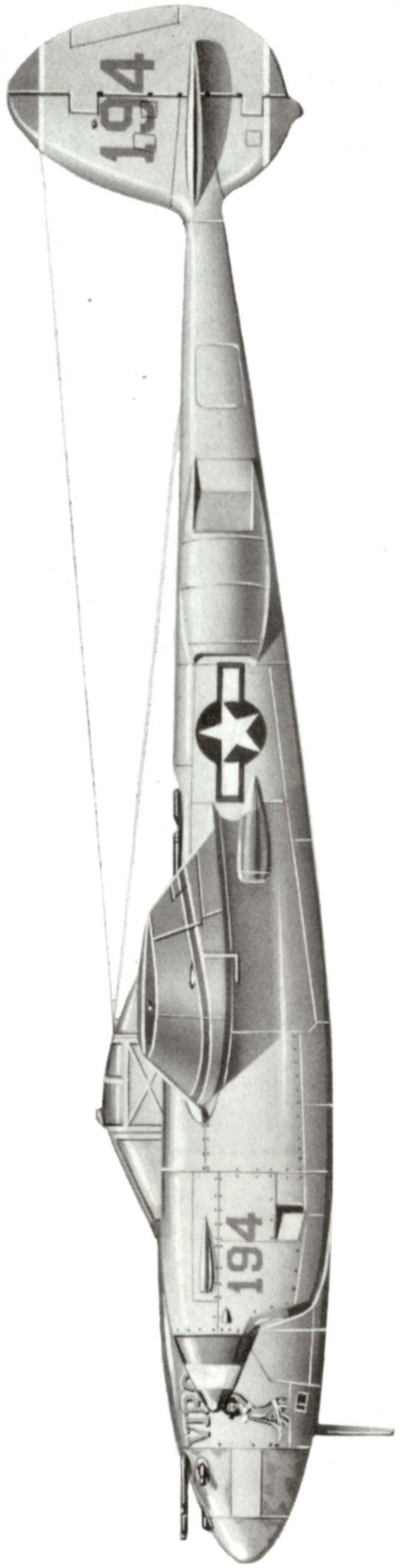
PROFILE PUBLICATIONS

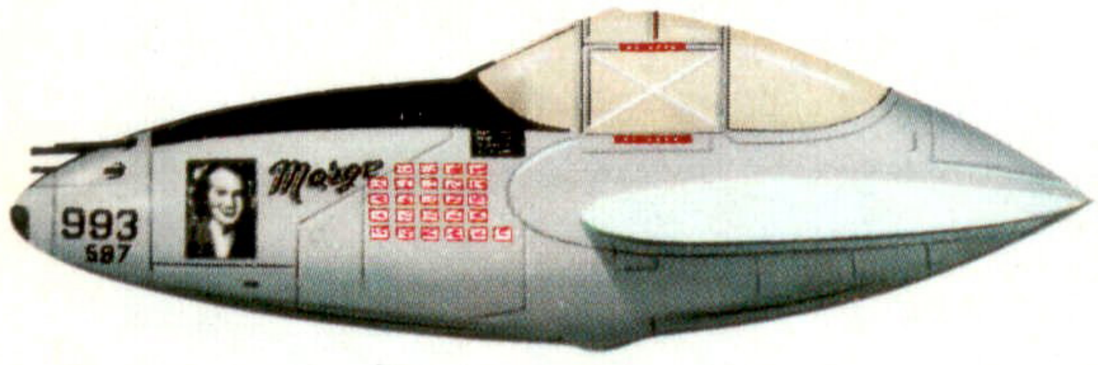
The P-38J - M Lockheed Lightning

NUMBER 106

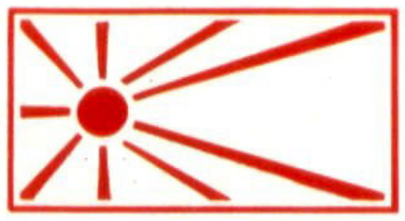
TWO SHILLINGS

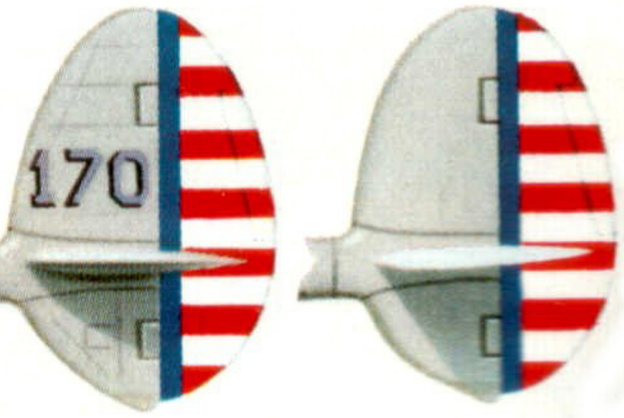


P-38J-15-LO, 42-103993, "Marge", flown by Major Richard Bong from October 1943 to March 1944. Photograph of Maj. Bong's fiancée Marjorie applied to a/c in January 1944; 25 victory flags displayed March 1944.

