and bringing the nose to a very high angle of attack. After a harrowing thirty-four minute first flight, Kelsey brought the XP-38 back to March Field and a safe landing. Lockheed strengthened the flap supports and testing resumed.

Flight tests revealed a number of problems with the XP-38. The brakes were still marginal despite the addition of a handpump (for the pilot to increase brake pressure) and new brake linings. Longitudinal stability problems brought an increase in the size of the horizontal stabilizer (installed on the YP-38). Elevator buffeting began to appear and it was reasoned that this could be alleviated by reversing the propeller direction from inward toward the fuselage pod, to outward toward the wingtip. A redesign of the entire Prestone coolant system was needed to make the engine run cooler (and added about eight mph to the top speed). On 10 February 1939, after six flight tests totaling four hours and forty-nine minutes, LT Kelsey decided that the XP-38 was ready to be delivered to the Army.

LT Kelsey would deliver the XP-38 to Wright Field, near Dayton, Ohio. At 6:12 AM on 11 February 1939, Kelsey lifted off from March Field and headed East. Slightly over three hours later, Kelsey landed the XP-38 at Amarillo, Texas for fuel. Not knowing that this was a record breaking flight, the ground crew took their time with the refueling. After a twenty-three minute stop, Kelsey resumed the delivery flight to Ohio, landing at Wright Field at 3:07 pm Eastern Standard Time. He was greeted by MAJ GEN H.H. "Hap" Arnold, Chief of the Army Air Corps. Arnold told Kelsey to climb back into the XP-38 and try to break the Transcontinental Speed Record by flying on to Mitchell Field, New York.

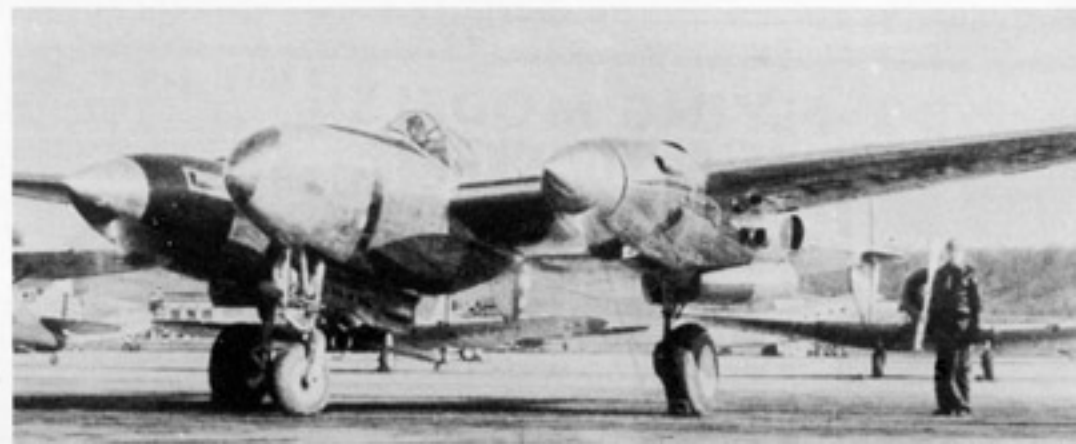
Screaming through the sky over Pennsylvania at better than 380 mph, Kelsey throttled back to land in record-breaking time at Mitchell Field. Not knowing who or what he was, the Mitchell Field tower controller told Kelsey that he was fourth to land, behind three Army PB-2As. Kelsey idled the XP-38 back and waited for his turn to land. Informed by the tower to begin his approach, Kelsey shoved the throttles forward — nothing happened! Kelsey tried everything, but the engines would not respond (it was thought that the long, slow approach caused the XP-38's carburetors to ice up). Kelsey could not gain enough power or speed to clear the trees at the end of the field. He hit the trees at almost 100 mph and bellied in on a golf course about 2,000 feet short of the runway.



LT Ben Kelsey checked the cockpit of the XP-38 while the aircraft was being refueled at Wright Field. Kelsey delivered the XP-38 to Wright Field on 11 February 1939, then tried to break the transcontinental speed record to New York. The XP-38 was destroyed when it crash landed on a golf course 2,000 feet short of Mitchell Field. (AFM)

Luckily for the P-38 program, Kelsey was unhurt in the crash; however, the XP-38 was totally destroyed. The fact that the XP-38 had achieved ground speeds in excess of 420 mph was proof enough of the design and the Army elected to continue the program. Three months after the crash of the XP-38, on 27 April 1939, Lockheed received a contract to build thirteen YP-38 service test aircraft. The YP-38s would incorporate most of the changes that the flight testing of the XP-38 had revealed. Three months after the issuing of the YP-38 contract, the War Department issued a contract to Lockheed to build sixty-six production aircraft under the designation P-38-LO.

LT Kelsey taxis the XP-38 at Wright Field at the beginning of the last leg of the ill-fated transcontinental speed dash to Mitchell Field on 11 February 1939. The aircraft had Flat Black anti-glare panels on the insides of each engine nacelle. (AFM)



YP-38 (Lockheed Model 122)

The YP-38 differed from the XP-38 in a number of ways. The use of Allison V-1710F series engines drastically altered the configuration of the engine nacelles. The F series engines had a reduction gear case fitted to the front of the crankshaft on which the propellers were mounted. This reduction gear case sat higher on the engine front, which raised the propeller thrust line several inches higher on the nacelle front. This in turn, led Lockheed engineers to redesign the entire forward engine nacelle.

The reduction gear case was used to rotate the propeller shafts in two different directions. The original C series engines had the propellers rotating inward toward the fuselage, while the F series engines had the propellers turning outward. The use of the outward rotating propellers eliminated a downwash which disturbed the airflow across the center wing section and eased the problem of tail buffet. The F series Allison engines were equipped with the General Electric type B2 turbo-supercharger, offering 1,150 hp at 20,000 feet.

The retractable oil cooler intake scoop on the front of the XP-38 engine nacelle was replaced with dual streamlined air scoops directly under the propellers, with a small air exit door on the underside of the nacelle just in front of the main landing gear wheel well. The small Prestone coolant radiator scoops on the rear section of the XP-38 booms were replaced with much larger radiator housings. The retractable radiator air exit doors on top of the nacelles were relocated to the rear portion of the radiator housings.

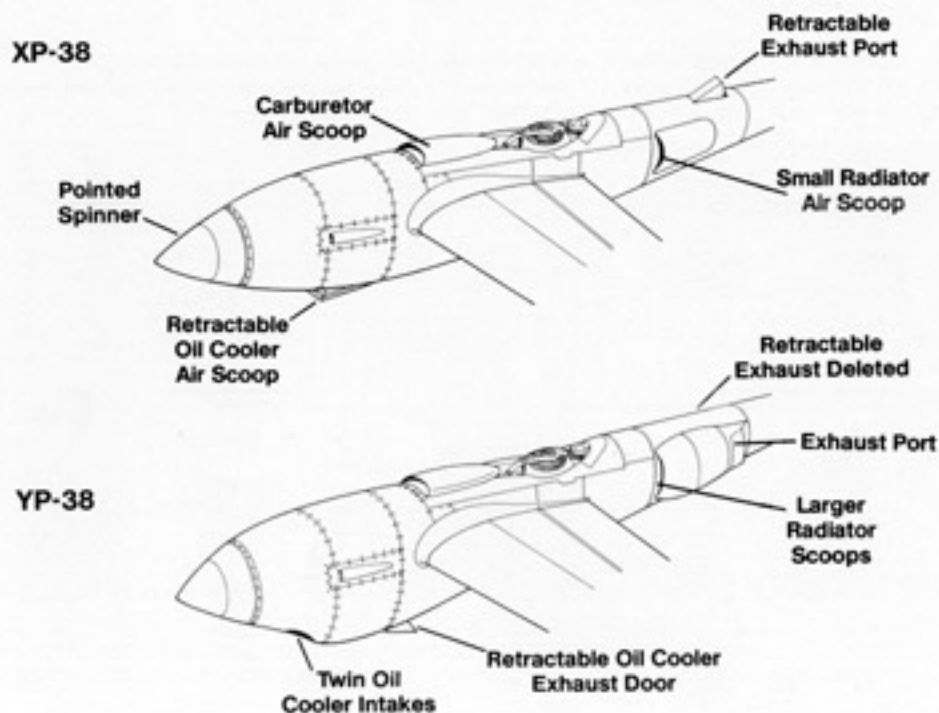
The first YP-38 was rolled out during September of 1940. The YP-38 had completely redesigned engine nacelles with the oil cooler air scoops under the propeller spinners and much larger radiators on the rear of the booms. The aircraft was equipped with a one piece, wrap around windscreen. (Lockheed)



Initially the YP-38 rolled out of the Burbank factory with the same single-piece, wrap around windscreen used on the XP-38. This was soon replaced with a rounded three-panel unarmored windscreen. Both the XP and YP-38 had the canopy cover hinged to open to the right. Another feature added to the YP-38 was external mass balances on the elevator. Tail buffeting due to poor airflow over the wing center section was becoming a serious problem. Army pilots erroneously referred to it as "elevator flutter" and the Army ordered Lockheed to add the external mass balances (the P-38 had internal balances). The tail buffet problem would not be solved, however, until wing/fuselage fillets were later added.

Armament for the YP-38 was specified to be one Browning M9 37MM cannon with fifteen rounds, two .50 caliber machine guns with 200 rounds per gun and two .30 caliber machine guns with 500 rounds per gun. With a full load of fuel and ammunition the YP-38 had a gross weight of 13,500 pounds. Rollout of the first of the thirteen YP-38 service test aircraft occurred during early September 1940, with Milo Burcham making the first flight on 17 September 1940. After extensive tests at both the Lockheed Air Terminal and Muroc Army Air Field, several of the YP-38s were delivered to Wright Air Development Center for further testing. The service tests, flown by pilots from the 1st Pursuit Group at Selfridge Field, began in the Spring of 1941. The cost of the thirteen YP-38s was \$2,180,725.00.

Nacelle/Boom Development





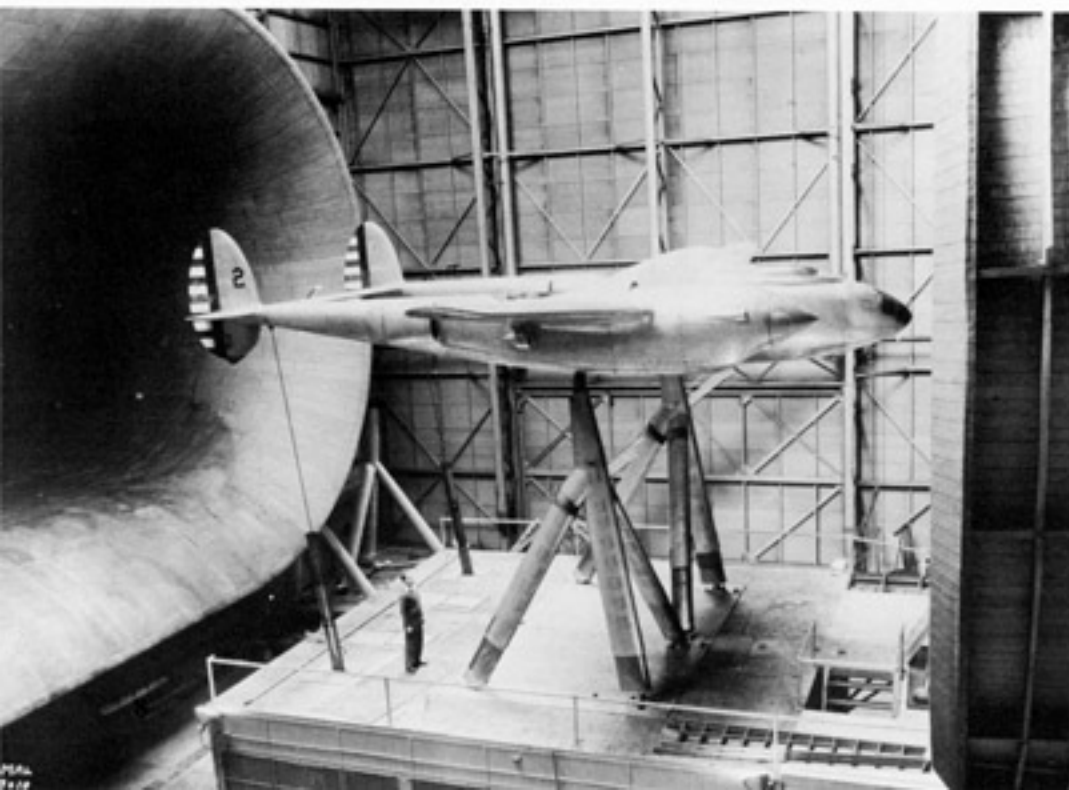
Lockheed Test Pilot Milo Burcham flies a YP-38 (39-689) over Los Angeles during late 1940. The YP-38 had an air scoop mounted ahead of the turbo-supercharger and external mass balances on the elevator. The open scoops under the engine nacelle are for the oil cooler exhaust. (Lockheed)



Lockheed Test Pilot Marshall Headie warms up the YP-38 on the Lockheed ramp prior to a test during September of 1940. The propellers on the YP-38 rotated in opposite directions — outward, toward each wingtip. (Lockheed)

The second YP-38 was installed on a jig in the full scale NACA wind tunnel at Langley Field, Virginia, to study the effects of tail buffeting on the airframe. The propellers were removed and the blade openings in the spinners faired over. (Lockheed)

Five of the YP-38 service test aircraft parked on the ramp at the Lockheed Air Terminal (LAT) in Burbank. These are late production aircraft with three-piece windcreens and mass balances on the the upper and lower elevator. The aircraft visible inside the hanger was the P-322 prototype. (Lockheed)



Lightning I (Lockheed Model P-322)

The Lockheed P-322 Lightning I was built to British specifications and was based more on the XP-38 than either the YP-38 or P-38-LO. The P-322 was powered by the same C series Allison engines as the XP-38. These differed, however, in that the propellers both rotated in the same direction, toward the right.

In addition, the V-1710-C15 engines used in the P-322 were unsupercharged, with a power rating of 1,090 hp at 14,000 feet. There were two reasons for the deletion of the turbo-superchargers from the British specification. First was availability of the units. American needs for the General Electric turbo-superchargers was such, that all requests by other nations had a much lower priority making it difficult to obtain this vital equipment. It took everything that General Electric had just to keep up with the demands of the B-17, B-24, P-43, and P-38 production runs. The second reason for deletion was maintenance. The turbo-supercharger was a complex piece of equipment and the British simply did not have the time or resources to train people to properly maintain the units.

The P-322 Lightning I was built to Royal Air Force requirements. The P-322 was powered by unsupercharged Allison C-series engines in tightly cowled engine nacelles which differed from earlier P-38s and were unique to the P-322. (Lockheed)



Externally the P-322 Lightning differs from the P-38 in the shape of the forward engine nacelle. With the installation of C series Allison engines, the propeller thrust line was lowered (as on the XP-38). The P-322 had oil cooler scoops in the nacelle fronts under the propellers (similar to the YP-38); however, the openings were slightly more streamlined, more circular in opening and further back on the nacelle than the YP-38/P-38-LO. The engine exhaust, instead of being routed back to the turbo-supercharger, exited through two exhaust stacks on the upper side of the nacelle over the wing. The aircraft also had the larger radiator housings used on the P-38LO.

The center fuselage was identical to the P-38 except that it was outfitted with an RAF style control wheel, British radio equipment and other items of British specified/supplied equipment. The RAF specified an armament of two .30 caliber machine guns and two .50 caliber machine guns, deleting the cannon armament of the P-38s.

The P-322 also had the retraction linkage arm on the nose wheel strut relocated from the front of the strut to the rear of the strut. This, in turn, allowed the nose gear wheel well to be shortened and made more room available in the nose for ammunition. This feature was not incorporated on U.S. P-38s until the P-38E.

Finally, it was on the P-322 that the problem of tail buffet was finally solved. After extensive tests, Kelly Johnson felt that it was disturbed airflow over the wing center section that caused the elevator flutter. He designed a set of wing root fillets for the juncture of the wing root and fuselage. The airflow was smoothed out and most of the elevator flutter problems were cured. The problem of compressibility, however, still remained.

Contracts with the British and French governments were for a total of 667 Lockheed Model 322 fighters. It was the British that named the aircraft the Lightning during March of 1940. Both the British and French viewed the Lightning as a ground attack aircraft rather than a high altitude interceptor. The Model 322 with its unsupercharged engines offered a top speed in excess of 400 mph at 17,000 feet - much faster than the North American NA-73 Mustang.

With the fall of France during early 1940, the RAF opted to pick up the remainder of the Model 322 contract. The first three P-322s were crated and shipped to England during 1942 for extensive tests at RAF Boscombe Down, the RAF's testing facility. RAF serial numbers reserved for the Lightning Is were AE 978-999 and AF 100-220.

In any event, the RAF decided that the Lightning did not meet their needs at the time and rejected the aircraft. It could have meant disaster for Lockheed to lose such a large contract; however, the U.S. Army Air Force took over the P-322s that remained on the contract for use as P-38 trainers and for use in the defense of the Continental United States. Although the first twenty-three P-322s were completed equipped with the C series Allison engines, the remaining 120 aircraft were built with Allison V-1710-F2 engines with opposite rotation propellers. These aircraft were designated as Lightning Mk IIs and later redesignated as P-38F-13, F-15, and G-15. A total of 524 Model 322s were built.

P-38-LO (Lockheed Model 122)

The first production version in the Lightning series was the P-38-LO (there was no P-38A), which Lockheed named the Atalanta. The P-38-LO was nearly identical to the service test YP-38s, with the exception that the production aircraft carried "combat equipment." This consisted of armor plate around several areas including the pilot's cockpit and a flat pane of armored glass which was mounted on the inside of the windscreen. The armament was changed to four .50 caliber machine guns, plus the 37MM cannon. Additionally, the very pointed spinners of the XP/YP-38 were changed to a spinner with a blunter tip, which was much easier to produce.