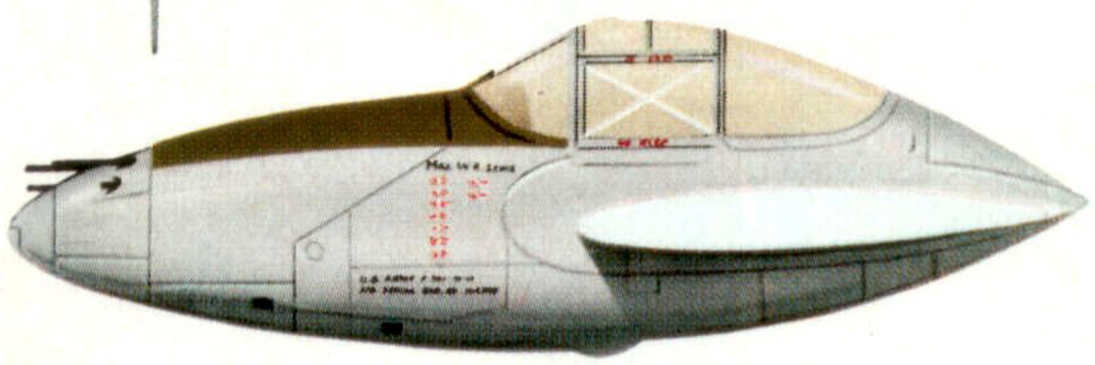


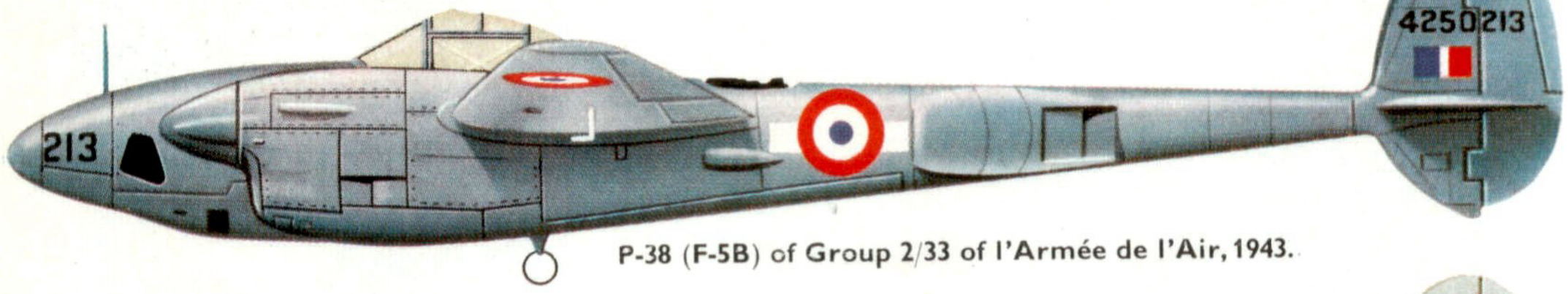
Marge





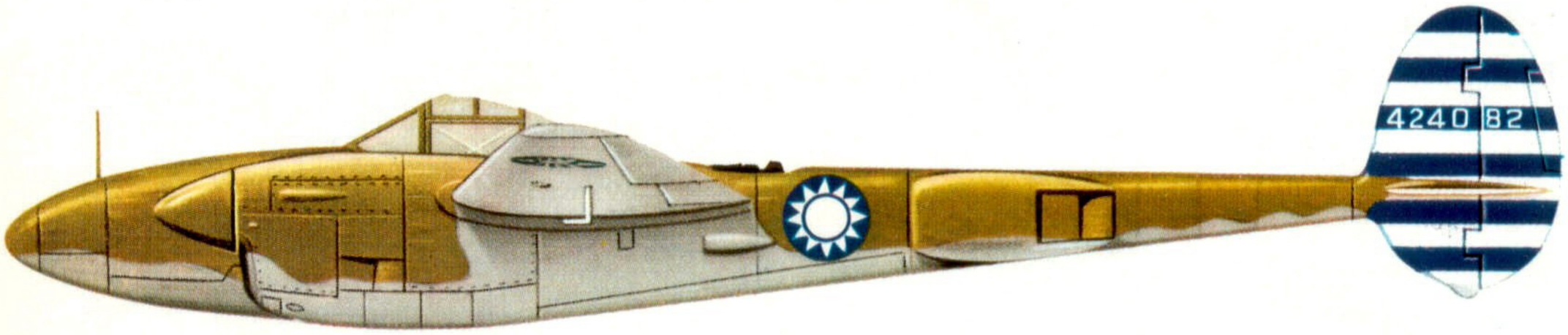
P-38J-15-LO, 42-104305, flown by Major Warren E. Lewis, commanding officer of 433rd Ftr. Sqdn., Dobodura and Biak Island, Dutch New Guinea, 1943-4. Nine victory flags. Right, marking style inside both tail assemblies.





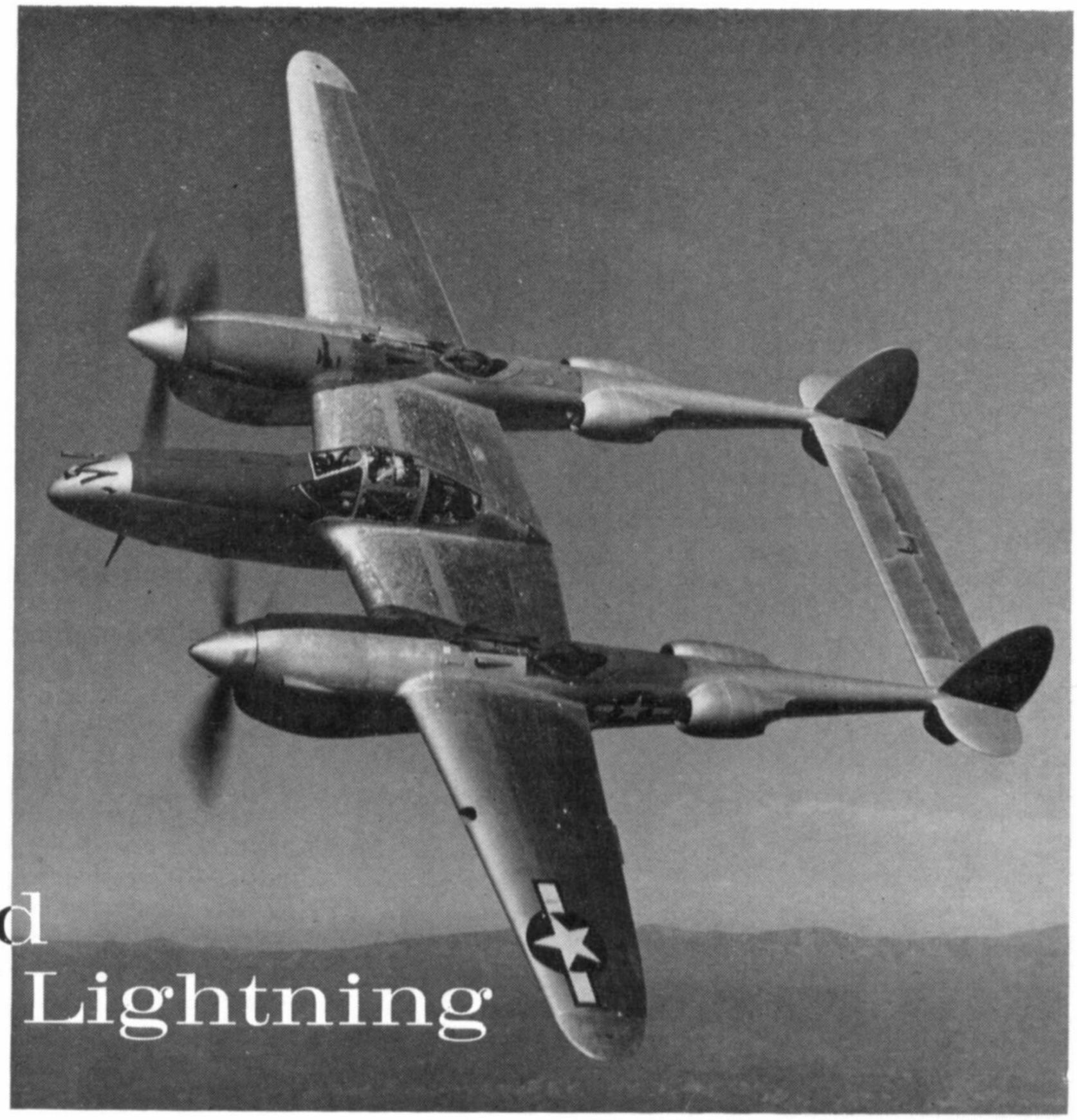
P-38 (F-5B) of Group 2/33 of l'Armée de l'Air, 1943.

P-38 (F-5G) of Group 2/33 of l'Armée de l'Air, 1944.



P-38L-1 of Chinese Nationalist Air Force.

P-38J, serial unknown, 27th Ftr. Sqdn., 1st Ftr. Grp., 15th Air Force, Italy.



P-38L-5, 44-25415, banks to port and shows off the Lightning's unique configuration. A controversial aircraft in service, the P-38 was undeniably a pioneer on several counts.
(Photo: Miller-Lockheed)

The Lockheed P-38J - M Lightning

by Le Roy Weber

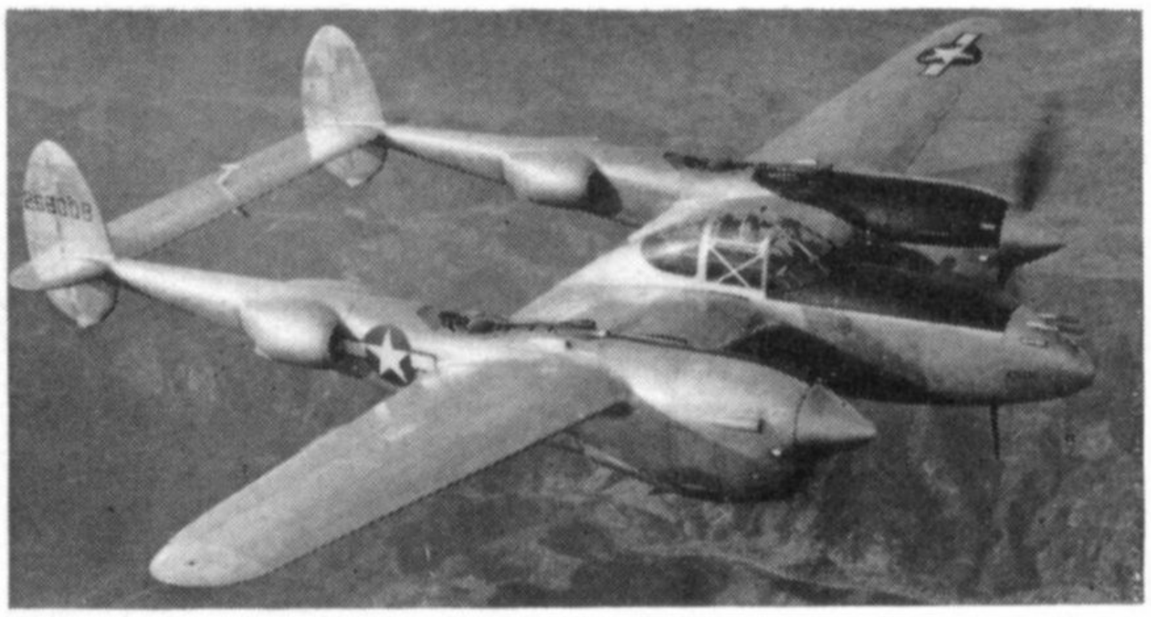
The P-38 was a controversial airplane. It was loved, trusted and depended upon by most pilots, but it was feared and mistrusted by others. It was employed efficiently by some. It was misused by others.

One thing is certain, the P-38 was among the most feared and respected aircraft to appear in Axis skies. Anyone who saw or heard a P-38 in flight never mistook it for any other plane. Its fire power was lethal and awesome up to the extreme range of its four ·50 calibre machine guns and its 20 mm. cannon. It was the most welcome sight that could meet a bomber crew's eyes over enemy territory, for there was no possibility of mistaking its identity. Its long range permitted it to accompany bombers to Berlin and beyond. It deserved its reputation as one of the best escort fighters of the war. Though it was plagued throughout its life by engine problems, its ability to return home on one engine was exceptional and a great many pilots survived otherwise fatal occurrences because of this fact.

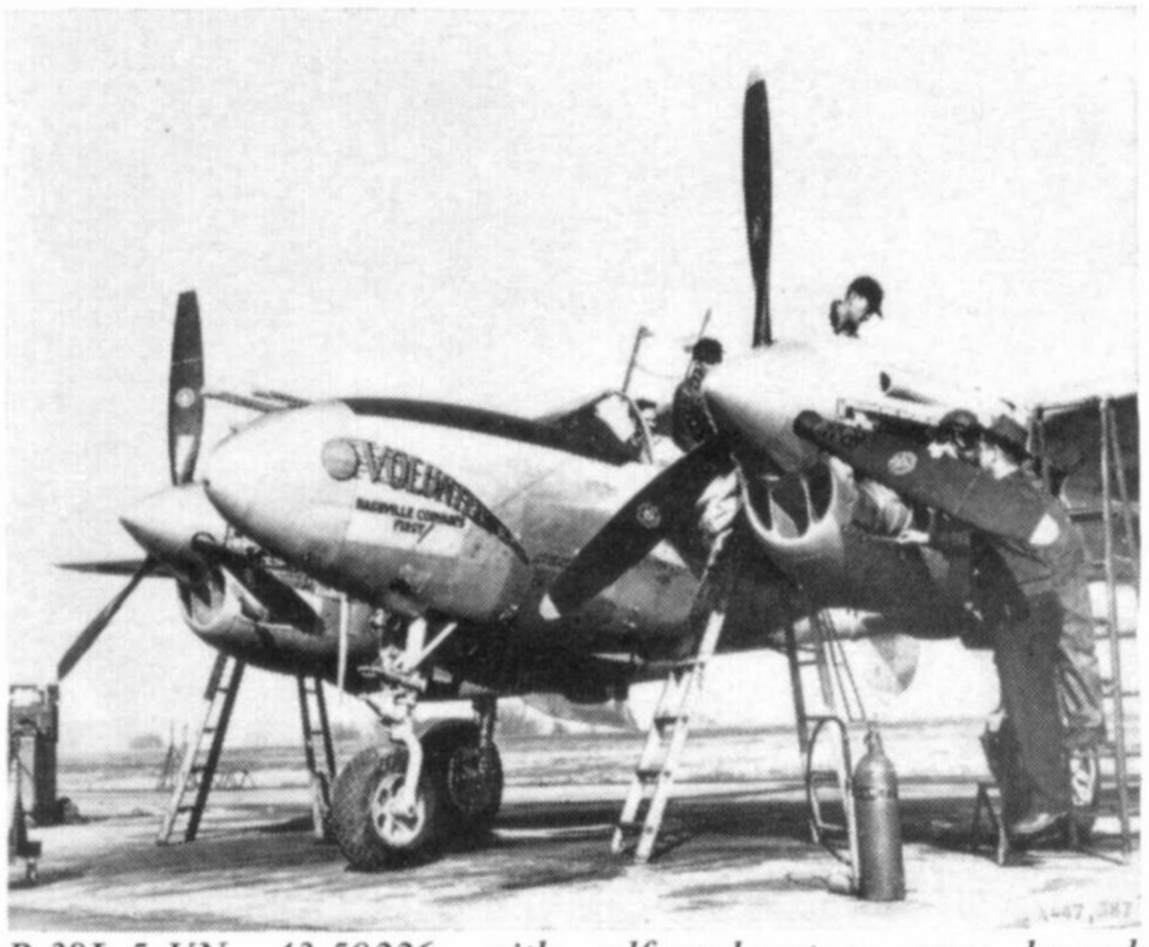
Was the P-38 a good airplane ? Certainly ! Why then was it constantly a centre of controversy ? Let us examine the record and try to separate the facts from the fiction.