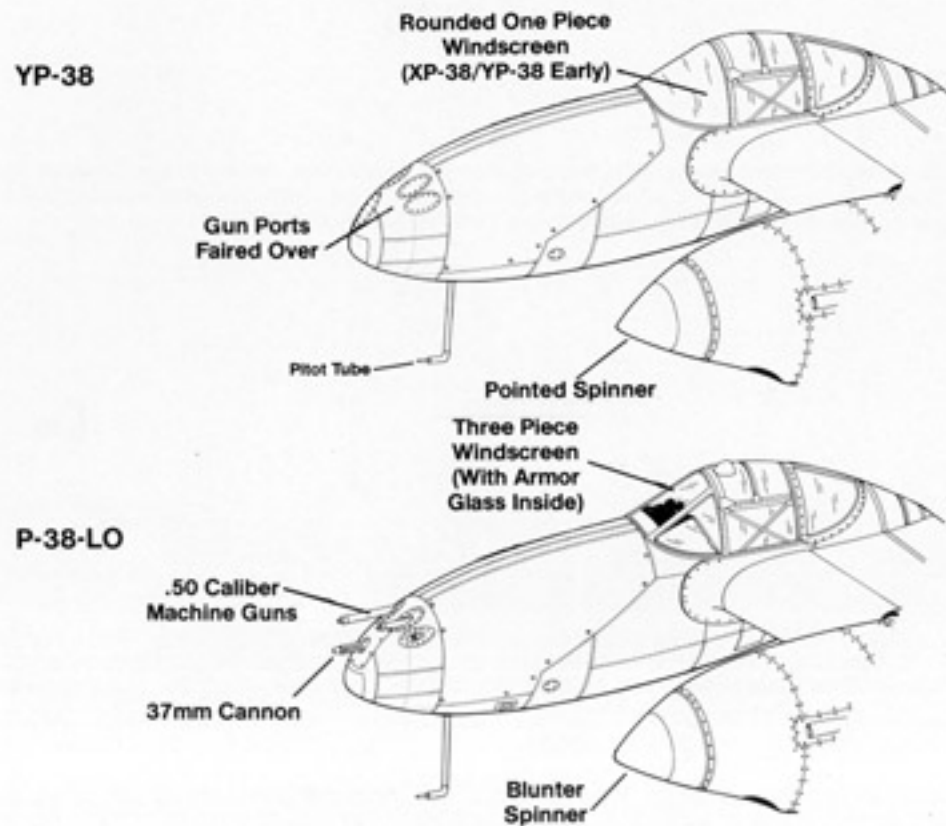
Twenty-nine P-38-LOs were built, with most of these being delivered to the 1st Pursuit Group at Selfridge Field, Michigan. It had been the pilots of the 1st PG that had flown the service tests of the YP-38 at Wright Field during the Spring of 1941 and therefore the 1st PG was selected to become the first operational unit to re-equip with P-38s. The P-38-LOs were later redesignated RP-38 (for Restricted Flight) and assigned to non-combat operations during 1942. These same RP-38s, however, would have been the first line of defense had the Japanese attacked the California coast during 1942.

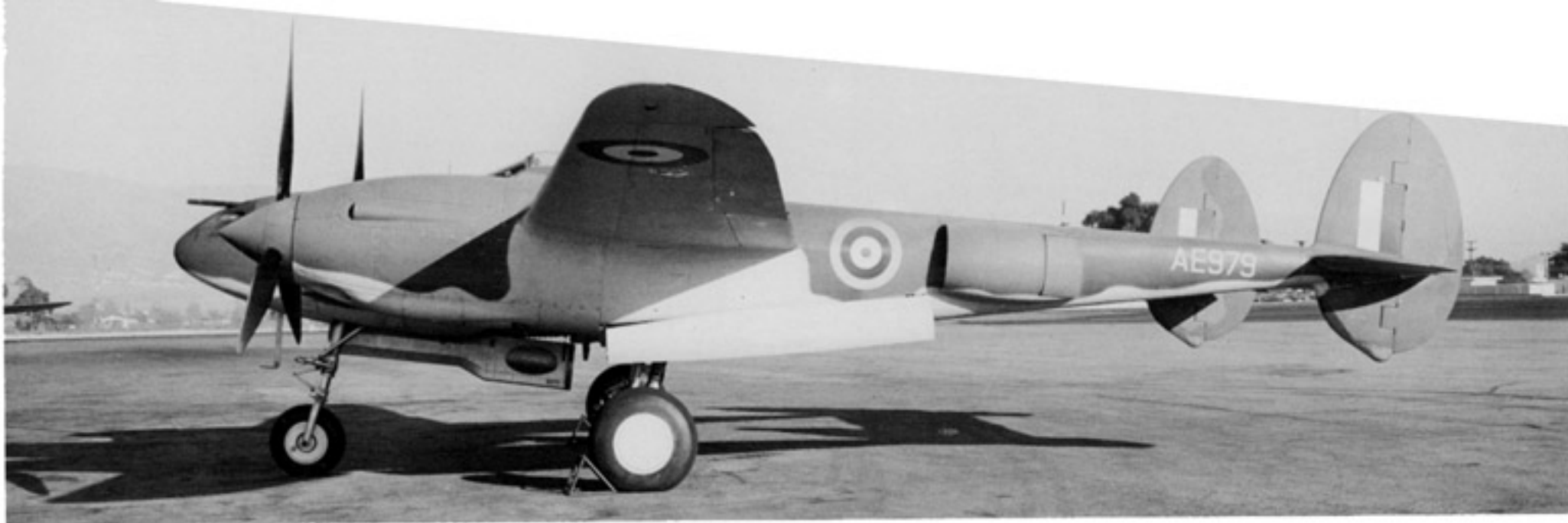
A P-38-LO Atalanta of the 1st PG at Selfridge Field, Michigan. The 1st PG was the first Army Air Force unit to become operational with the P-38. Lockheed built twenty-nine P-38-LOs (named the Atalanta by Lockheed), which were later redesignated as RP-38s (for Restricted Flight) during 1942. (Art Krieger)



The first production P-38-LO (40-744) conducts a test flight over California during mid-1941. The P-38-LO was identical to the YP-38 except for the installation of armament and a more blunted tip on the propeller spinner. These aircraft were delivered in Olive Drab over Neutral Gray camouflage. (AFM)

Fuselage Development





An early production P-322 Lightning I on the ramp at Lockheed's Burbank, California, facility. The cowling shape of the P-322 differed from all other P-38 variants. (Lockheed)

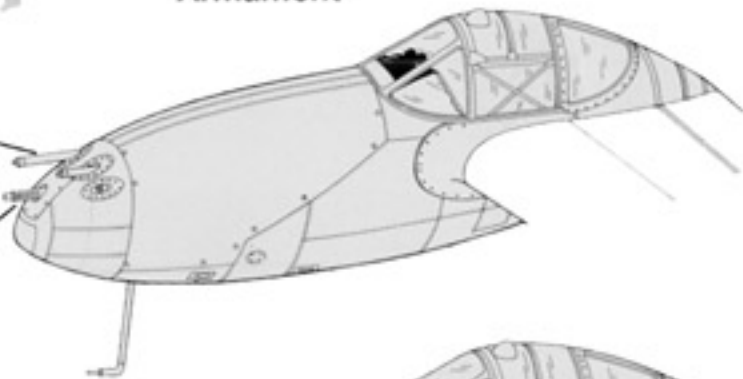
A Lightning I (AE 979) on a test flight over California. The carburetor intake scoop is visible on the boom above the wing. The two pipes exiting above the wing are the engine exhausts, unique to the Lightning I. The RAF camouflage was Dark Earth and Dark Green uppersurfaces over Sky undersurfaces. (Lockheed)

Armament

P-38-LO

Four .50 Caliber
Machine Guns

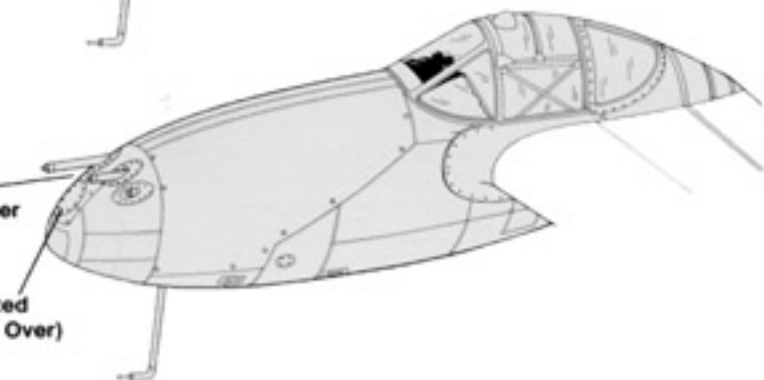
37mm Cannon



P-322 Lightning I

Two .50 Caliber
And Two .30 Caliber
Machine Guns

Cannon Deleted
(Gun Port Faired Over)





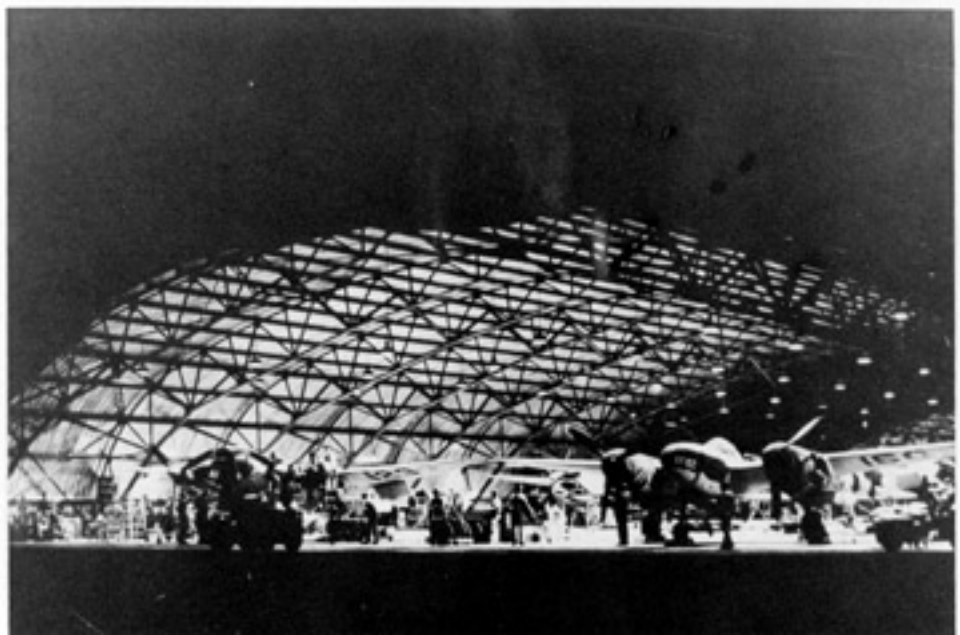
A P-322 Lightning sits on the compass test stand at the Lockheed Air Terminal, Burbank, to check for compass error. The Royal Air Force named the aircraft the Lightning and the USAAF adopted the name for the P-38. (Lockheed)

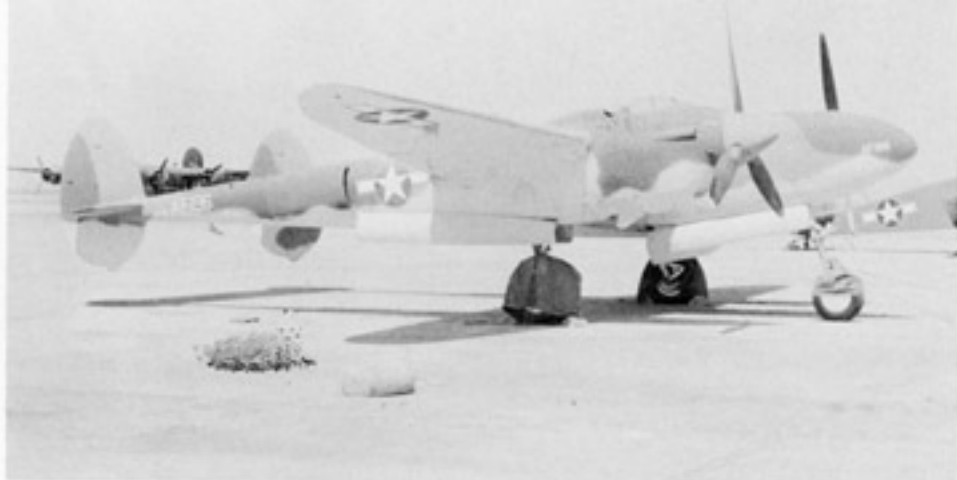
A USAAF P-322 on the ramp at Chanute Field during October of 1942. AE 992 was the fourteenth P-322 built and carries standard USAAF markings of the period — star in circle national insignia and US ARMY in Black under the wings. The aircraft retained the earlier RAF camouflage. (Art Krieger)



P-322 Lightnings undergo final assembly on the outdoor production line at Lockheed (the aircraft in the background are Hudson bombers). With the normally superb weather in Southern California, many aircraft were completed in outdoor assembly areas such as this one. (Lockheed)

These USAAF P-322 undergo maintenance in a well lit hangar at Williams Field during late 1942. The USAAF took over the entire production run of P-322s after the RAF rejected the aircraft. The P-322s were used as both trainers and to defend the West Coast aircraft plants. (SGT James Crow)





AF196 was a Lightning I used as a trainer in California during late 1943. P-322 Lightning Is were never assigned AAF serials and retained their RAF camouflage and serials throughout their service lives. By late 1943, all P-322s were relegated to the trainer role. (Fred Dickey via Ernie McDowell)



A number of P-322s were later modified with Allison F-series engines, revised cowlings and counter-rotating propellers. These aircraft, however, were still unsupercharged and retained the carburetor air scoop and engine exhausts above the wing. (Robert F. Dorr)

A P-322 Lightning Mk II equipped with one 300 gallon drop tank and a 2,000 pound torpedo. The Lightning II was equipped with standard supercharged Allison F-series engines and were designated as P-38F-13, F-15, and G-15 by the USAAF and were assigned AAF serials. (Lockheed)



The first Lightning II, AF221 (serial 43-2035), reveals the great load-carrying capability of the P-38 wing. The aircraft is configured with a pair of 2,000 pound Navy torpedos under each wing. For the test flights the torpedos were secured in place with steel cables. (Lockheed)



P-38D (Model 122)

The P-38D was the first production variant of the Lightning to be considered "combat capable," as specified by the War Department. It was this set of combat capability specifications that led the variant to be designated the P-38D, skipping the designations P-38A through P-38C. The specifications called for upgraded armor plate in the cockpit, armored glass behind the windscreen, self-sealing fuel tanks and a low pressure oxygen system. The installation of self-sealing fuel tanks decreased the internal tankage of the P-38D to 340 gallons.

Late production P-38Ds also had the wing fillets that were first installed on the British P-322. These wing fillets cured the tail flutter problem that had plagued all the previous P-38 variants. Lockheed built a total of thirty-six P-38Ds, with the first aircraft being accepted by the Army during July of 1941.

Two units are known to have received operational P-38Ds — the 1st Pursuit Group at Selfridge Field, Michigan, and the 14th Pursuit Group at Hamilton Field, California. On 20 June 1941, the Army Air Corps became the Army Air Force and with this change all former Pursuit Groups and Squadrons became Fighter Groups and Squadrons. It was the aircraft of the 1st FG that participated in the 1941 "war games" in the Carolinas and Louisiana. Both White and Red crosses were painted on the Lightnings depending on which "side" they were on at the time.

The 54th Fighter Squadron was equipped with a mixed bag of P-38Ds and Es when they deployed to Alaska during June of 1942 following the Japanese invasion of Attu and Kiska. The P-38 was the only USAAF fighter capable of reaching the Japanese bases from the U.S. base at Adak.

The first victory for a P-38 pilot over the Luftwaffe came on 14 August 1942 when LT Elza Shahan scored a number of hits on a German FW-200 bomber which exploded. At the time of his victory, LT Shahan was flying a P-38D of the 27th Fighter Squadron stationed in Iceland.

This P-38D of the 1st PG was assigned to the White Force, based at Goodfellow Field, Texas, for the Louisiana Maneuvers held during the Fall of 1941. The P-38D was the first "combat capable" version of the P-38. This aircraft has pointed propeller spinners, which were not normally found on P-38Ds. (W.L. Bannister)



White Force P-38Ds of the 1st PG parked on the ramp at Randolph Field, Texas during 1941. The P-38D had armored glass and self-sealing fuel tanks, both installed based on lessons learned by USAAC observers in Europe during the early war years. (Maurice Delay)

Thumper, a P-38D of the 20th Fighter Group at March Field, California during early 1943. The 20th FG would later become one of a few units to successfully operate the P-38 as an escort fighter with the 8th Air Force over Europe. (AFM)



P-38E (Model 222)

The P-38E was the first true combat variant of the Lightning, although several P-38Ds saw combat in the Alaskan campaign and over the North Atlantic. It was on the P-38E that the Hispano-Suiza 20mm cannon, license-built by Bendix as the M-1, was first introduced. Additionally, the P-38E was the first U.S. variant to have the nose wheel retraction linkage change that had been introduced on the Model P-322. The change allowed the ammunition supply for each of the four .50 caliber machine guns to be increased from 200 rounds per gun to 500 rounds per gun.

The P-38E also differed from earlier P-38s in that the upper engine nacelle air scoop was deleted. Toward the end of the P-38E production run, the three blade Hamilton Standard hollow steel propellers were replaced with Curtis Electric Dural solid blade propellers.

Lockheed built 210 P-38Es and the majority of the P-38s involved in the Aleutian campaign were P-38Es of the 54th FS. These were the first Lightning fighters to see combat. The first Lightnings in combat were F-4 Photo Lightnings of the 8th Photo Group based in Australia during April of 1942. The first P-38 victory of the Second World War is credited to LT Stan Long. On 4 August 1942, LT Long shot down a Japanese four-engine Mavis flying boat over Dutch Harbor in the Aleutian Islands.

Later, many P-38Es were sent to Lockheed rework facilities, such as the one at Langford Lodge, Northern Ireland, where they were re-engined and brought up to P-38G standards. Ninety-nine P-38E airframes were also converted into F-4 photographic reconnaissance aircraft.

One novel plan was based on the P-38E. This involved converting the P-38E into a floatplane for use against the Japanese from island bases. The aircraft was to be outfitted with dropable, fuel filled floats to allow it to be ferried out to island bases in the Pacific. In any event, the Battle of Midway changed the need for such an aircraft and the idea was shelved.