The function of a fighter is to place its firepower in a position from which it can destroy the enemy. In so doing, it should expose itself as little as possible to enemy fire power, protect its pilot and return him to his base to fight again. In this respect the P-38 was truly an outstanding fighter. Though the P-38 proved effective in many rôles, it achieved its ultimate effectiveness as an escort fighter. As we examine the rôle of the P-38, we must be aware of the fact that one bomb dropped in the right place can destroy more enemy aircraft (or other material needed to wage war) than any fighter could destroy in aerial combat. The P-38's ability to protect its bombers was outstanding. Its very long range permitted it to escort bombers over distant targets in the E.T.O. as well as on the extremely long over-water flights in the South West Pacific areas. It enjoyed a formidable reputation in German and Japanese air force circles. The Germans dubbed it *Der Gabelschwanz Teufel*— "the fork-tailed devil", while the Japanese pictograph represented "two planes, one pilot". Many times enemy aircraft failed to attack bomber formations which were escorted by P-38's, a fact which helps to account for the great affection of the bomber crews for the P-38.

The P-38 was the only U.S. aircraft in production when war was declared by the United States, which was still being produced (though it was in fact in a termination stage of production) when the war ended. It has to its credit a long list of accomplishments. It was the first *modern* fighter equipped with a tricycle landing gear; the first to use the Allison engine; the first equipped with turbo-superchargers; the first in the "above 400 m.p.h." class; the first successful twin boom design; the first twin-engine interceptor fighter; the first American plane to use butt-jointed flush riveted external surfaces; the first *modern* fighter to mount its guns ahead of the pilot where they can fire straight ahead thus bringing its total fire power to bear on any target within the range of its guns; the first to make extensive use of stainless steel; the first to be delivered to overseas bases under its



Fine study of a P-38J-10-LO in flight; note elevator balance detail, and also the great degree of pilot visibility afforded by the canopy design. In this respect the P-38 was a year and a half ahead of its time; clear-view hoods did not become the rule for single-engined fighters until 1944. (Photo: Lockheed)



P-38L-5-VN, 43-50226, with self-explanatory nose legend; "Nashville Convair's First". (Photo: U.S.A.F.)

own power. The P-38 also used a type of bubble canopy right from the start, while most other fighters underwent extensive modifications to incorporate this high visibility feature which combat proved to be so important.

DESIGN DEVELOPMENT

The P-38J series saw the mid-point of P-38 production. Much experience in combat led to a number of modifications which were incorporated into the J variants. Once an aircraft is flown the modification process begins. At Lockheed this was referred to as "Imagineering". Literally thousands of ideas were examined. Many were experimented with; some leading to very successful modifications. Some became new types of planes such as the F-4 and F-5 photo reconnaissance versions and the P-38M night fighter version. Others helped to improve its performance and fighting efficiency.

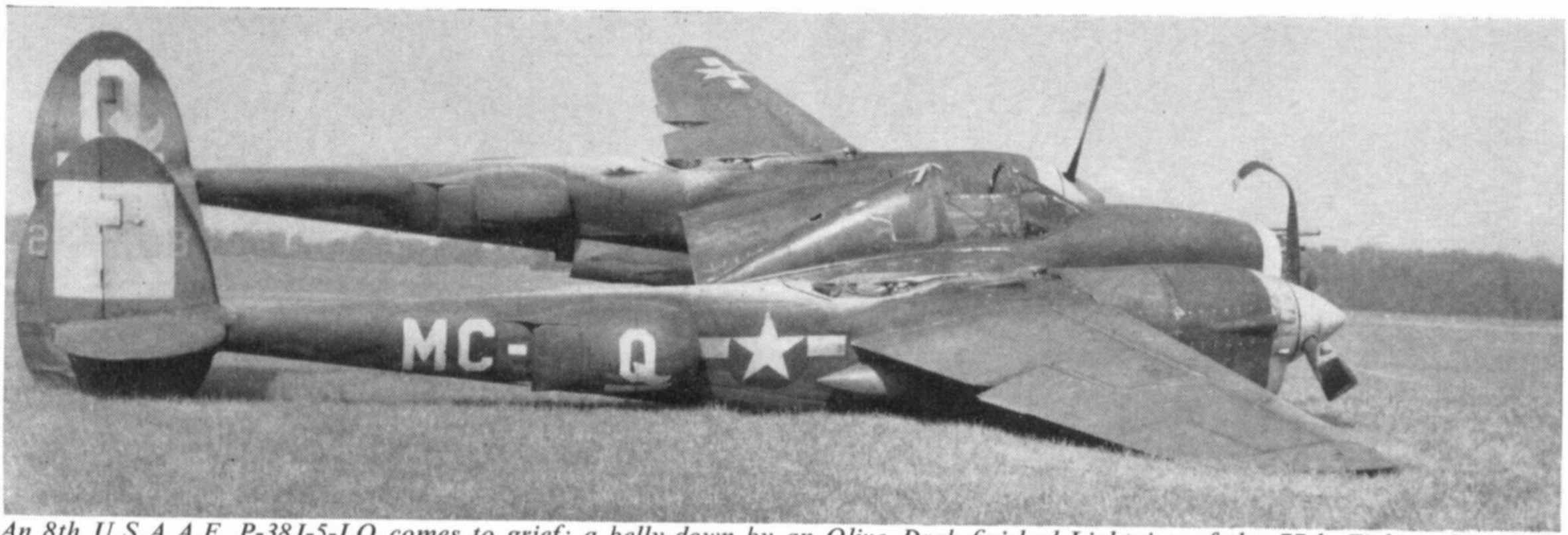
Modifications to fighters are undertaken to accomplish several goals. First of all any aerodynamic deficiencies must be eliminated, then steps to increase its effectiveness are in order. British combat experience in W.W.II led to a number of changes in the P-38; the installation of armour and self-sealing fuel cells were among the first. Other goals were to increase the efficiency of its pilot by making him more comfortable, reducing the attention required to fly and fight through more automatic controls; improve its ability to remain in combat-ready condition by easier maintenance and repair procedures.

The aerodynamic shape of the P-38, with some small but important exceptions, remained constant throughout its entire production life.

Early in its life the P-38 earned a reputation as a pilot killer; a terminal velocity dive was believed to be a fatal manoeuvre. It was possible in a dive to overstress the plane while trying to effect a pull-out; and a number of P-38's lost empennages. This bad reputation was earned by the P-38 because it was the pioneer in the speed ranges in which the effects of compressibility were encountered. It was later learned that all aircraft had problems when they were operated in the compressibility speed ranges. As speeds built up, the effects of compressibility caused a rearward shift in the aerodynamic centre of lift which made recovery from a high speed dive most difficult.

The most obvious effect of high speeds in the P-38 showed up as tail flutter, which was at first believed to be caused by turbulence from the wing. Two "E" types were modified in the search for a suitable solution. One (A.A.F. 42-1986) raised the entire empennage about 30 inches by bending the booms upward aft of the coolant radiators. The modification had little beneficial effect; test pilot Ralph Virden was killed in the crash of this plane. A second plane (A.A.F. 41-2048) was modified to carry a second crew member to monitor the special instrumentation with which the aircraft was equipped. The changed shape of the fuselage, which was extended 30 inches further

The unusual stage of P-38 production—an L-5-LO variant takes its night drive through the streets of Burbank, California, to the Lockheed Air Terminal. (Photo: Lockheed)



An 8th U.S.A.A.F. P-38J-5-LO comes to grief; a belly-down by an Olive Drab-finished Lightning of the 77th Fighter Squadron, 20th Fighter Group.
(Photo: U.S.A.F.)

forward than normal and 76 inches aft of the wing trailing edge, did gain good results. Tony LeVier credits this plane, nicknamed "Nosey" as being "the best diving P-38 I ever flew".

The eventual flutter correction, worked out by C. L. "Kelley" Johnson, designer of the P-38, involved a change of incidence of the entire empennage from —1° 15′ to 0° 0′, and the addition of new fillets at the fuselage-wing leading edge junction. The rearward shift of the centre of lift during high speed dives was solved by the development of electrically operated dive flaps located on the under-wing surface outboard of the booms and just aft of the main beam. A button on the control wheel activated the flaps during a dive. Dive flaps were installed on P-38J-25-L0 and later aircraft.

The P-38J reflected the first major change in the appearance of the P-38 series.

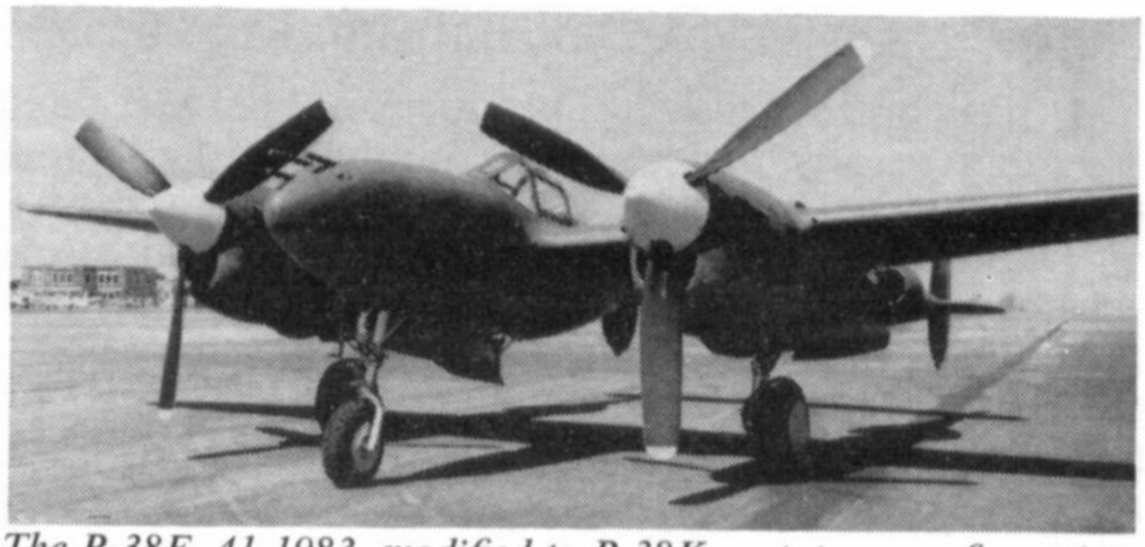
THE P-38J MODEL

Earlier P-38's passed the compressed air from the turbo superchargers through the leading edge of the wing from boom to wing tip and back in order to cool it before it entered the carburettor. There were several problems encountered in this arrangement. The difficulty of controlling the superchargers caused frequent engine back-fires, some of which actually caused changes in the shape of the wing leading edge. The large area of the wing intercoolers also was vulnerable to gunfire. In the J models and later, the intercooler was changed to a core-type radiator located below the engine. It took cooling air through the central duct behind the propeller and exhausted it through a controllable exit flap, thus permitting a considerable amount of control over the temperature of the air entering the carburettor. The removal of the intercooler from the leading edge of the wing allowed the installation of additional self-sealing fuel cells to the outer wing panels. This change was not accomplished without difficulty, however. Modifications, including addition of stiffeners, were required to prevent deformation of the new leading edge.

The beautiful streamlined engine cowling of the earlier P-38's was now replaced by the deep "chin"-type cowling of the later models. Considerable attention was given to boundary-layer control. The leading edges of the coolant radiator cowlings, which were much larger than in earlier models, and the turbo bearing cooling air intakes, were treated to pass the boundary layer air behind the duct intakes. This improved the flow of air through the ducts and helped reduce aero-dynamic drag.