A Lockheed technician checks the ammunition feed chutes for the .50 caliber machine guns. The ammunition supply on the P-38E was increased from 200 rounds per gun (RPG) to 500 RPG, with 150 rounds being carried for the M1 20mm cannon. (Lockheed)



The P-38E was the first Lightning variant to be armed with the Bendix license-built Hispano-Suiza M1 20mm cannon, which was installed below the four .50 caliber machine guns in the nose. The side-opening canopy was common on early P-38s. (Lockheed)



A P-38E of the 14th FG rests in shallow water off Northern California during early 1942. The Red dot in the insignia center was later painted out to avoid any possibility of mistaking it for the Japanese insignia in the heat of battle. The 14th FG was based at Hamilton Field. (Robert F. Dorr)



Three P-38Es of the 82nd FG undergo servicing at Lockheed's Langford Lodge, Northern Ireland, facility. The aircraft are being readied by 8th AF Service Command personnel for delivery to combat units in North Africa. As with other aircraft operating in North Africa, the Lightnings have a Yellow surround added to the national insignia. (USAF via Jeff Ethell)

A P-38E of the 54th FS on the ramp at Vancouver, British Columbia while enroute to the Aleutian Islands during the Summer of 1942. The P-38Ds and Es of the 54th FS were the first Lightning fighters to see combat. The White band around the boom identifies this Lightning as a Flight Leader's aircraft. (SGT James Crow)

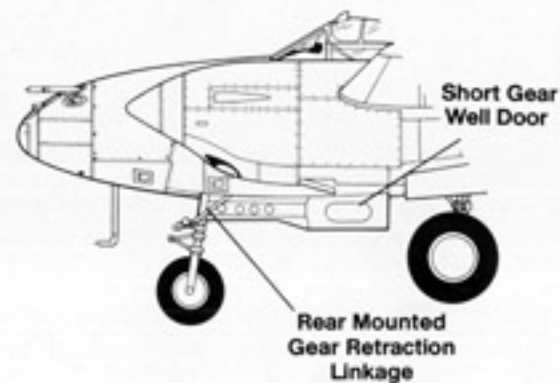


Nose Gear Development

P-38D



P-38E





P-38Es of the 54th Fighter Squadron on the ramp at Longview Airfield on Adak Island in the Aleutian Chain. It was in the Aleutian campaign that the P-38 first saw combat, with their first victory occurring on 4 August 1942. These aircraft all have had the Red dot in the insignia painted out. (AFM)

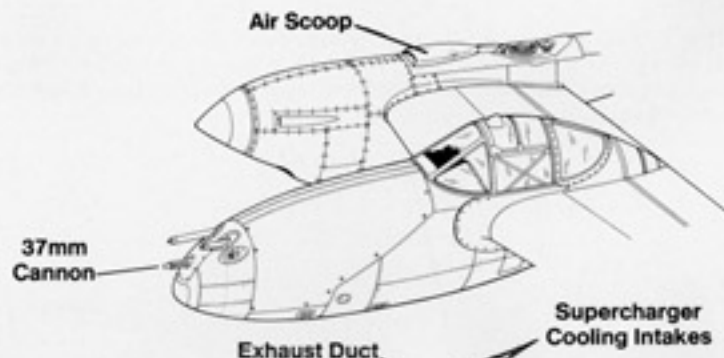
Conditions on Adak were harsh, even in the Summer. The P-38Ds and P-38Es of the 54th FS performed admirably in defending the Aleutian Islands against the Japanese at Kiska. Longview Airfield was constructed in a drained lagoon that, more often than not, was full of standing water and mud. (Lockheed)



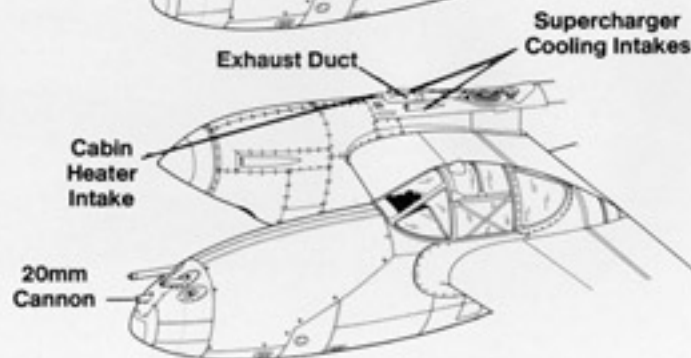
LT Stan Long climbs into the cockpit of his 54th FS P-38E at Longview Airfield on Adak. LT Long is credited with the first P-38 victory of the Second World War. On 4 August 1942 he shot down a Japanese Mavis four-engine seaplane patrol bomber. Even with the canopy open, it was a tight fit for the pilot, wearing a parachute, to get into a P-38. (Lockheed)

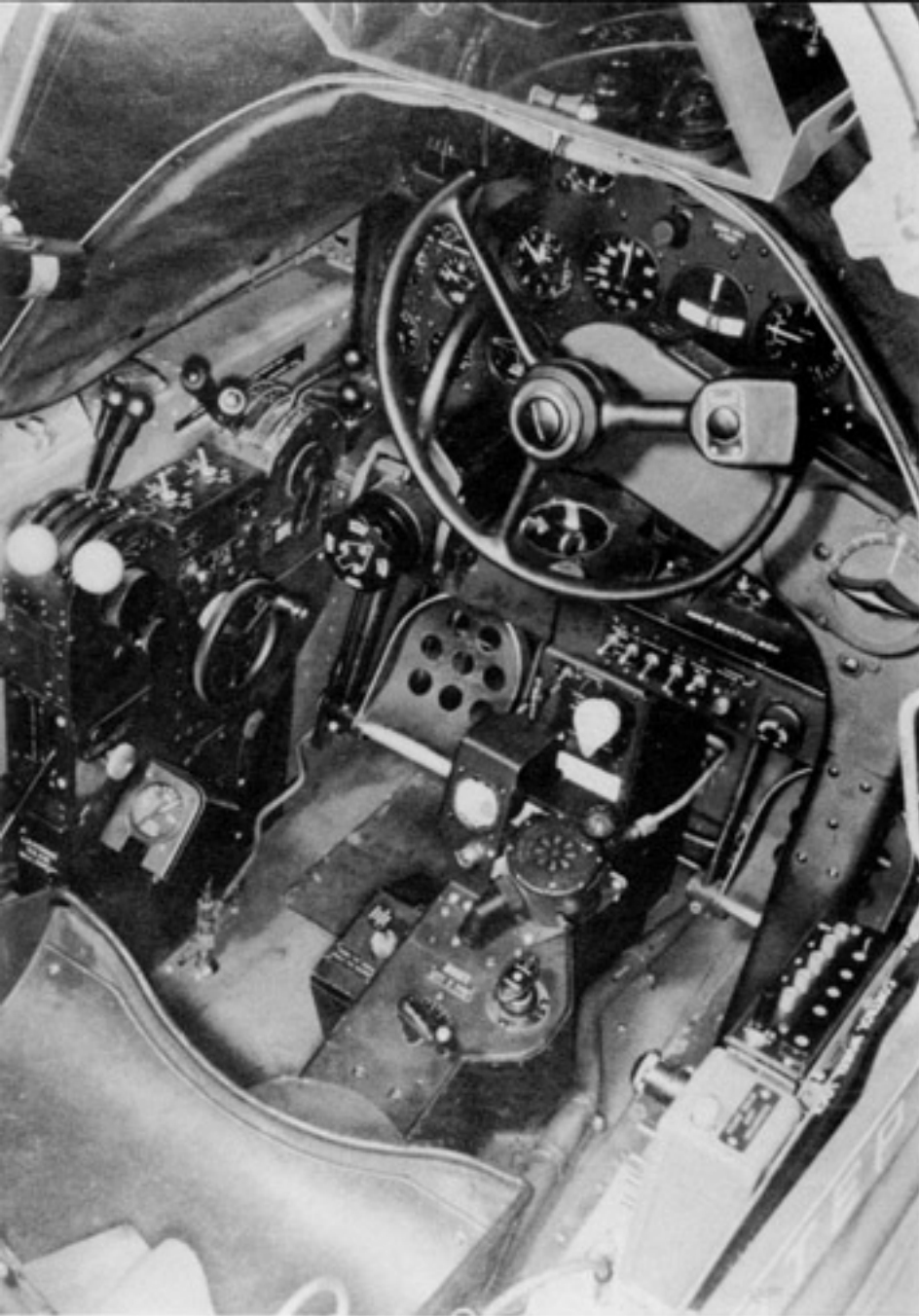
Armament/Supercharger Development

P-38D



P-38E



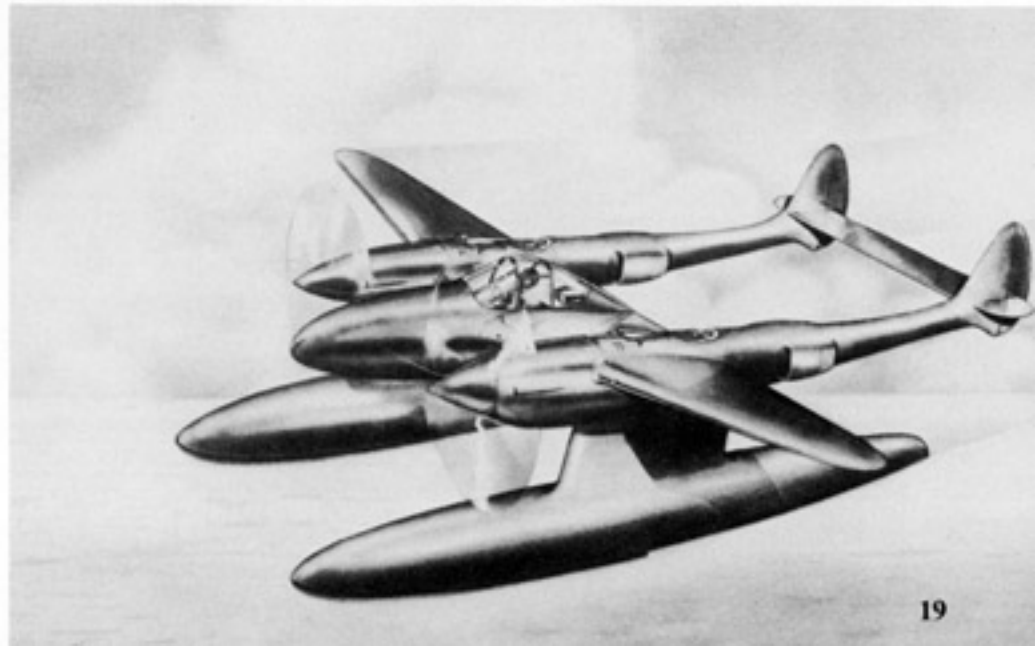


The cockpit of the P-38E was painted AAF Interior Green (FS 34151) with a Black instrument panel and Black control boxes. The P-38 was also different from conventional USAAF fighters in that it used a control wheel instead of the more traditional control stick. (AFM)



A pair of 54th FS P-38Es fly escort for a 36th BS B-17 on a mission against targets on Japanese-held Kiska Island in the southern Aleutian Islands. It was not unusual for bombing missions to be flown by a single B-17 or B-24 with a pair of P-38s acting as escort. (Lockheed)

An artist's conception of the proposed P-38 float plane fighter. The P-38 float plane used a P-38E airframe with upswept and extended booms. The large floats were dropable and the aircraft retained its landing gear for land operations. The Battle of Midway cancelled the need for such an aircraft and the project was abandoned. (Lockheed)



P-38F (Model 222)

The P-38F differed from the P-38E in two major areas - its engines and fuel capacity. With the maximum weight now at over 19,000 pounds, Lockheed felt it necessary to increase the power of the Lightning by installing 1,225 hp Allison V-1710-49/53 engines. The decreased internal fuel supply, in addition to more powerful engines, also led Lockheed to develop an underwing pylon capable of carrying ordnance or fuel tanks.

The wing center section was stressed so that the P-38F could carry two of these pylons each capable of carrying a 165 gallon drop tank, or a 1,000 pound bomb. One P-38F, actually one of the re-possessed Lightning IIs, was used to test the Lightning's capability as a torpedo bomber. The aircraft was modified to carry two 1,900 pound aerial torpedos under the wings.

The first drop tanks were designed specifically for the P-38 by Kelly Johnson. Combat range was the critical area (combat range was the range to and from the target area, plus takeoff and landing and at least twenty minutes of combat time over the target area). Combat range with the 165 gallon drop tanks installed was approximately 1,000 miles. The increased range capability was further demonstrated during August of 1942 when Lockheed test pilot Milo Burcham cruised over 3,000 miles using specially designed 300 gallon drop tanks.

Another change to the P-38F was in the manner in which the canopy opened. The earlier side-opening canopy top section was replaced with a rear hinged, upward-opening canopy top section (although a number of early production P-38Fs came off the production line equipped with the side-opening canopy). The P-38F also used the "combat flap" which was introduced on the block -15 aircraft. The "combat flap" was simply a modification to the flap actuator that allowed the flaps to be deployed to a maximum of 8 degrees at combat speeds. The use of the "combat flap" increased the lift and made the aircraft more maneuverable. The P-38F also had the pitot tube relocated from under the nose to a position under the port wing.

It was a P-38F that was converted into the first two-seat cockpit. This modification was a piggy-back arrangement, with both pilots very cramped under a standard P-38F canopy. The second pilot occupied the space normally used for the radio gear mounted behind the pilot. Several were built as trainers and several others were converted by field units as utility aircraft. Production of the P-38F totaled some 547 aircraft, of which twenty were converted to photo recon aircraft. 50 aircraft (designated P-38F-13 and F-15) were ex-RAF Lightning IIs with RAF serials running between AF 221-744.

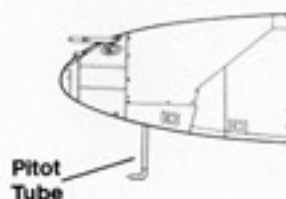
P-38Fs of the 14th Fighter Group are parked in sandbag revetments at Keflavik, Iceland during July of 1942. P-38s were based on Iceland to protect the northern ferry route to England. (USAF via Jeff Ethell)



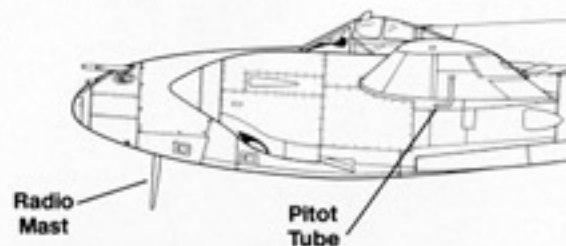
A flight of four 20th Fighter Group P-38Fs cross over the runway at March Field following a training mission over the Pacific. The aircraft carry typical ZI markings of a plane in group number and single letter on the boom in Yellow. Although operating in a training role, the 20th FG was also charged with the defense of Southern California. (Lockheed)

Pitot Tube

P-38E



P-38F



A P-38F of the 1st FG is towed by a small tractor at Youks les Bains, North Africa, during December of 1942. A number of early production P-38Fs retained the side-hinged canopy of earlier P-38 variants. (US Army via Jeff Ethell)





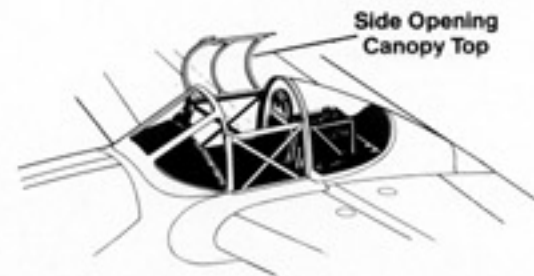
The concentrated firepower of the P-38s four .50 caliber machine guns is demonstrated during a night bore-sighting test. All four machine guns and the 20mm cannon were bore-sighted to fire straight ahead. This is a late P-38F with the rearward opening canopy. (Lockheed)



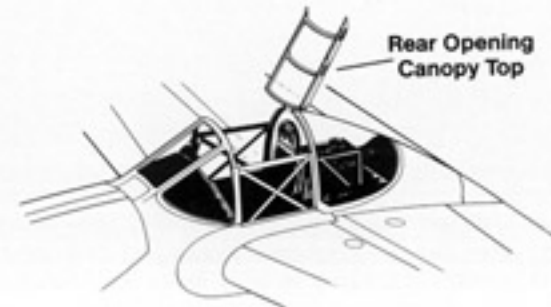
The P-38F differed from the P-38E in having 1,225 hp Allison V-1710-49/53 engines and strengthened wing center sections capable of carrying pylons for either 165 gallon drop tanks or up to 1,000 pound bombs. (Lockheed)

Canopy Development

XP-38 Through
P-38F (Early)



P-38F
(Late)





British lorries tow six P-38Fs through the Liverpool fog from Garston Docks to Lockheed's British Reassembly Division at Speke Airport. Although the P-38F could fly across the Atlantic, most aircraft were sent to England on cargo ships. (Lockheed)



This P-38F, on the snow covered ramp at Camp Tripoli, Iceland during November 1942, was the personal aircraft of the 50th Fighter Squadron Commanding Officer. P-38Fs of the 1st FG made the first Atlantic crossing by a fighter unit during Operation BOLERO in June of 1942. (Lockheed)

Ground crew service this P-38F of the 96th FS while its pilot, LT Lawrence Liebers, confers with his crew chief, TSGT Roswell Harding. On one mission, Liebers shot down three Italian MC-202s and damaged two others. Later, he brought his score up to five confirmed kills. (USAF via Jeff Ethell)





Nulli Secundis was the name of one of Kenn Ladd's P-38F Lightnings. The aircraft carries eight Japanese victory flags on the nose. Ladd flew this P-38F with the 80th FS/8th FG at Dobodura, New Guinea, during October of 1943. (SGT James Crow)



WALLY, a P-38F of the 48th FS, was flown by the unit's Commanding Officer during late 1942. At the time, the unit was attached to the 14th FG, based at Youks-Les-Bains, Algeria. The P-38F differed from the P-38E in having the pitot tube moved from under the nose to under the port wing. The propeller spinners and bands on the boom are in Red. (AFM)

This P-38F on the Lockheed ramp was experimentally fitted with two 300 gallon drop tanks and four sets of three tube 4.5 inch bazooka rocket launchers. Although this combination was successfully tested, only the fuselage bazooka mounts were used operationally. (Lockheed)



A P-38F of the 431st FS/475th FG at 12 Mile Strip, Port Moresby, New Guinea. GEN George Kenney, commander of the 5th Air Force, viewed the 475th FG as his "personal" fighter group. The group totaled 540 victories between May of 1943 and the end of the war. (Vincent Straus)





Japanese Sandman II was the P-38F flown by LT Richard Smith of the 39th FS/35th FG at Henderson Field on Guadalcanal. Smith scored seven victories with the 39th FS. The markings included a Red and White sharkmouth, Blue spinners and White numbers (squadron numbers ran between 10 and 39). (Art Krieger)

This rare overall natural metal P-38F-15 (ex-RAF Lightning II) carries one Italian kill marking, four German kill markings and eleven bombing mission symbols on the nose in Black. The aircraft's unit, pilot and location are all unknown. (Art Krieger)



A Cietrac tow tractor pulls a P-38F of the 82nd FG/12th AF away from the wooden wheel stops on the compass check stand at Telergma Air Field, Algeria. The Lightning is carrying a single drop tank. The small bright area on the nacelle is a patch of polished metal used like a mirror to check the nose wheel position. (USAF via Jeff Ethell)

This 1st FG P-38F made an emergency landing in December of 1942 at Portela de Sacavem Airport in Lisbon, Portugal, and was the only P-38 to be interned in Portugal. In any event, the aircraft was rarely used, usually only when a visiting General was on the base. (Hans-Heiri Stapfer)



P-38G/H (Model 222)

The P-38G was externally identical to the P-38F. Internally it differed in that it was powered by a pair of Allison V-1710-51/55 engines with improved engine controls and had a low pressure oxygen system. The P-38G was stressed to carry the 300 gallon drop tanks as well as the earlier 165 gallon tanks. With the 300 gallon tanks, range increased to 2,050 miles (ferry range 2,300 miles).

Production of the P-38G totaled 1,462 aircraft, which included 180 photo recon aircraft conversions and 375 P-38G-15s, which were ex-RAF Lightning IIs.

P-38H (Model 222)

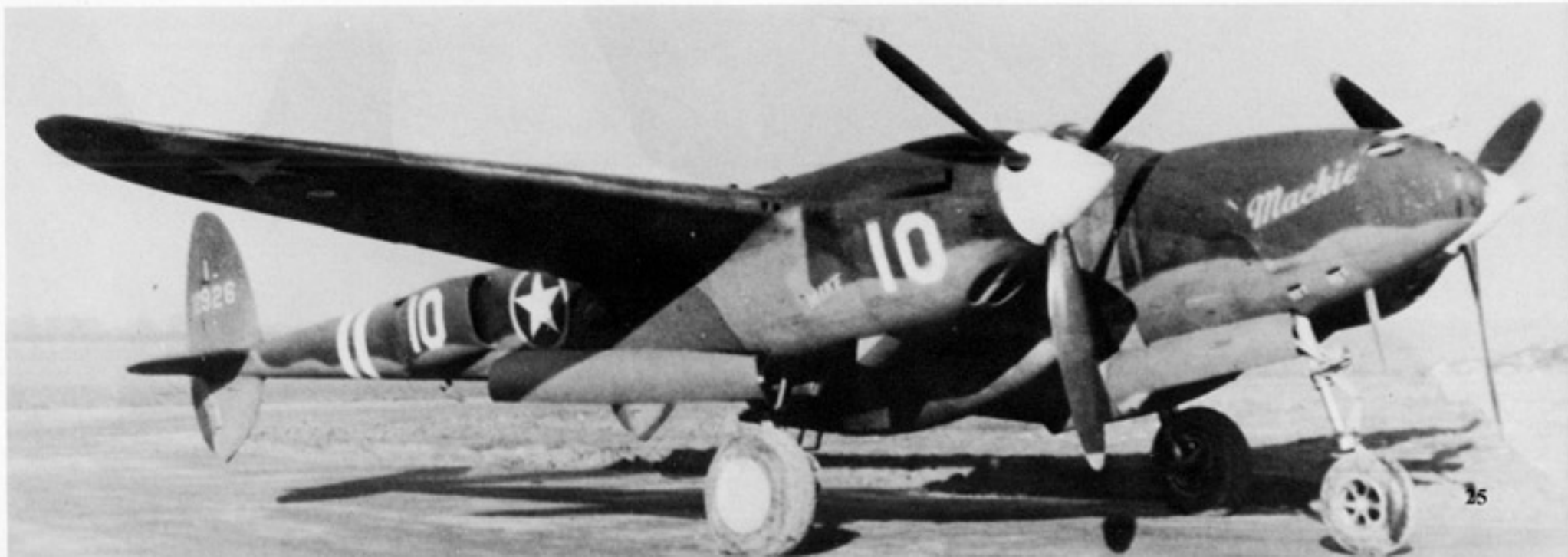
The P-38H differed from the P-38G in power plants installed. The P-38H was powered by 1,425 hp Allison V-1710-89/91 engines with fully automatic supercharger and oil cooler controls. Although the engine had a rated horsepower of 1,425 hp, it was restricted to 1,240 hp because of the inadequate intercoolers in the wing leading edge. Maximum weight of the P-38H rose to 19,900 pounds, reducing combat range (with 300 gallon tanks) to 1,950 miles.

The P-38H also had the early M1 20MM cannon replaced with an improved AN/M2C 20MM cannon. Production of the P-38H totaled 601 aircraft, of which 200 were converted for the photo reconnaissance role.

Mackie was a P-38G flown by CAPT Harry Dayhuff when he was Commanding Officer of the 82nd FS/78th FG at Goxhill, England during 1942. The 78th FG sent their P-38s to North Africa during early 1943 when they transitioned to the Republic P-47 Thunderbolt. (COL Harry Dayhuff)



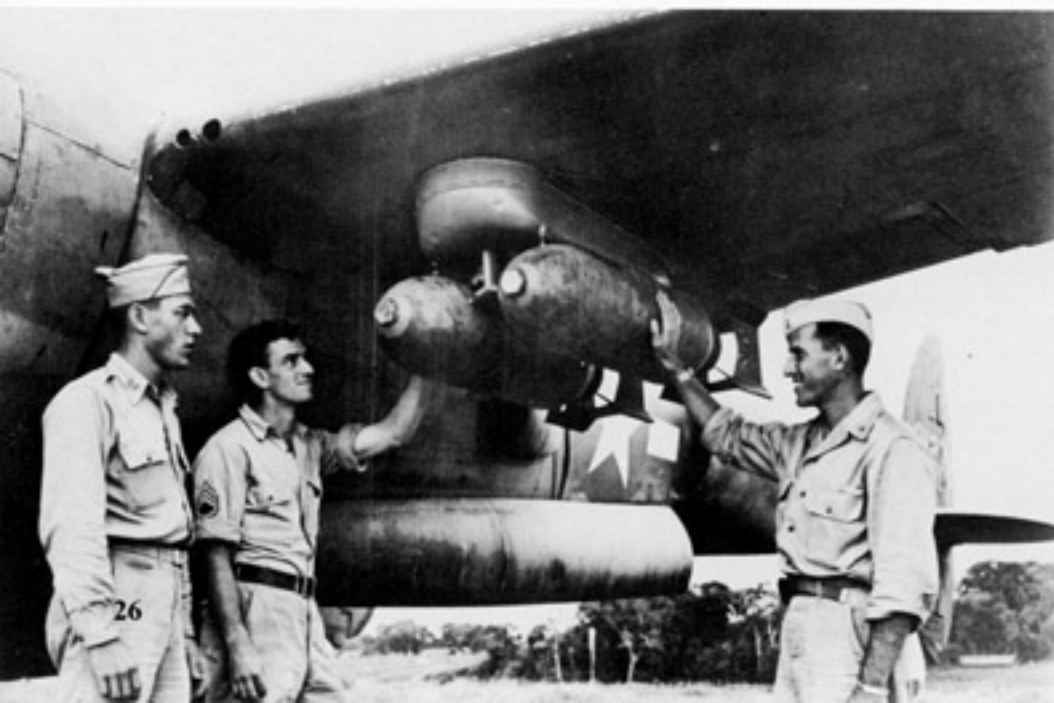
This P-38G is armed with 100 pound practice bombs at a training base in Florida during late 1943. The P-38G was externally identical to the P-38F differing only in the power plants with improved engine controls. (USAF)





A U.S. Navy escort carrier prepares to leave San Francisco for the South Pacific with a deck load of P-38s. Most fighter aircraft deliveries were done by cargo ship or aircraft carrier, even though many fighter types had sufficient range to ferry them by air. (Lockheed)

This experimental underwing bomb rack, capable of holding two 250 pound bombs, was successfully tested by the 82nd Fighter Group in the Pacific. The strengthened wing of the P-38G made such loads possible. (Lockheed)



Nose wheel strut collapse was a common accident among P-38 units. This P-38G of the 82nd FG was based at Pelergma, Algeria. Although most North Africa based aircraft carried the Yellow surround insignia, this P-38 had an unbordered insignia.

LT George Prentice flew this P-38G when he was assigned to the 432nd FS/475th FG at Dobodura, New Guinea, during 1943. The spinners and tail tips are Yellow with White trim, while the numbers on the nose and tail are in White with a Yellow border. (Jeff Ethell)





This P-38H is armed with a pair of 500 pound bombs under the wing center section. The aircraft was assigned to Orlando, Florida and used to develop tactics for the P-38. With its strengthened wing and additional power, the P-38H could carry a bomb load equal to a B-17 bomber. (USAF)



Lockheed pilot Jimmie Mattern conducts a test flight of a new production P-38H with one propeller feathered. The P-38H was powered by a 1,425 hp Allison engine instead of the 1,225 hp Allison used in the P-38G. (Lockheed)

A number of P-38s were marked as "fighting memorials" to former Lockheed employees that had been killed in action. This aircraft was marked in memory of John Wesley Starr, a riveter with Lockheed from July of 1940 to March of 1942. (Lockheed)

Armorerers service the ammunition feeds and clean the gun barrels of this P-38H of the 71st FS/1st FG at Vincenzo Airfield, Italy during early 1944. The nose, spinners, wingtips, tail number and color band are White. (Jeff Ethell)





Texas Ranger was the P-38H flown by LTCOL Jack Jenkins of the 38th Fighter Squadron, 55th Fighter Group at Nuthampstead, England. LTCOL Jenkins served as Group Commander of the 55th from June through October of 1944. (AFM)



LT J. Hagenback flew *BAT OUT OF HELL*, with its gargoyle-like face and sharkmouth, while assigned to the 94th FS/1st FG at Sardinia during early 1944. The Light Gray exhaust stains have obscured the serial number on the tail. The spinners are Yellow, while all other markings are in White. (Jeff Ethell)

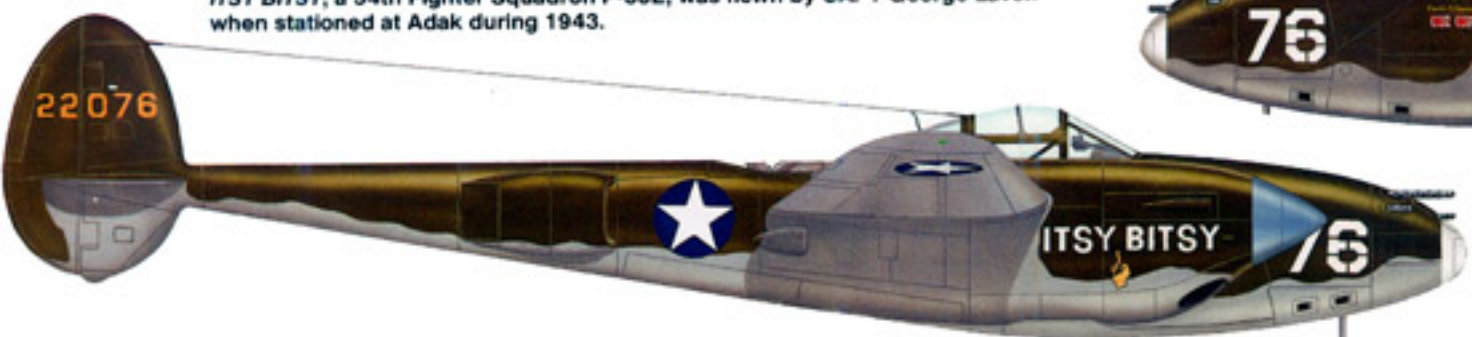
This P-38H was named *Stardust* and was flown by LT Royal Frey of the 55th FS/20th FG at Kings Cliffe, England. The 20th FG was the second of two groups in the 8th AF to operate the P-38. LT Frey later became the Curator of the Air Force Museum at Wright-Patterson AFB, near Dayton, Ohio. (Art Krieger)

A P-38H of the 338th FS/55th FG takes off from Nuthampstead, England during 1943. The P-38 was the first operational fighter aircraft in the history of the USAAF to be equipped with a tricycle landing gear. (Lockheed)



(Kill marks port side only)

ITSY BITSY, a 54th Fighter Squadron P-38E, was flown by CAPT George Laven when stationed at Adak during 1943.



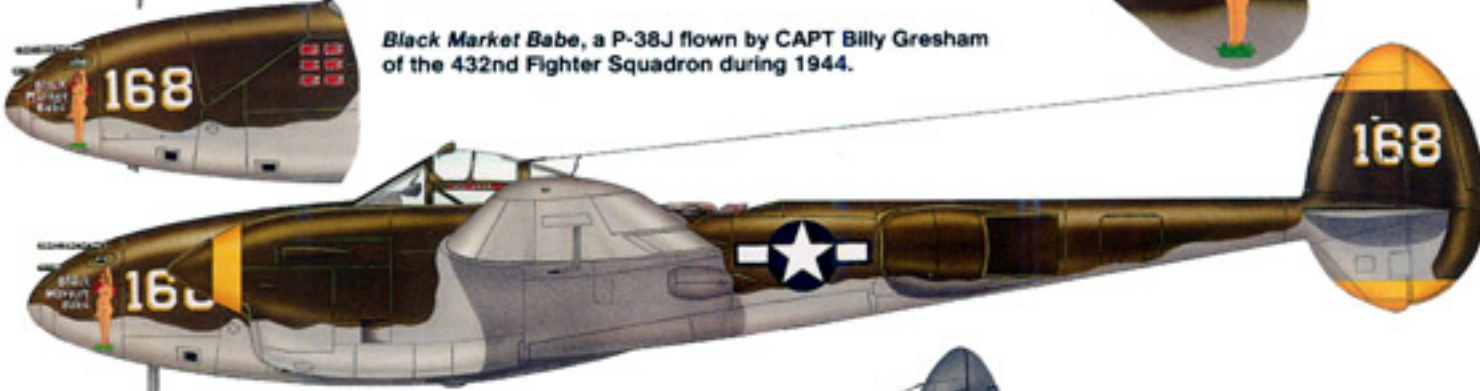
This P-38E, named *HAPPY JACK'S GO BUGGY/TEXAS TERROR* was flown by LT Jack Ilfrey of the 94th FS in North Africa during November of 1942.



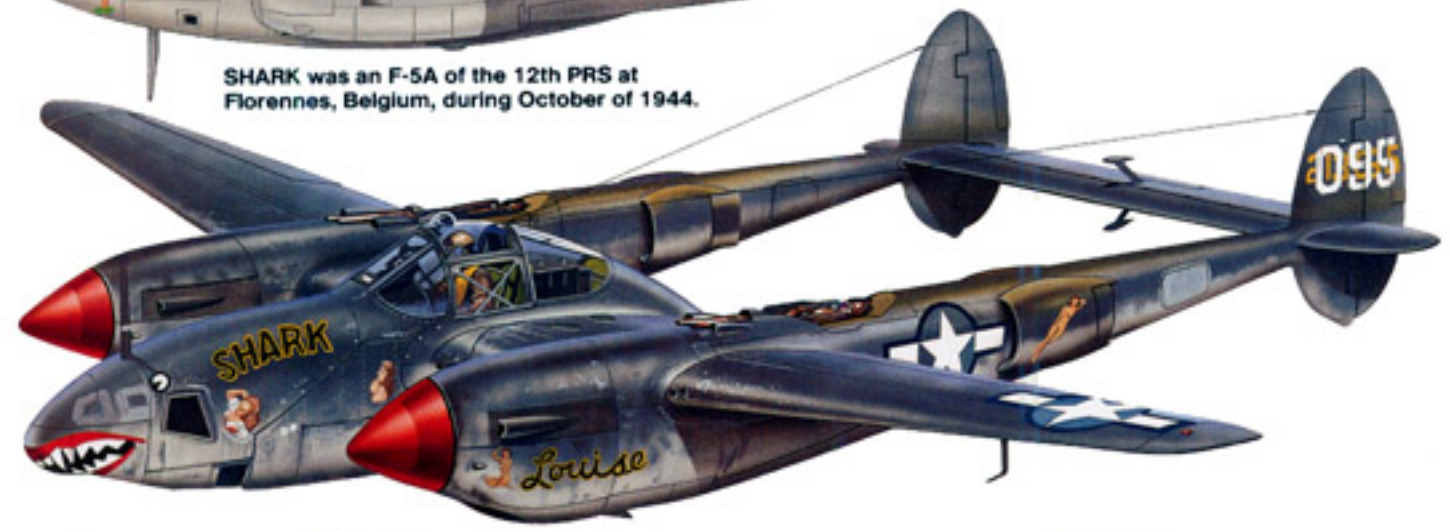
Texas Ranger was the P-38H Lightning flown by LTCOL Jack Jenkins of the 38th FS during late 1943.



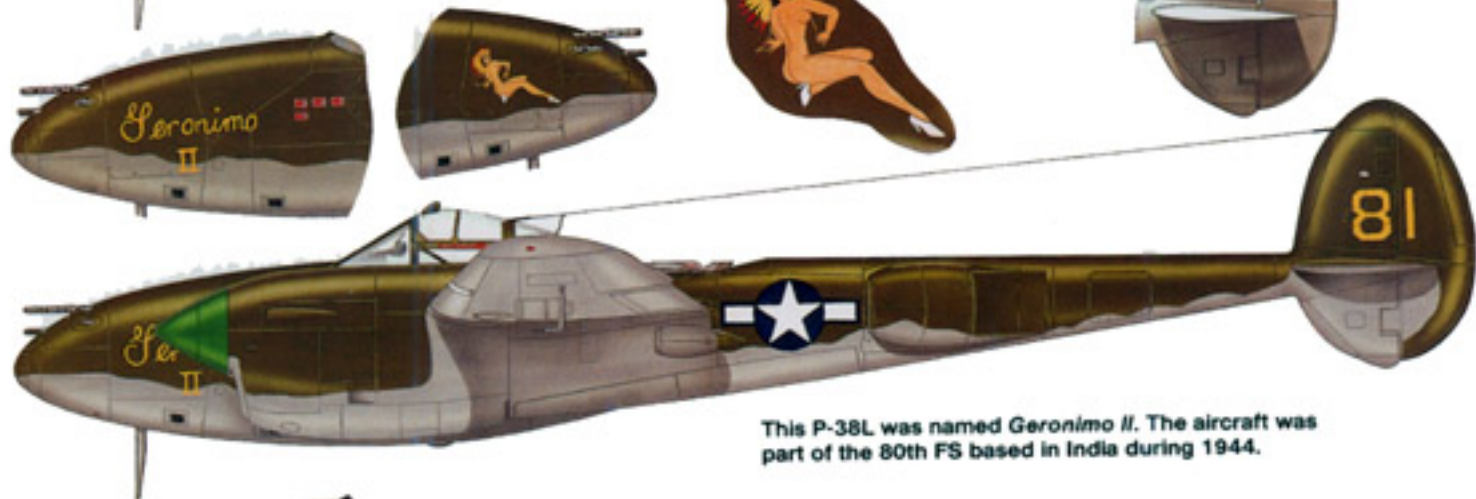
Black Market Babe, a P-38J flown by CAPT Billy Gresham of the 432nd Fighter Squadron during 1944.