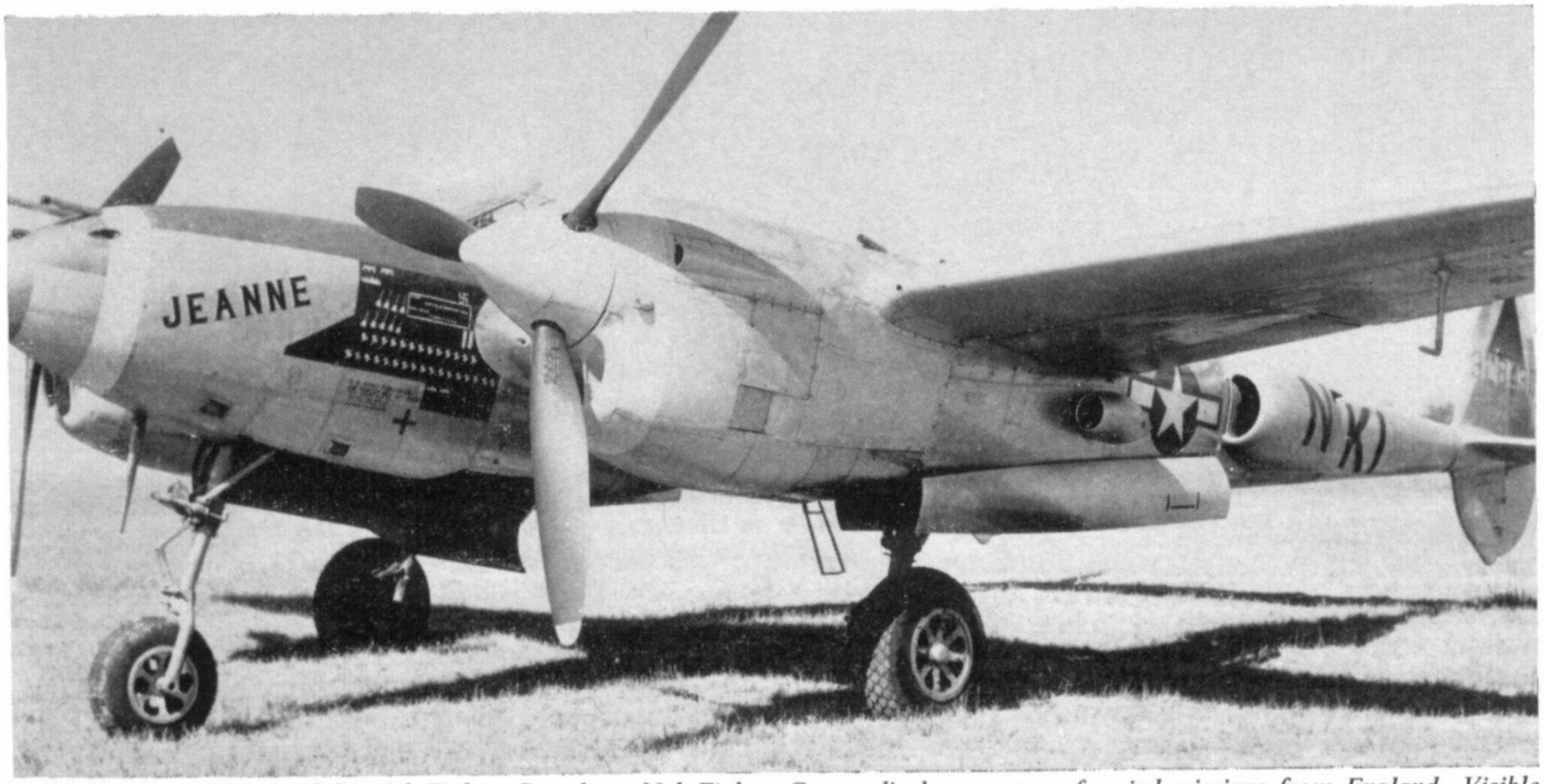
It is interesting to note that drag analysis testing in the full scale NACA wind tunnel at Moffit Field, California, revealed that in the model tested (YP-38) considerably over half the drag of the entire plane was caused by the coolant radiators. The NACA recommendation, chin-type radiators in the wing leading edge, such as used by the de Havilland Mosquito, was never carried out, due no doubt to the difficulty in maintaining the location of the centre of gravity.

Numerous changes for improved efficiency were made in the cockpit area. The bullet-proof glass panel was incorporated into the windshield. The plastic areas aft of the pilot were made easily removable by the use of Dzus buttons, to improve ease of maintenance of the radio gear which formerly required removal of a large piece of armour plate before access to the radio gear could be achieved. Additional



The P-38E, 41-1983, modified to P-38K prototype configuration.
(Photo: Lockheed)

An armourer works on a natural-metal finish P-38L-1-LO of the 77th Fighter Squadron on an English airfield in the winter of 1943-4. Note excellent accessibility of the armament bay.
(Photo: U.S.A.F.)



P-38J-15-LO, 43-28430, of the 55th Fighter Squadron, 20th Fighter Group, displays a score of varied missions from England. Visible are the symbols of one enemy aircraft destroyed (swastika); two locomotives; one torpedo boat; nine fighter sweeps; two bombing raids; and no less than thirty top-cover escort sorties. (Photo: U.S.A.F.)

heating devices were installed, as well as more efficient defrosting equipment. The manual gun charger-selector was removed, (the guns were now charged on the ground) and a new control wheel was fitted. Changes in the electrical system improved the pilot's ability to overcome difficulties by replacing many fuses with circuit breakers, the re-set buttons of which were accessible in flight. The introduction of the hydraulic aileron booster system in the P-38J-25-L0 models vastly improved the roll rate and thereby increased the effectiveness of the P-38 in combat. The pilot-controlled aileron trim tab was removed at this time.

A mechanized moving production line for final assembly greatly increased the output of the J and later models. The use of a major modification centre at Dallas, Texas, and several smaller modification centres overseas, increased the efficiency of the Burbank production line, eliminating the great confusion caused by limited production runs of specialized types such as the F-4 and F-5 (photo reconnaissance) modifications. A rate of 432 P-38's per month was reached in January, 1945, a remarkable figure for a complex plane which had not been designed for high volume production.