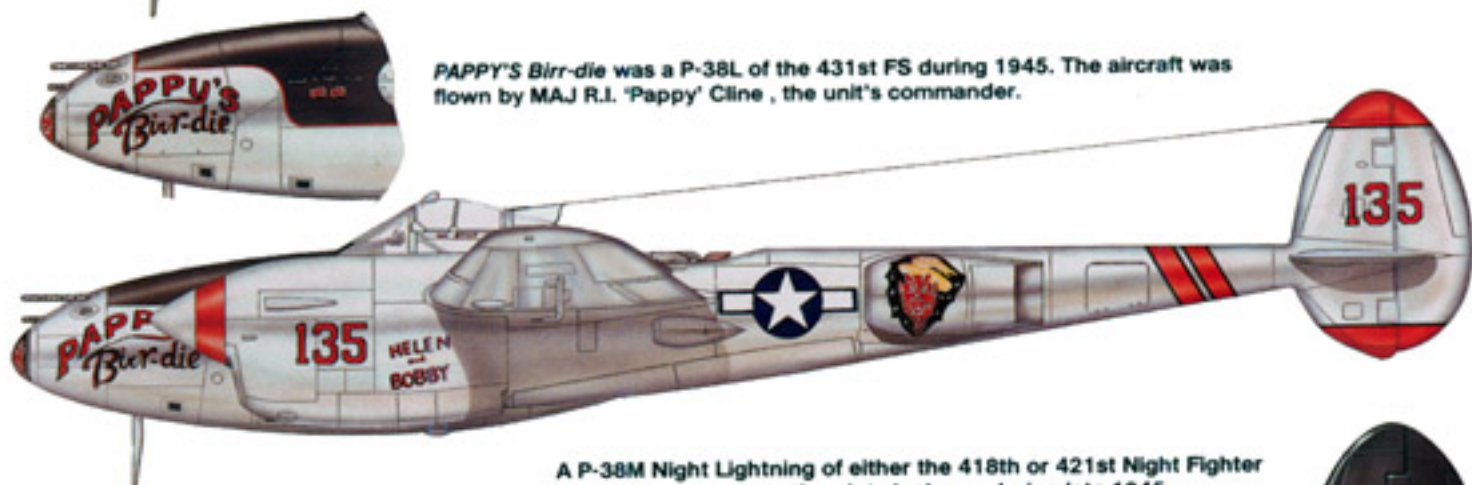
SHARK was an F-5A of the 12th PRS at Florennes, Belgium, during October of 1944.



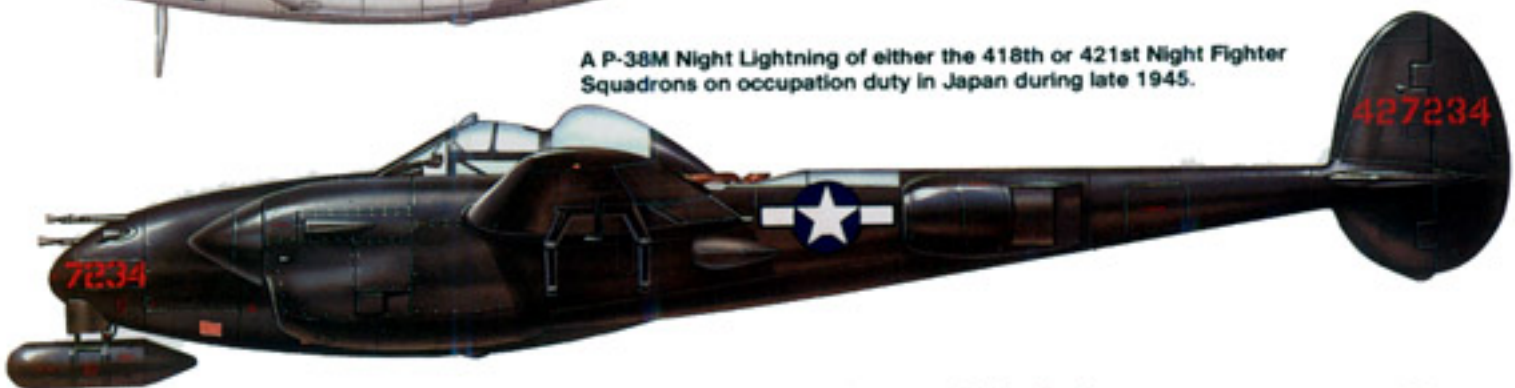
Les Vin, Les Femmes, et Les Chansons (Wine, Women and Song), a P-38J-25 flown by MAJ Sabo of the 485th FS at Florennes during the Fall of 1944.



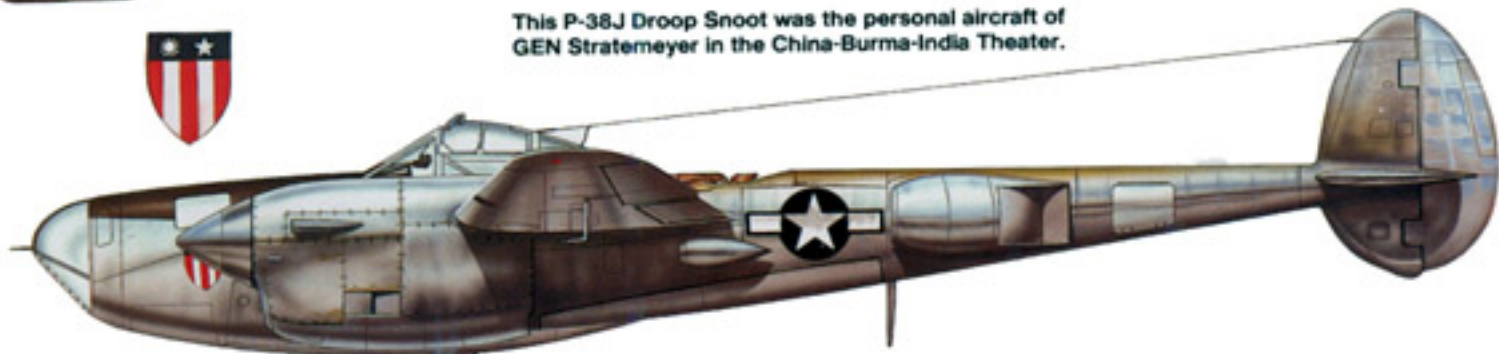
This P-38L was named *Geronimo II*. The aircraft was part of the 80th FS based in India during 1944.



PAPPY'S Bier-die was a P-38L of the 431st FS during 1945. The aircraft was flown by MAJ R.I. 'Pappy' Cline, the unit's commander.



A P-38M Night Lightning of either the 418th or 421st Night Fighter Squadrons on occupation duty in Japan during late 1945.



This P-38J Droop Snoot was the personal aircraft of GEN Stratemeyer in the China-Burma-India Theater.

P-38J (Model 422)

With the P-38J, the Lightning would finally fulfill all the expectations that Kelly Johnson and the Army Air Force had envisioned for the aircraft. It was the late production P-38J that became the ultimate Lightning with great speed, power, altitude, maneuverability and reliability. Not counting the reconnaissance variants, Lockheed built 2,970 P-38Js.

The P-38J differed from the earlier Lightning variants in having the turbo-supercharger intercoolers moved from inside the wing leading edge and replaced by a more efficient core-type intercooler mounted in a chin housing under the propellers. This allowed much greater control over the superchargers, making the Allison V-1710-F17 engine more reliable.

The radiator housings were completely redesigned becoming both larger and more aerodynamic in shape. These two changes finally gave the P-38 pilot the full use of the power available to him from each Allison — a total of 1,425 hp at 26,000 feet.

In the extra space in the wing leading edge, Lockheed fitted a 62 gallon fuel tank, although not all P-38Js had these leading edge tanks. Those that did were marked with a cross on the fuselage beside the aircraft's data block.

Beginning with the P-38J-10, the windscreen was changed from the rounded style (with an internal armor glass plate) to an external flat armored glass three-piece windscreen. Other cockpit changes included a new control column with a dual hand grip "half-wheel" in place of the earlier automobile-type control wheel, improved heating and defrosting equipment and electrical system improvements (fuses being replaced by circuit breakers).

The flight controls were modified in two stages, each of which made the P-38J more maneuverable and controllable. First, hydraulic boosters were added to the aileron control system, greatly increasing the roll rate of the P-38J over earlier Lightnings. With the "combat flaps" and hydraulically-boosted aileron controls, the P-38J could maneuver with (but not out-manuever) the best single engine Second World War fighters.

The second stage of flight control modifications was the installation of the so-called "dive flaps" under the wing. Kelly Johnson always referred to them as "compressibility flaps." From the very beginning of the P-38 program, the Lightning had been involved with a hazardous problem known as compressibility. With the great speed that a P-38 could build in a dive, it was quite possible, in fact probable, that the wing would suffer a high speed stall and lose lift.

When you lose lift, you lose controllability and the P-38 then became a streamlined rock! Several aircraft had been lost when the pilots lost control through compressibility and did not have enough altitude to recover. The Army finally put out several circulars restricting the dive speeds on P-38s. Worse, however, was the fact that German fighter pilots quickly learned of the compressibility problems of the P-38 and used it to their advantage. The Germans would simply dive away from the P-38 hoping the Lightning pilot would attempt to follow. If he did, the German pilot merely waited for the P-38 to gain enough speed for compressibility to take effect, then pull up and laugh as the P-38 pilot would frantically, but in vain, try to follow the German maneuver.

Kelly Johnson knew what the problem was and how he would go about solving it, but he had to battle the Army and NACA to prove it. Army and NACA kept referring to the problem as "tail flutter." Johnson was finally able to convince them that the problem was with wing lift, not in the elevator/rudder controls. Johnson's answer was to add a set of additional "flaps" installed on the underside of the outer wing panel. These flaps had only two positions, either fully retracted or fully deployed.

Although the prototype version was hydraulically actuated, production versions were electrically operated. Either immediately before entering a dive, or immediately after starting the dive, the P-38 pilot pushed the "dive recovery flap" button located on the control wheel. A small electric motor would rapidly extend a small two-piece flap into the airstream under each wing. These did not act as an air brake; they merely restored lift that was being lost to the effects of compressibility. The "dive recovery flaps" were introduced beginning with the P-38J-25. All subsequent models, including reconnaissance variants, had them as standard equipment. Additionally, during the block -25 production run, the landing light was moved from under the port outer wing to the leading edge of the port outer wing.



MAJ Richard I. Bong was the top scoring American Ace of the Second World War with forty confirmed victories. MAJ Bong flew a number of P-38s including this P-38J, which he used during a War Bond tour after his return to the U.S. during 1945. (Lockheed)

The P-38J would become the ultimate Lightning with both increased reliability and performance. The P-38J had the supercharger oil coolers and intercooler moved from the wing leading edge to radiators mounted in chin fairings under the propellers. (Lockheed)





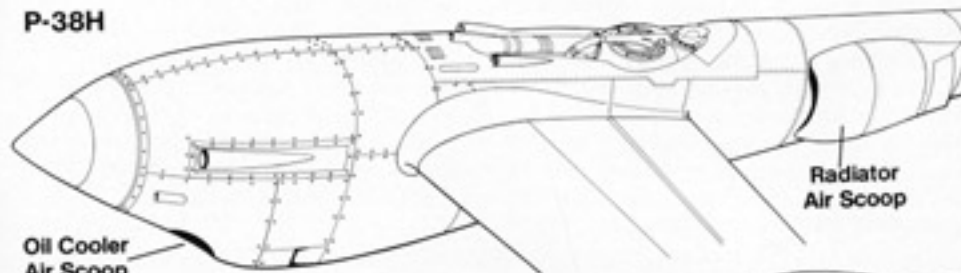
Lockheed Test Pilot Milo Burcham on the wing center section of a new production P-38J. The installation of the oil intercooler in the chin fairing allowed the space within the wing leading edge to be used for fuel. The polished oval panel on the inside of the engine nacelle allowed the pilot to visually check the nose gear position. (Lockheed)



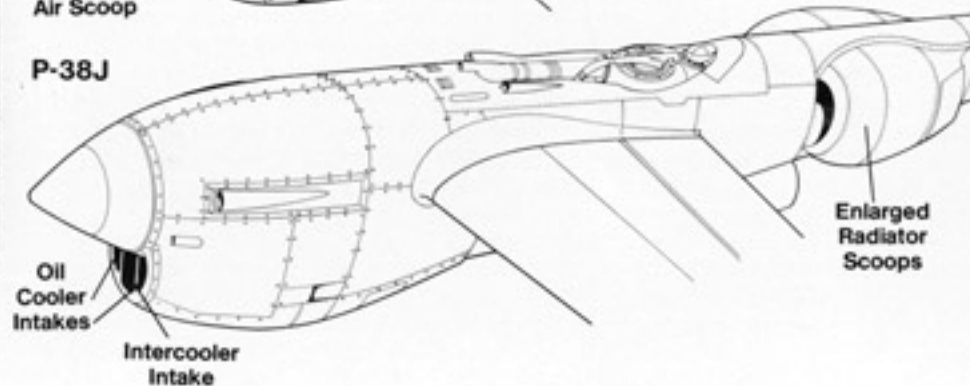
A new production P-38J-10 on the Lockheed ramp at Burbank, California during 1944. The P-38J-10 first introduced the flat-panel armored windscreen. The radiator housings on the rear portion of the boom were also redesigned being larger and more streamlined. The aircraft in the background is a TWA Lockheed 049 Constellation undergoing taxi trials. (Lockheed)

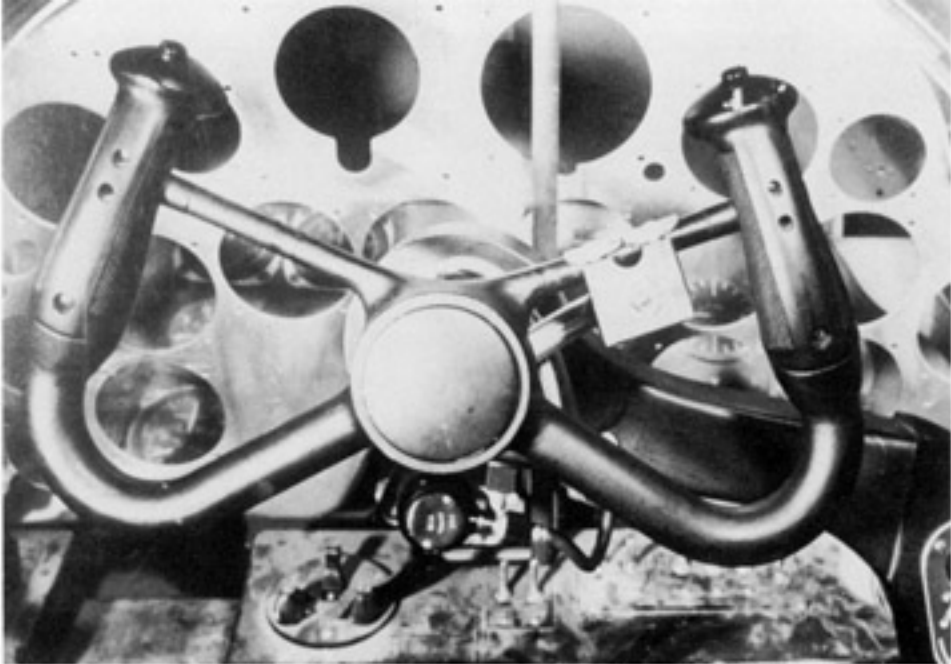
Boom Development

P-38H



P-38J





The P-38J-5 featured a redesigned control wheel that consisted of a dual-grip half-wheel. This wheel replaced the earlier automobile type wheel used in earlier Lightning variants. (AFM)

Stinger was an Olive Drab over Neutral Gray P-38J of the 338th FS/55th FG based at Nuthampstead, England. The Olive Drab camouflage gave way to natural metal finishes as the Allies won air superiority over Europe during the Spring of 1944. (Fred Dickey via Ernie McDowell)

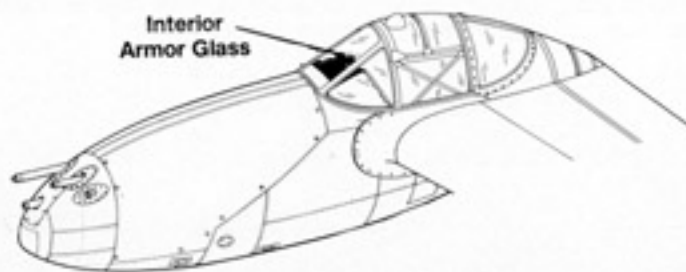


Miss V, a P-38J flown by MAJ Walter Duke while attached to the 459th FS/80th FG in India. MAJ Duke was credited with ten victories before being killed in action on 6 June 1944. The Dragon on the boom was Bright Green with Yellow trim and had a Red mouth with a Bright Green tongue. (SGT James Crow)

Canopy Development

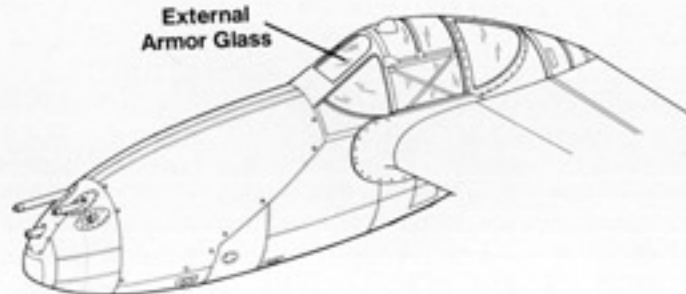
P-38H

Interior
Armor Glass



P-38J-10

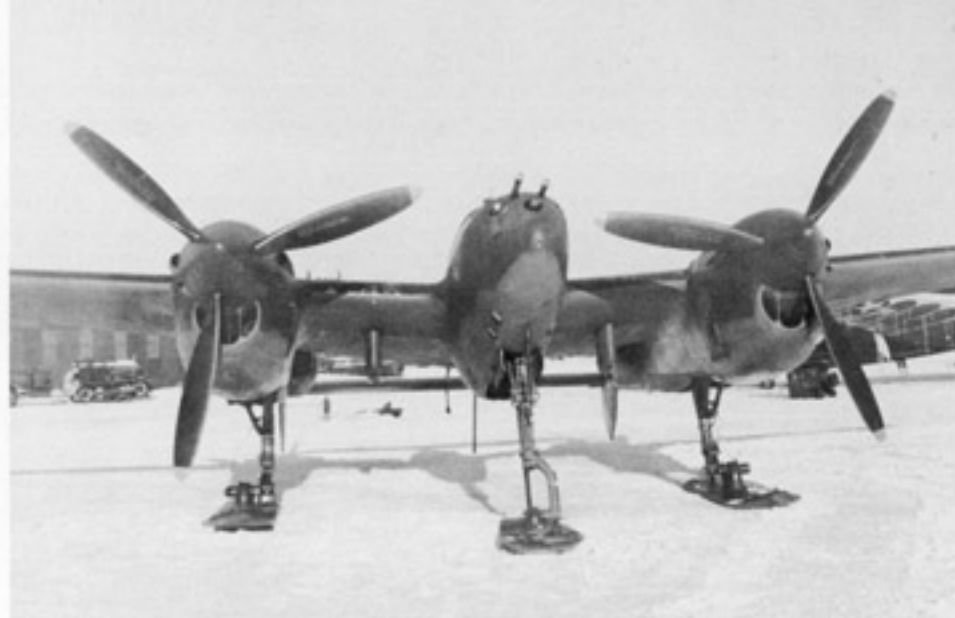
External
Armor Glass





This Lightning of the 82nd Fighter Group in Italy is armed with four 500 pound bombs and will also be loaded with the two 165 gallon drop tanks on the ground under the aircraft. This was a field installation, since no factory P-38 had over one pylon under each wing center section. (Lockheed)

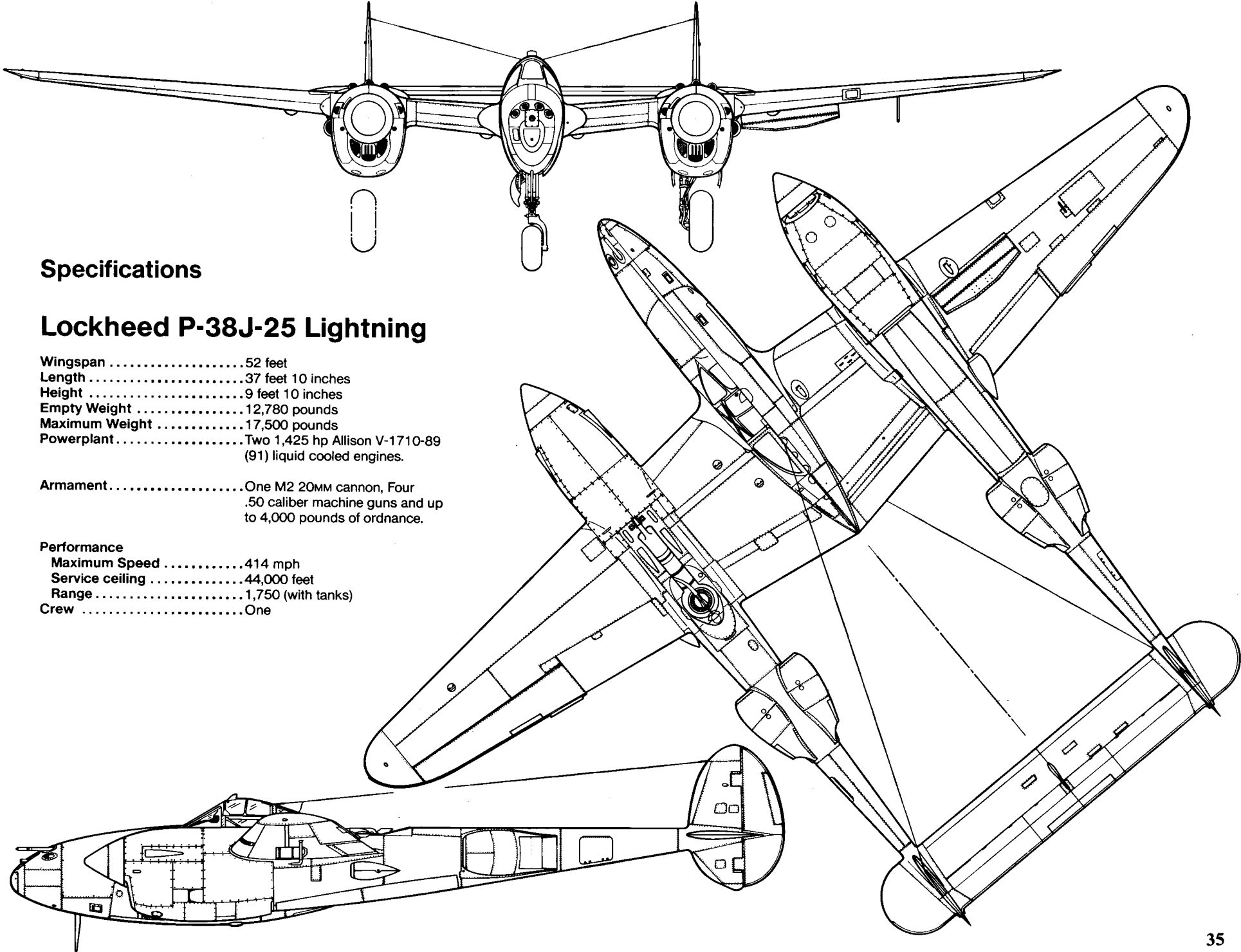
Armorsmen mount 4.5 inch bazooka rocket tubes to the fuselage sides of this P-38J of the 459th FS/80th FG in India. Known as the "Twin-Tailed Dragons," the 459th FS flew both air-to-air and air-to-ground missions against Japanese positions in Burma and China. (Ernie McDowell)



This P-38J was fitted with a set of Federal Aircraft Retractable Skis for Arctic operations. The skis were mounted on the landing gear struts and retracted into modified landing gear bays (without doors). The tests were conducted at Ladd Field, Alaska during March of 1944. (Lockheed)

MARY'S ROSE/WINNE, a P-38J of the 485th FS/370th FG on the ramp at Florennes, Belgium, during the Fall of 1944. The D-Day bands have been overpainted on the upper sides of the nacelles and wings. P-38 units in the 9th AF were used mainly in the ground attack role. (AFM)





Specifications

Lockheed P-38J-25 Lightning

Wingspan 52 feet
Length 37 feet 10 inches
Height 9 feet 10 inches
Empty Weight 12,780 pounds
Maximum Weight 17,500 pounds
Powerplant Two 1,425 hp Allison V-1710-89
(91) liquid cooled engines.

Armament One M2 20mm cannon, Four
.50 caliber machine guns and up
to 4,000 pounds of ordnance.

Performance

Maximum Speed 414 mph
Service ceiling 44,000 feet
Range 1,750 (with tanks)
Crew One



Libb Nanny/Roxie, a P-38J of the 77th FS/20th FG parked on the grass at Kings Cliffe. The aircraft has suffered some battle damage to the right rudder. The nose was polished metal with a White band in the hope that Luftwaffe pilots could mistake it for one of the unarmed "Droop Snoot" P-38s. (AFM)



Murph III, a P-38J of the 55th FS/20th FG taxis in at Kings Cliffe, England. The aircraft's score board shows a total of twenty-five missions and three kills. (Don Garrett, Jr.)

Les Vin, Les Femmes, et Les Chansons, French for "Wine, Women, and Song," was flown by MAJ Sabo, CO of the 485th FS at Florennes during the Fall of 1944. The aircraft is a P-38J-25 (44-23675) with the landing light in the wing leading edge and dive recovery flaps. (Lockheed)



Mon Amy, a P-38J of the 71st FS, was flown by LT Herbert Hatch when he was credited with shooting down five FW-190s during a mission to Ploesti on 10 June 1944. Hatch was the only 71st FS pilot to return from the Ploesti raid (the squadron lost fourteen P-38s on the mission).





My California Cutie/Mary was a P-38J from the 485th FS/370th FG at Florennes, Belgium. The Black cross on the aircraft data block on the nose indicates that this P-38J had fuel tanks installed in the wing leading edges. (AFM)



Black Barney, a P-38J of the 20th FG, on its belly at Kings Cliffe, England. The aircraft was the P-38 normally flown by COL Barton Russell, commander of the 20th FG during early 1944. It was also flown by the first P-38 ace in the 8th AF, LT James Morris. (Ernie McDowell)

Wilma II/Joyce, was a 79th FS/20th FG P-38J based at Kings Cliffe, England. The aircraft carried complete D-Day markings on the wings and booms. The front of the engine nacelles and spinners are Yellow, with the name in Black. (AFM)



Milo Burcham straps on his parachute prior to the first flight of *YIPPEE*, the 5,000th Lightning built. *YIPPEE* was a P-38J-20 and was painted Gloss Red, with the name in White on the nose and under the wings. (Lockheed)





BATTLE AXE was a P-38J-25 from the 431st FS/475th FG based at Biak Island during 1944. Without knowing the aircraft serial number, it is virtually impossible to distinguish a P-38J-25 from a P-38L, since all external features between the two are identical. (Don Garrett, Jr.)



This P-38J crashed in Germany, was rebuilt, made flyable by the Luftwaffe and flown in the training role. Another captured P-38 was used by an Italian Air Force pilot in combat, shooting down at least one B-17. (Hans-Heiri Stapfer)

This P-38J of the 37th Fighter Squadron, 14th Fighter Group on the Island of Corsica during 1944 was named *Educated Eddie*. (SGT James Crow)



AP-38J of the 24th Fighter Squadron starts its starboard engine prior to a patrol over the Caribbean approaches to the Panama Canal. The long range of the P-38 was well suited to the vast ocean patrol areas around the Canal Zone. (Art Krieger)





CAPT Robert DeHaven stands beside his P-38 at Blak Island during 1944. CAPT DeHaven scored a total of fourteen victories while attached to the 7th Fighter Squadron, 49th Fighter Group. (Don Garrett, Jr.)



1st LT Carroll Anderson flew this P-38J named VIRGINIA MARIE while assigned to the 433rd FS/475th FG based at Hollandia, New Guinea. The propeller spinners, tail tips, and wing bands are Medium Blue with a thin White border. (Don Garrett, Jr.)

Jimmy II/Pride, was a P-38J of the 485th Fighter Squadron, 370th Fighter Group based at Florennes, Belgium during late 1944. *Jimmy's* scoreboard shows twenty-five fighter escort missions and thirty-four bombing mission. The national insignia on the boom has been over-sprayed with a light coat of Gray paint. (Lockheed)





MAJ R.I. "Pappy" Cline flew *PAPPY'S Birdie* when he took command of the 431st Fighter Squadron, 475th Fighter Group following the death in combat of MAJ Thomas McGuire. (AFM)

The Hornet was a P-38J used as a racer at the 1948 Thompson Trophy Race held in Cleveland, Ohio. The overall Black Lightning had Yellow spinners and lettering. The aircraft was sponsored by Sky Ranger Aviation Oil. (David McLaren)



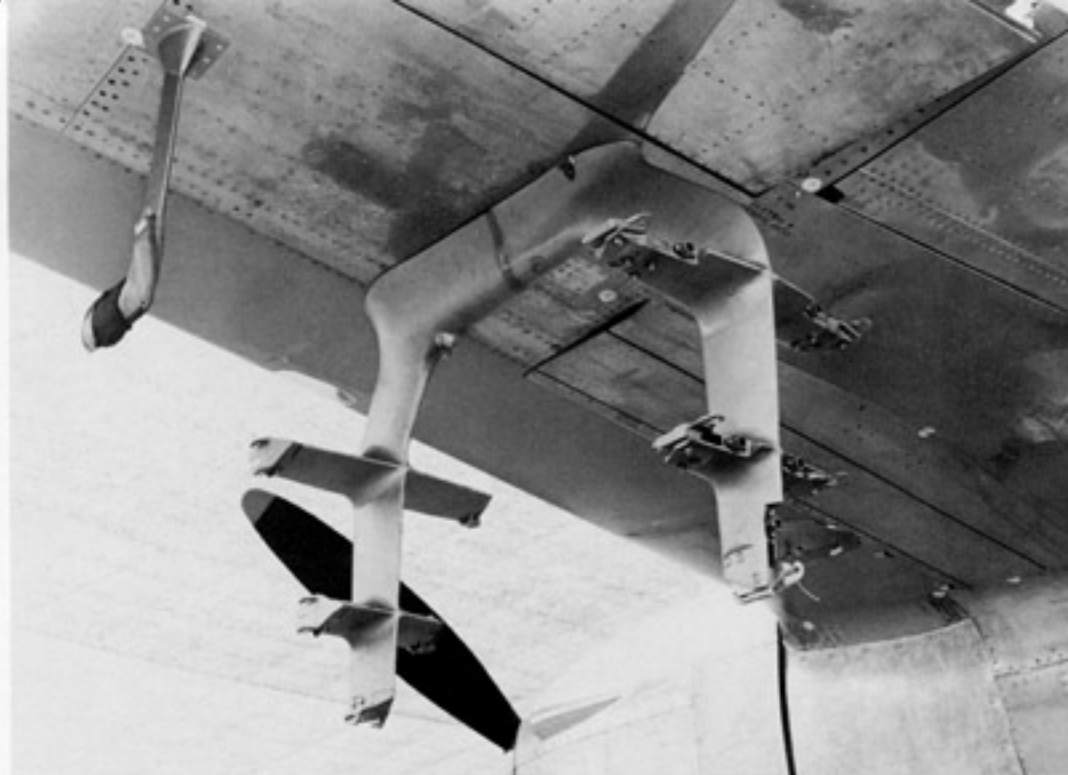
Kelly Johnson and Milo Burcham discuss the flying characteristics of the P-38J-25 equipped with the "dive recovery flaps" (which are visible above their heads). These flaps effectively eliminated the compressibility problem with the P-38. (Lockheed)

P-38L (Model 422)

The P-38L was the final production variant of the Lightning series and differed very little from the late production P-38J. The major change was in power plants. The P-38L was powered by the 1,600 hp Allison V-1710-F30R and -F30L engines. Additionally the armament was changed with the addition of underwing 4.5 inch rocket launcher "trees." These replaced the earlier twin, three tube bazooka type launchers and an experimental underwing zero-length launcher stub that had been fitted to the outer wing panel.

There were several equipment changes including the addition of the AN/APS-13 tail warning radar and mounting the gun camera in the leading edge of the left underwing bomb/drop tank pylon. A total of 3,924 P-38Ls were built by Lockheed and 113 were built at the Consolidated-Vultee plant in Nashville before production was halted by the end of the war.

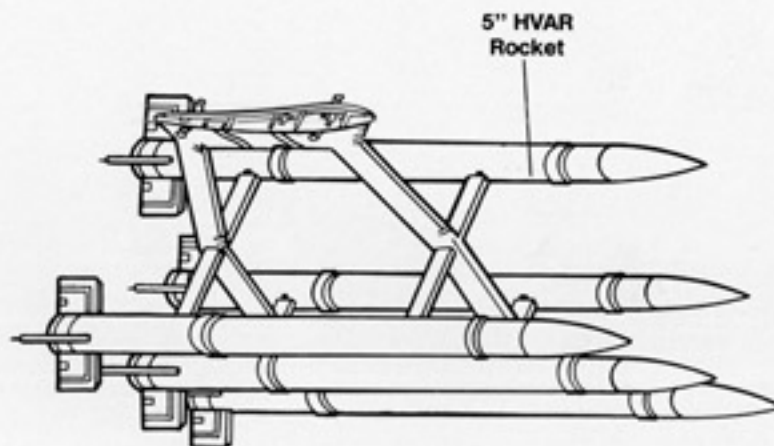
The 8th Air Force in England operated four P-38 fighter groups, the 20th, 55th, 364th and 479th. Since the P-38 was the most easily recognized aircraft in the Allied air Forces, it was the P-38 that was charged with air defense over the Normandy landings (several were still shot down by Allied gunners). By July of 1944, three of these Groups had transitioned to the P-51 Mustang leaving the 479th as the sole remaining P-38 group.



The "tree" rocket launcher was developed for use on the P-38L and held five 5 inch High Velocity Aircraft Rockets. Next to the tree is the pitot tube and just in front and to the right is the dive recovery flap. (Lockheed)

P-38L Five Rocket "Tree" Launcher

This P-38L was experimentally fitted with fourteen zero length launcher stubs for 5 inch HVAR rockets. This system was not adopted for service use since Lockheed had successfully developed the five rocket "tree" launcher. (Lockheed)





Lockheed test pilot Tony LeVier poses with a new production P-38L that he used to demonstrate the flight characteristics of the P-38 to USAAF pilots. The P-38L had the gun camera installed in the leading edge of the port under wing pylon. (Lockheed)



Although *Geronimo II* is from the 459th "Green Dragons" Fighter Squadron, it does not carry the dragon unit insignia on the booms. The aircraft was delivered in overall natural metal, but was camouflaged Olive Drab over Light Gray in the field. (Lockheed)

The commander of the 343rd FG at Shemya Army Air Base, Alaska flew this P-38L during 1945. The four squadron colors of Blue, White, Red and Yellow are repeated on the nose, tail tips, and spiraled on the main wheel covers.





MAJ Thomas McGuire discusses a mission with United Aircraft civilian tech rep, Charles Lindbergh. Lindbergh was to train the 475th FG pilots in methods to extend the range of their P-38s. In any event, he flew more than one actual combat mission and scored at least one confirmed victory. (AFM)



A P-38L of the 82nd Fighter Group on patrol over Italy during 1944. The P-38L was externally virtually identical to the P-38J-25 differing primarily in the power plants installed. The P-38L was powered by the Allison V-1710-F30R and L engines rated at 1,600 hp in the War Emergency setting. (Lockheed)

Armament testing with the P-38 went on constantly throughout the war. This P-38L has eight .50 caliber machine guns in the nose and four additional guns housed in pods under the wings. Another P-38 was tested with .60 caliber machine guns. (Fred Dickey via Ernie McDowell)



The Black circle around the Red M on the tail of this P-38L identifies it as being assigned to the 24th Fighter Squadron based at France Field in the Canal Zone. The leaping Tiger on the nose badge was the unit emblem of the 24th FS. (Art Krieger)





COL Charles MacDonald flew five different P-38s, all named *PUTT PUTT MARU*, while with the 475th FG. This aircraft, a P-38L (44-25471) was the fifth *PUTT PUTT*, which MacDonald flew when he commanded the 475th FG. MacDonald scored a total of twenty-seven victories. (Don Garrett, Jr.)



With the end of the Second World War, many surplus USAAF aircraft were sold to other nations. This P-38L was one of several flown by the Honduran Air Force before being brought back to the U.S. for restoration. (Roger Besecker via Dave McLaren)

This P-38L, sitting derelict in a Wisconsin field, is unusual in that it carries the post 1947 Star and Bar national insignia and a Black Buzz number. The aircraft was slated to become a memorial to Richard Bong, the leading American ace of the war. (Bob Esposito)



P-38s of all types were supplied to Allied nations both during and after the war. This new production P-38L, taxiing away from the LAT ramp for a test and acceptance flight, carries the markings of the Chinese Air Force. (Lockheed)



P-38M Night Lightning

To meet the Army's need for a night interceptor aircraft, several types were tried such as the British Bristol Beaufighter and deHaviland Mosquito, both obtained on a reverse Lend Lease from the RAF. Another type deployed to the Pacific was the Douglas P-70, a conversion of the A-20 Havoc light bomber. In any event, none of these adequately met the Army's requirements.

In the Pacific, there had been several field conversions of standard P-38 fighters to the night-fighter role. The most successful of these P-38 conversions was done by members of the 6th Night Fighter Squadron on New Guinea. The 6th NFS mounted two SCR-540 Airborne Intercept (AI) radar units (taken from P-70s) into modified P-38 drop tanks. These were mounted on a pair of P-38Gs and both aircraft were also modified to have a second person in the space behind the pilot seat normally occupied by radio equipment. The 547th NFS used a pair of single-seat P-38Js that were converted by Western Electric with the installation of a U.S. Navy AN/APS-4 AI radar pod under the wing. One of these P-38J night-fighters later shared a victory with a P-61 Black Widow crew from the same unit.