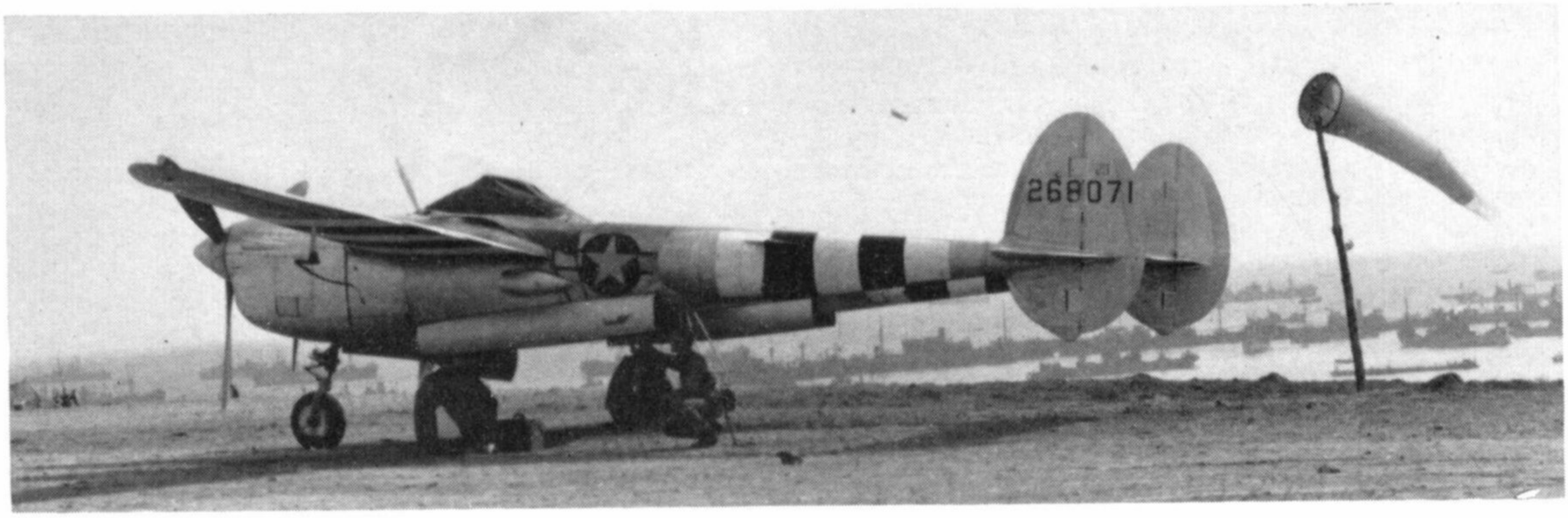
The use of many sub-contractors permitted dispersal of much of the productive facilities for the P-38. Twenty-two major sub-contractors were involved. One, Consolidated-Vultee, which produced the centre section of the wing, actually produced completed aircraft under contract DA-W-33-038AC 760.

The first ten J models were built in the experimental shops at Burbank under contract W535 AC 21217. Also developed at the same time under this contract were the P-38K-1 and the F-5A-1 and -3 photo reconnaissance types.

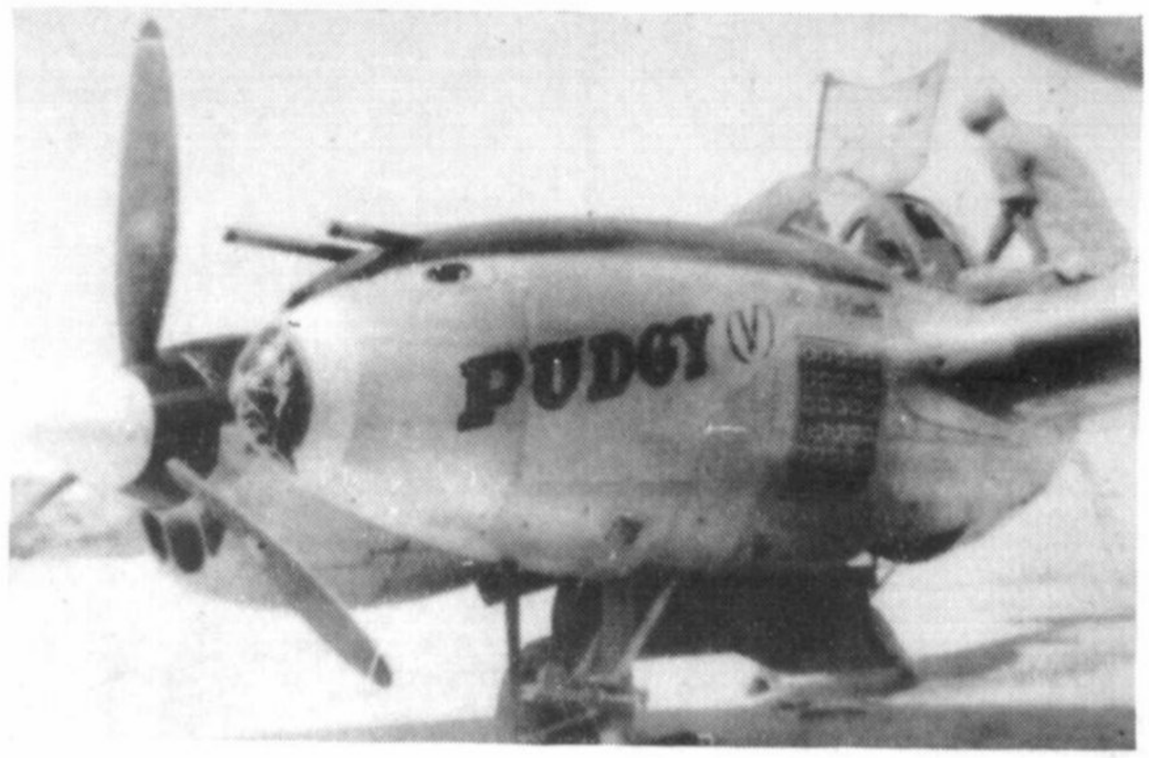
The first 220 J's did not have the flat bulletproof windshield of later models, which first appeared on the P-38J-10-L0.

The P-38J's completed quite a journey before finally taking to the air. As mentioned above, the wing centre-section was produced by Consolidated-Vultee at Nashville, Tennessee; the fuselage was built in metropolitan Los Angeles; and the other components came from sub-contractors scattered all over the United States. Final assembly took place in Plant A-1 at Burbank. The next stage of the trip took

The first Lightning to land on an advance American airstrip in France after D-Day; a P-38J-10-LO of the 9th Air Force. (Photo: M.A.T.S.)



Ace of Lightning aces—Maj. Richard I. Bong poses by his P-38J-20-LO, displaying 40 victories. (Photo: M.A.T.S.)



Two rare photographs of Pudgy V, *the P-38L of Major Thomas B. McGuire, second ranking U.S. ace of the war. Upper view shows face painted on tip of nose, 25 victory flags, as at Boroka Strip in Dutch New Guinea, October 1944. Lower view shows the aircraft with McGuire's final score of 38 victories, and was taken at Dulag in the Philippines shortly before his death. He was awarded a posthumous Congressional Medal of Honor, America's highest decoration.* (Photos: via Bob Anderson)

the aircraft across to the paint shop and the "cotton-shed" for additional detailing and preparation for the next leg, a unique journey through the streets of Burbank. Each P-38 was towed by a tractor, late at night to avoid traffic, from Plant A-1 to Lockheed Air Terminal (a distance of about six city blocks) where final flight preparations were made; and each aircraft was then test-flown before delivery to the Army Air Force.