These converted aircraft, however, were viewed as stop gap measures and none met the AAF needs for a true night-fighter. As a result, the Army and Lockheed began development of a production P-38 night-fighter during 1944. This involved the conver-

sion of a single-seat P-38J, with an AN/APS-4 AI radar pod mounted under the nose on a modified bomb pylon. The prototype aircraft was built at Wright Field, home of the USAAF Air Development Center. Several P-38Js were converted and tested both in the U.S. and under combat conditions in the Pacific.

Finally, during late October of 1944, Army contracted Lockheed's Dallas Modification Center to build the production night-fighter under the designation P-38M. Seventy-five aircraft were taken from the P-38L production line and sent to the Dallas facility where the following modifications were made: a modified underwing pylon was installed under the nose to mount an AN/APS-4 AI radar pod, the cockpit area was reconfigured to include a full second cockpit with a new raised bubble canopy over the radar operator and flash hiders were added to the guns. On 5 January 1945, the first P-38M made its maiden flight.

The training of P-38M Night Lightning crews was done at Hammer Field, California, during early 1945. Hammer Field was also the training base for P-61 Black Widow crews. Training of the initial crews was finished during the early Summer of 1945, however, the war ended before any aircraft or crews were actually deployed into combat.

Four of the overall Gloss Black P-38Ms and their crews were part of the USAAF Occupation Forces in Japan as part of the 418th Night Fighter Squadron based at Atsugi, Japan, during early 1946. By March of 1946, however, the 418th NFS was back on Okinawa where the P-38M Night Lightnings were phased out of service.

This P-38J was used to test a number of the systems used in the P-38M night-fighter. This aircraft was fitted with small T shaped airborne intercept radar antennas under the port wing and horizontal stabilizer. (Robert F. Dorr)



Lockheed test pilot Milo Burcham prepares to taxi one of the production P-38M Night Lightnings. All P-38Ms were modified from P-38L airframes at Dallas and carried the same equipment standard as the P-38L, including the underwing rocket "tree" launchers. (Robert F. Dorr)





The rear cockpit of the P-38M had the radar scope and associated equipment. The long tube like object is the radar scope hood, used to keep out reflections. The front cockpit was the same as a standard P-38J/L. (Lockheed)

With the canopy closed, there was very little head room for the radar operator. P-38Ms were all delivered from Lockheed's Dallas facility in an overall Gloss Black color scheme with Red numbers and lettering. (Lockheed)



Night Lightning, a new production P-38M on the ramp at Lockheed's Dallas, Texas, facility. The AN/APS-4 AI radar pod was mounted under the nose with a modified P-38 drop tank pylon. The guns were all fitted with flash hiders to keep from blinding the pilot when they were fired at night. (Lockheed)



This AN/APS-4 AI radar pod was mounted on a modified drop tank pylon on the P-38J that served as the prototype for the P-38M. The aircraft was built at Wright Field in the Summer of 1944. (AFM)

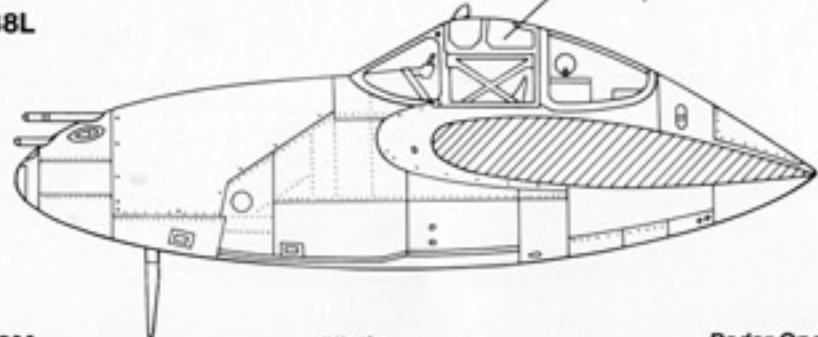


Lockheed built seventy-five P-38M Night Lightnings before the war ended; however, only four saw active service. These aircraft were assigned to the Occupation Force in Japan. The natural metal areas surrounding the superchargers was for heat reflection. (Lockheed)

Fuselage Development

P-38L

Single Seat
Cockpit



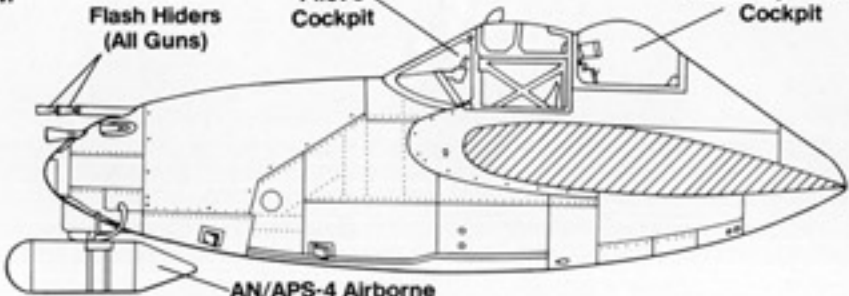
P38M

Flash Hiders
(All Guns)

Pilot's
Cockpit

Radar Operator's
Cockpit

AN/APS-4 Airborne
Intercept Radar



The P-38M Night Lightning had the radio antenna mast moved from under the nose to a position under the port boom near the radiator housings. (Lockheed)



Photo Reconnaissance Lightnings

It was obvious from the beginning of the Second World War that aerial reconnaissance was going to be as important, if not more important, than both the bombardment and fighter missions. The Allied commanders had to know where the target was, what its defenses were, if it was camouflaged and what surrounded it. Following the attack, it was necessary to find out if the target had been eliminated or if it needed to be attacked again.

With the vastness of the war, it was obvious that most of the reconnaissance would have to be performed by long range aircraft. During 1941 only the bomber types, like the B-17 and B-24 could fulfill the long range reconnaissance mission. These bomber types had some serious drawbacks: they were big, slow and, operating alone, were an easy prey for enemy fighters. What the USAAF needed was a high speed, long range aircraft built strictly for the reconnaissance mission. During early 1941, the P-38 was the only aircraft that met these requirements.

The Army Air Force and Kelly Johnson came to the conclusion that a modified P-38E, with its guns replaced by aerial cameras, would be the best aircraft for the reconnaissance mission. Although many aircraft were modified throughout the war and pressed into service as reconnaissance aircraft, it was the P-38 Photo Lightning that was known as the best reconnaissance aircraft of the Second World War—in any air force! During the Fall of 1941 Kelly Johnson had Lockheed's mechanics remove the entire gun system from a P-38E and replaced it with a pair of twenty-four inch focal length K-17 vertical format cameras.

A second aircraft was built during December of 1941 and, after the outbreak of the war, the reconnaissance mission was quickly brought to the forefront. Production of reconnaissance conversions actually outstripped fighter production during January 1942 and by the end of the war, Lockheed had built over 1,400 Photo Lightnings.

F-4-1-LO

The first two Photo Lightnings were delivered during December of 1941 under the designation F-4-1-LO. The F-4-1-LO was a standard P-38E airframe modified with a pair of K-17 fixed vertical cameras in place of the fighter's guns and ammunition. The gun ports in the nose cap were simply covered with sheet metal patches. Although the majority of F-4s were unarmed, a number of F-4-1-LOs and F-4As retained a pair of .50 caliber machine guns.

The F-4-1-LO was the first production Lightning variant to be fitted with underwing fuel tanks. Almost all of the photo reconnaissance Lightnings built were actually modifications of standard fighter airframes. The modification work was carried out at Lockheed's Dallas, Texas, modification center.

During 1941 Lockheed built 205 P-38 fighters and two F-4-1-LOs. During January of 1942 F-4 production outstripped fighter production eighty-four to thirty-two. The first F-4-1-LO missions were flown during April of 1942 by members of LTCOL Karl "Pop" Polifka's A Flight of the 8th Photo Reconnaissance Squadron. It was Polifka flying an F-4-1-LO that spotted the Japanese task force bound for Port Moresby on 7 May 1942. This mission led directly to the Battle of the Coral Sea and the first defeats for the Japanese



This F-4-1-LO Photo Lightning served in North Africa during January of 1943. The F-4-1-LO was a P-38E airframe with the guns replaced by a pair of K-17 vertical cameras in the gunbay. (AFM)

Navy. Besides use by the USAAF, three F-4-1-LOs were built and delivered to the Royal Australian Air Force (RAAF) for service in the Southwest Pacific. A total of ninety-nine F-4-1-LOs were built at Dallas.

F-4A-1

Like the F-4-1-LO, the F-4A-1 was based on the P-38E airframe. The F-4A-1 differed from the earlier variant in the camera installation. The F-4A-1 had a six inch focal length K-17 trimetrogon (vertical and oblique) camera array which made it necessary to add a pair of square windows (one on each side) in the camera bay doors. There were a total of twenty F-4A-1s converted.

XF-5D

The XF-5D was a conversion of an F-5A-10 with a single vertical camera and a photo-navigator in the empty gun compartment. The second crewman had a small bubble canopy in place of the nose cap. The XF-5D also retained two .50 caliber machine guns in the nose. A second K-24 camera was to be installed in the rear of one of the booms. The aircraft was similar to the P-38J Droop Snoot and only one aircraft was modified.

F-5A-1

Based on the P-38G airframe, the F-5A-1 was a great improvement over the earlier F-4A with more available horsepower, better cameras and better camera mounts. Twenty late production P-38Gs were converted, with the first aircraft being delivered during August of 1942.

F-5A-3

There were only 20 F-5A-3s converted from P-38G-1 airframes.

F-5A-10

The F-5A-10 was a conversion of the P-38G-10 and was the photo reconnaissance workhorse of the 12th Air Force in Italy. There were a total of 140 F-5A-10s built.

F-5B-1

F-5B-1s were converted from P-38J-1 airframes and were the first Lightnings to be fitted with the Sperry autopilot. There were several different F-5 camera configurations, but the most common consisted of two six inch K-17 oblique cameras, a twelve or twenty-four inch K-17 vertical camera (center section) and a K-18 twenty-four inch vertical camera (rear section). There were a total of 200 F-5B-1s built.

F-5C-1

Lockheed converted a total of 128 P-38J-5 airframes to F-5C-1 specifications.

F-5E-2

F-5E-2s were converted from P-38J-15 airframes, with 100 aircraft being modified at Dallas. The F-5E-2 normally carried three K-17 vertical cameras and a pair of K-22 oblique cameras. One F-5E-2, named **Dot-Dash**, was the first combat aircraft to complete a shuttle mission from an English base to a base in Soviet-held territory.

F-4-1LO

(P-38E Airframe)

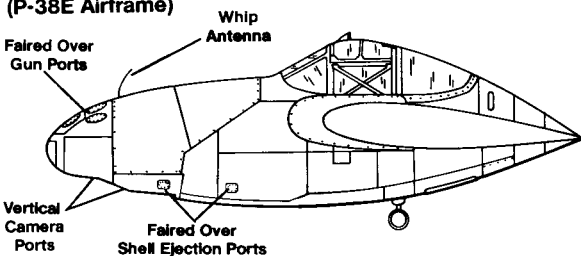
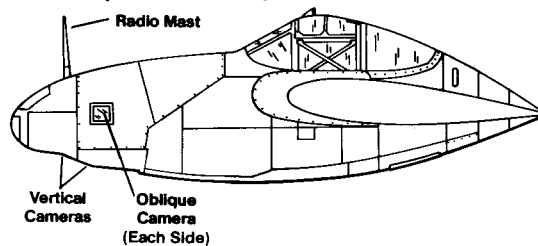


Photo Variants

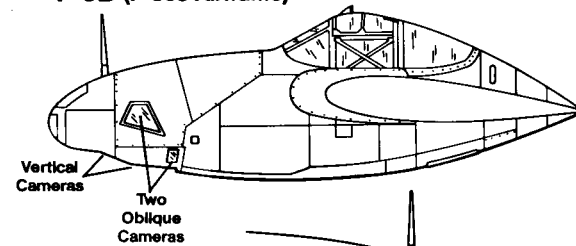
F-4A-1 (P-38E Airframe)



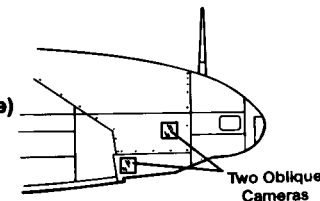
F-5A-1 (P-38G Airframe)

F-5A-10 (P-38G Airframe)

F-5B (P-38J Airframe)



F-5A-1 (Starboard Side)



F-5E-3

Lockheed converted a total of 105 P-38J-25s to F-5E-3 variants.

F-5E-4

The F-5E-4 was the first photo reconnaissance variant based on the P-38L airframe. The F-5E-4 differed from earlier photo variants in that it was equipped with four K-17 trimetrogon cameras. Lockheed built a total of 508 F-5E-4, all of which had the same improvements as the P-38L.

F-5F-3

An unknown number of P-38L-5 airframes were converted at Dallas to F-5F-3 standards. The F-5F-3 differed from other F-5s in the extended camera bay.

F-5G

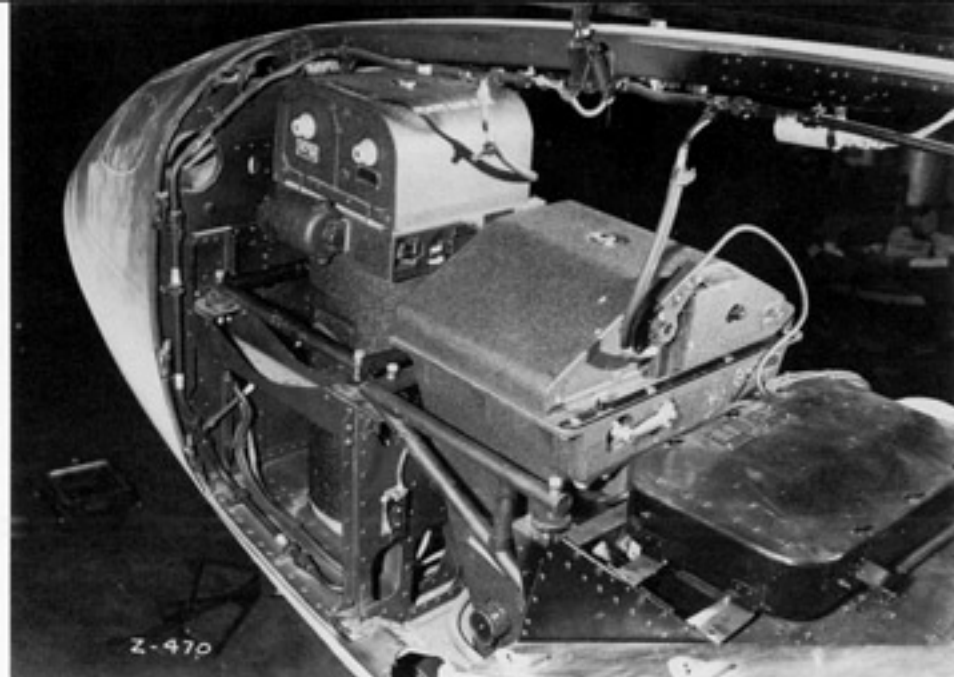
The F-5G was a conversion of the P-38L-5 airframes, complete with the left pylon gun camera mount, underwing dive recovery flaps, and the wing leading edge fuel tanks. The nose was completely reshaped and housed four standard cameras plus a forward oblique camera in the nose cap. The F-5G also had an ADF loop antenna mounted under the fuselage behind the nose landing gear well. The Dallas Modification Center built a total of sixty-three F-5Gs.

Besides use by the Army Air Force, there were four F-5s of varying sub-types transferred to the U.S. Navy in North Africa. The Navy designated these aircraft as FO-1 (BuNos 01209, 210, 211 and 212). The aircraft were flown from land bases for long range reconnaissance missions over the Mediterranean Sea.

Several F-4/F-5 aircraft, including a squadron of the latest F-5Gs, were flown by the Free French Air Force. The French Air Force crews were trained by U.S. Army Air Force pilots in the F-4-1-LO and the French flew their first missions in North Africa on 27 July 1943.



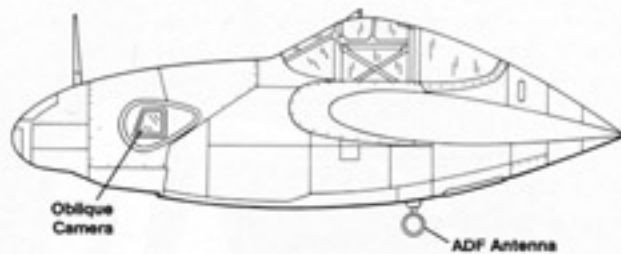
FOTO JO was an F-4-1-LO (later redesignated F-4C) of the 8th PRG based at Pandaveswar, India, during 1944. It carried an unusual camouflage of Medium Green uppersurfaces over Pale Blue undersurfaces. This F-4 was one of the few that retained two of its .50 caliber machine guns. (Fred Dickey via Ernie McDowell)



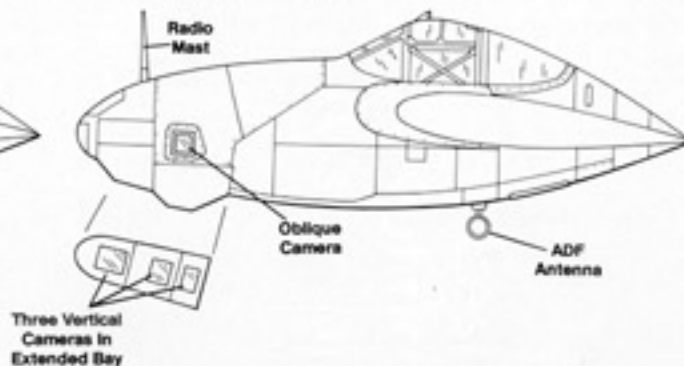
The camera bay of the F-4-1-LO had a pair of K-17 vertical cameras installed. Later models of the Photo Lightning had up to six cameras. The gun ports were covered and faired in with riveted sheet metal patches. (Lockheed)

Photo Variants

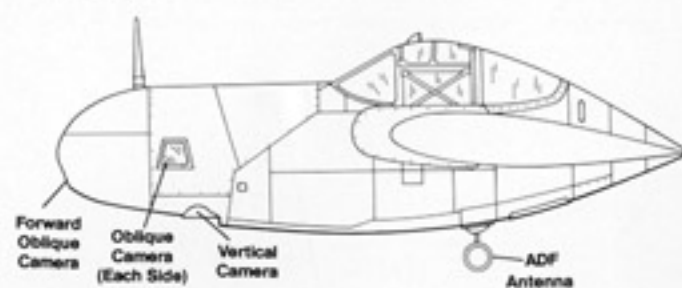
F-5E-4 (P-38L Airframe)



F-5F (P-38L Airframe)



F-5G (P-38L Airframe)



F-5F (Starboard Side)





An F-4-1-LO of the 17th Photo Reconnaissance Squadron at Fighter Strip 2 on Guadalacanal during 1943. This F-4-1-LO has been modified with the addition of a pair of K-17 oblique cameras in addition to the normal vertical cameras. (Canning)



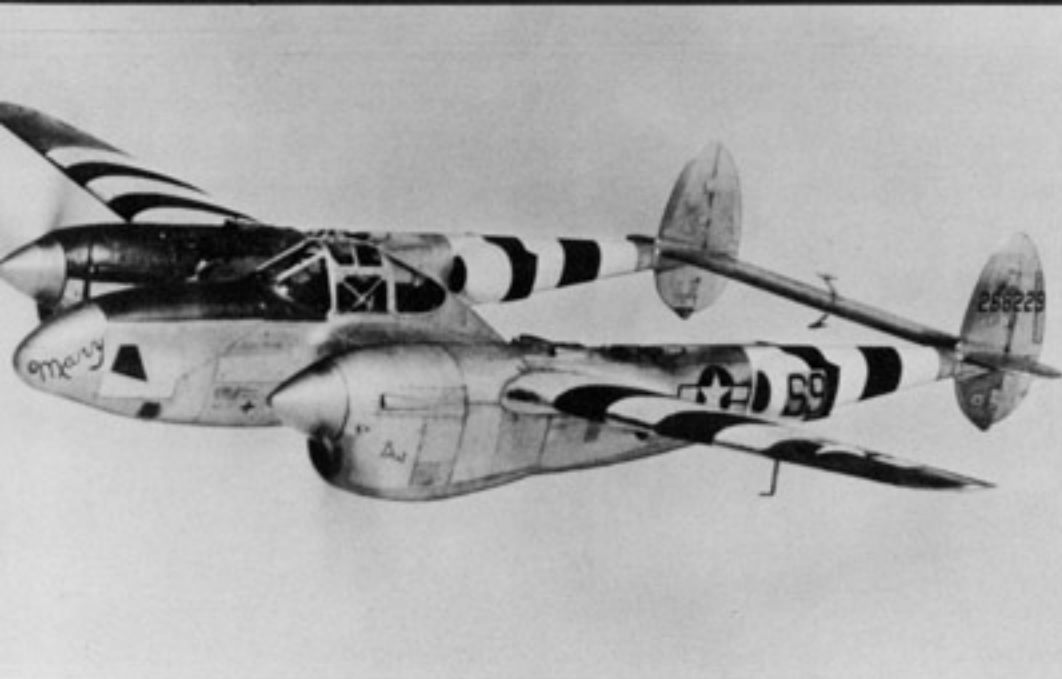
Super Snooper was an F-4A-1 of the 33rd PRS/10th PRG at Exchwege, Germany, during 1945. The Photo Lightning was equipped with a forward oblique (or dicing) camera in the nose and carried "dice" as mission markings. (AFM)

A pair of F-5A-1s share the Marston matting ramp at Adak with fighter P-38s during the Summer of 1942. Lockheed built twenty F-5As using modified P-38G airframes. (AFM)



This F-4A-1 of the 8th PRG in India carried a football-shaped ADF loop antenna over the canopy. Haze camouflage involved painting the entire aircraft Black, then over-spraying it with White in varying degrees. The large square camera oblique window was a feature of the F-4A-1. (Vaclav Simecek)





Mary/Bret, an F-5B-1 of the 34th PRS/10th PRG, still carried full D-Day invasion stripes on 10 June 1944. The F-5B-1 was basically a P-38J airframe modified with a camera nose from the F-5A-10. (SGT James Crow)



Star Eyes, an F-5B of the 28th Photo Reconnaissance Squadron detachment based on Kwajalein Island during mid-1944, carried sixty-five mission markings on the nose in Black. (AFM)

A flight of F-5E-2s of the 34th PRS/10th PRG fly over Europe during the Summer of 1944. The upper wing and upper boom D-Day bands have been over-painted in PRU Blue. The last three digits of the serial (43-28624) are repeated on the cowling. (David Menard)



JUNIOR, an F-5E-2, taxis out at Yontan Airfield on Okinawa during July of 1945 ahead of a C-46 transport. The aircraft carried the late Black tail markings of the 28th PRS. Lockheed modified 100 P-38Js to F-5E-2 standards. (AFM)





anna, an F-5E-2 from the 3rd PRG on final approach to its base at Florence, Italy during late 1944. The aircraft was natural metal with the rear of the booms painted Silver. The tail was Black with White numbers, the spinners were Red and White and the name was Red with a Black outline and Black "head." (Lockheed)



TURBO ANNY was a highly decorated F-5E-2 of the 34th PRS/69th TRG based at Haguenau, France during the Spring of 1945. She carried at least 111 small Swastikas on the nose indicating photo missions over Germany. The unusual shroud ahead of the forward K-17 camera was designed to keep debris off the camera window. (Chris Goodman via Art Krieger)

An F-5E-3 of the 21st Photo Reconnaissance Squadron takes off from its base at Hsian, China, during 1945. *Scandalous Lady* was one of 105 P-38Js modified to the F-5E-3 configuration. (George McKay)

Viola II was an F-5E of the 34th PRS/67th TRG based at Furth, Germany during 1945. "Viola" was flown by CAPT H.R. Siek and carried a photo of his wife and child on the port camera window door. The Yellow nose carried sixty-eight mission markings. (Chris Goodman)





A pair of 8th PRS F-5G-6s share the ramp at Yontan during 1945. Lockheed's Dallas Modification Center built sixty-three F-5G-6s. These Photo Lightnings have both been modified with football-shaped ADF loop antennas under the nose ahead of the nose wheel well. (David Menard)



The F-5G Photo Lightning used a P-38L-5 airframe with a camera nose employing a forward looking oblique, or "dicing" camera in addition to the K-17 oblique and K-18 vertical cameras. (Lockheed)

A French Air Force F-5A-1 of GR 2/33 at La Mersa, Tunisia during 1943. Although the aircraft appears to be camouflaged Haze, it was actually camouflaged in Dark Earth and Dark Green uppersurfaces over Light Gray undersurfaces. (AFM)



Three French Air Force F-5G-6s of GR 2/33 fly over Europe during 1945. The Free French obtained F-4 and F-5 aircraft under the Lend Lease Act. The aircraft in the foreground has had the French roundel simply painted over the U.S. star and bar insignia on top of the port wing. (Hans-Heiri Stapfer)



Droop Snoot

The P-38 Droop Snoot was the brainchild of COL Cass Hough and COL Don Ostrander of 8th Air Force Headquarters. The load-carrying capability of the P-38 made it a natural for use as a fighter-bomber. The later P-38 variants (P-38H/J/L) had the capability of carrying up to 4,000 pounds of ordinance — the same as a B-17 bomber! COLs Hough and Ostrander came up with the idea of using some type of a "leader" P-38 for level bombing missions. The advantages of using a fighter in the strategic bomber role were obvious: a much higher speed to and from the target, one tenth as many crew members involved in the mission, and fighter escort during the withdrawal phase was not required. What they proposed was the installation of a Norden bombsight in a Modified P-38, one housing a qualified bombardier/navigator in the aircraft's empty gunbay.

The project, given the code name DROOP SNOOT, was formulated at Lockheed's Langford Lodge modification center in Northern Ireland. A P-38H was modified by removal of the armament section in the nose, including the gun port nose cap. In its place was a solid wood nose cap, cut and shaped like the proposed bombardier nose. With some ballast added, the modified P-38H was flight tested to determine if there were any flaws in its flight characteristics. After successfully completing the flight tests, Lockheed modified a new production P-38J to full Droop Snoot prototype specifications.

The wooden nose of the P-38H test aircraft was used to construct a Plexiglas bubble bombardier nose cone. Armor plate was added to the sidewalls and floor of the bombardier compartment, along with the Norden bombsight, related bombing equipment, oxygen and navigational equipment. During late February of 1944 the P-38J Droop Snoot was rolled out at Langford Lodge.

The concept was so successful that the 8th AF immediately ordered first three, then fifteen Droop Snoot conversions. The total number built lies somewhere between twenty-three (those P-38Js actually converted at Langford Lodge) and 100 (the number of Droop Snoot conversion kits ordered by the AAF). The first combat mission was flown by the 20th Fighter Group on 10 April 1944, when a Droop Snoot led forty-two other 20th FG P-38Js on an attack against the Luftwaffe base at Gutersloh, Germany. Droop Snoot missions were not confined to just P-38 units. COL Hub Zemke used a Droop Snoot P-38J to lead his 56th FG Thunderbolts on at least one bombing mission. Additionally, more than one Droop Snoot was built as a plush VIP aircraft without bombing equipment.

Pathfinder

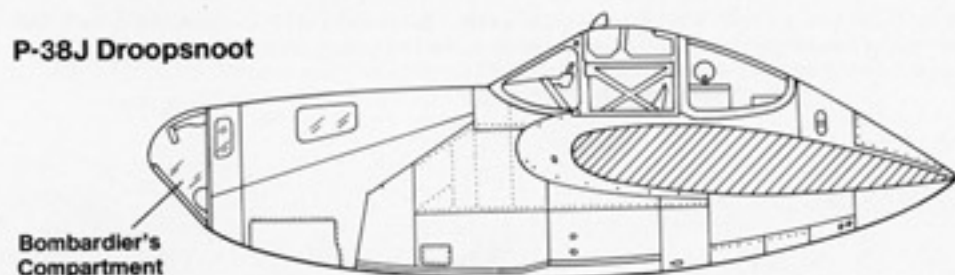
Another idea along the same lines as the Droop Snoot conversion was the P-38J/L Pathfinder aircraft. This was a Lockheed factory development involving the installation of the AN/APS-15 Bombing Through Overcast (BTO) radar unit, commonly known as a "Mickey" radar, in a modified P-38J/L nose. An entirely new, extended bulbous nose was fitted to a standard P-38J fighter during mid-1944. The new nose had windows cut into the area above the radar bombardier station and the bulbous nose was covered by an opaque Plexiglas bubble — similar to that used for early P-61 radomes. Inside the modified nose was the same equipment as found in a P-38 Droop Snoot except that the Norden visual bombsight was replaced by the BTO radar and its associated control panels.

Although the prototype was a modified P-38J, most production Pathfinders were conversions of P-38L airframes. It is believed that these aircraft were designated as P-38L-3. Several were built at Lockheed's Modification Center in Dallas, then sent to the combat theaters where they were used in both the radar bombing and radar mapping roles.

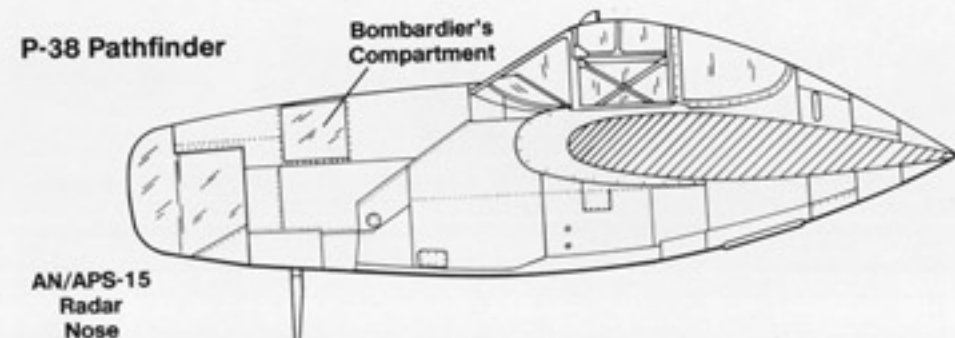


This P-38H (42-67086) was used to create and test the shape of the Droop Snoot bombardier nose for the P-38. The mockup nose was shaped from solid wood and was later used as a mold for the production Plexiglas nose. (AFM)

P-38J Droopsnoot

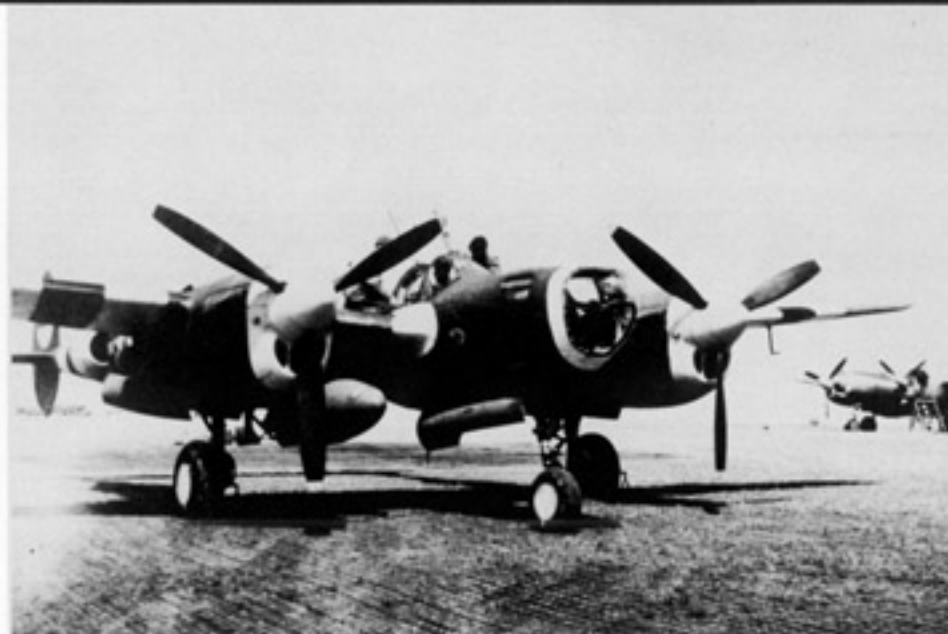


P-38 Pathfinder





CAROL was a P-38J Droop Snoot of the 82nd Fighter Group. The Droop Snoot conversions were kits built by Lockheed's Modification Center and shipped to combat units for installation in the field. (SGT James Crow)



CAPT Hershell "Eze" Ezell was the 20th Fighter Group's Lead Bombardier and flew in this Droop Snoot P-38J named *Eze Does It*. The 20th FG flew the first Droop Snoot bombing mission against Gutersloh Airdrome on 10 April 1944. (AFM)

This P-38J Droop Snoot was assigned to the 96th FS/82nd FG at Vincenzo Airfield, Italy. The aircraft is armed with three 500 pound bombs and a 165 gallon drop tank. The radio antenna mast was installed at an angle on all Droop Snoot aircraft. (Lockheed)

TRAIL BLAZER was a P-38J Droop Snoot of the 393th FS/367th FG based at Frankfurt, Germany during 1945. The Droop Snoot conversion included a Norden bombsight, bombing controls, additional oxygen and complete navigational equipment. (SGT James Crow)





A variant of the Droop Snoot was the P-38 Pathfinder aircraft. The Pathfinder was fitted with AN/APS-15 Bombing Through Overcast (BTO) radar housed in an oblique plastic nose cap in place of the usual Norden visual bombsight. (Lockheed)



The P-38 Pathfinder was based on the P-38J and L airframes. The P-38J Droop Snoot was a conversion kit that a combat unit could assemble in the field, while the Pathfinder conversions were all modified at Lockheed's Dallas Modification Center. (Lockheed)

Although this aircraft appears to be a Droop Snoot P-38, it is actually the XF-5D Photo Lighting, which was an F-5A modified with a short camera bay, a navigator's station, and a pair of .50 caliber machine guns. (Art Krieger)



Pursuit Ships in action



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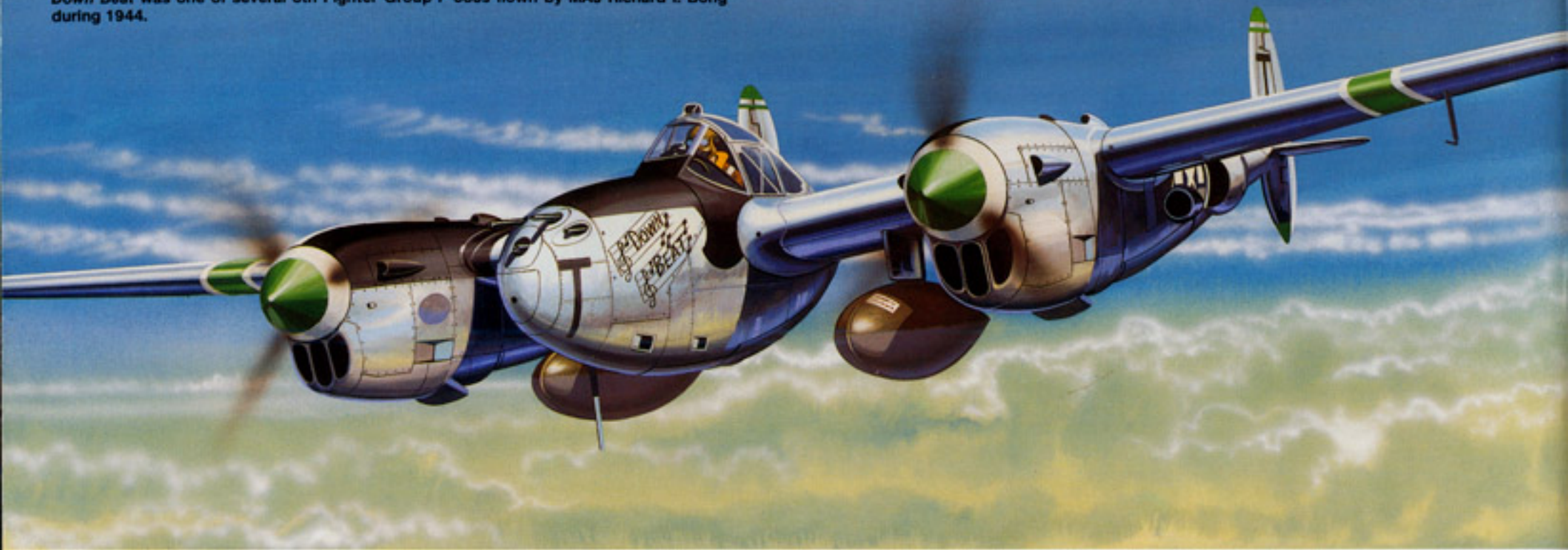


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from squadron/signal publications

Down Beat was one of several 8th Fighter Group P-38Js flown by MAJ Richard I. Bong during 1944.



SWEET DREAMS was an F-5E of the 33rd Photo Reconnaissance Squadron, flown by CAPT Archie Browne during August of 1944.



ISBN 0-89747-255-1
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