THE P-38K

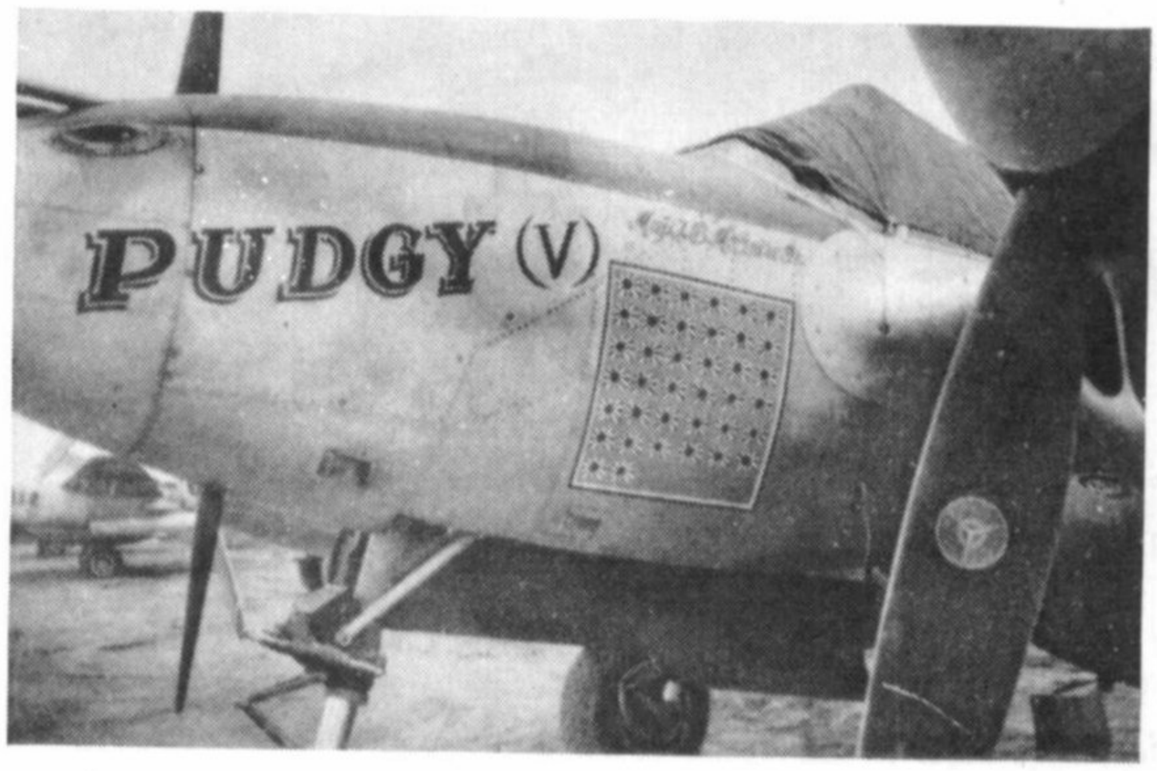
The P-38K was an improved model similar to the P-38J-1. It used V-710-89 and 91 engines and A.A.F. records indicate a 12′ 6″ diameter propeller was used. Serial A.A.F. 42-13558 was assigned to the P-38K, however the photograph supplied by Lockheed and identified as the "prototype P-38K" by Kelley Johnson, shows a modified P-38E (41-1983). The propeller does not seem to be greater in diameter than normal though it is considerably broader than "standard". Information in the author's hands indicates that the engine thrust line was one inch higher than the J and the oil cooler duct openings in the engine cowl were divided horizontally—the upper portion of which was used to duct cooling air to the spark plugs.

THE P-38L-1

The installation of the Allison V1710-111 and 113 engines (with a War Emergency rating of 1,600 h.p.) constituted the major difference between the P-38J-25-L0 and the P-38L-1-L0. A total of 1,290 P-38L-1-L0's were produced under contract AC 40040 while the first P-38L-1-L0 was produced under AC 21217. (The same contract called for development of the P-38J and P-38K). The P-38L went into production when the P-38K proved to be little better in performance than the J model and the engines used (V1710-75 and 77) proved to be in short supply. Five hundred P-38L-1-L0's were modified to F-5E-4-L0 at the Dallas modification centres. The installation of a landing light in the leading edge of the left wing, replacing the retractable light of the earlier series, is the most easily noticed change in external appearange from the P-38J's.

THE P-38L-5-L0

The L-5 series was the same as the L-1 series except for tank mounted fuel booster pumps which were



housed in small fairings on the bottom of the wing. The droppable fuel tanks were pressurized on the L-5.

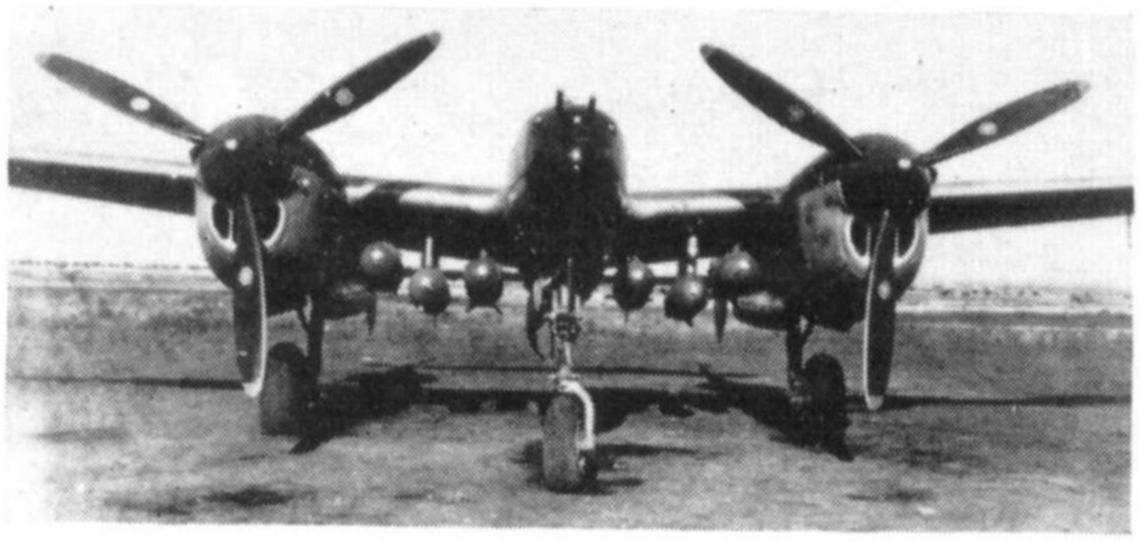
The L-5 series provided a considerable number of aircraft for modification to other types. All F-5F and F-5G photo reconnaissance planes were modified at Dallas, as were all P-38M's. Normal A.A.F. records show 75 P-38M-L0's were converted. No record of F-5F and F-5G conversions has been located to date, nor has a list of the converted aircraft serial numbers been located. The result is that all P-38M, F-5F and F-5G aircraft bear serials that A.A.F. records show assigned to P-38L-5-L0 aircraft, as all those planes were actually completed as L-5's and were then flown to Dallas for modification.

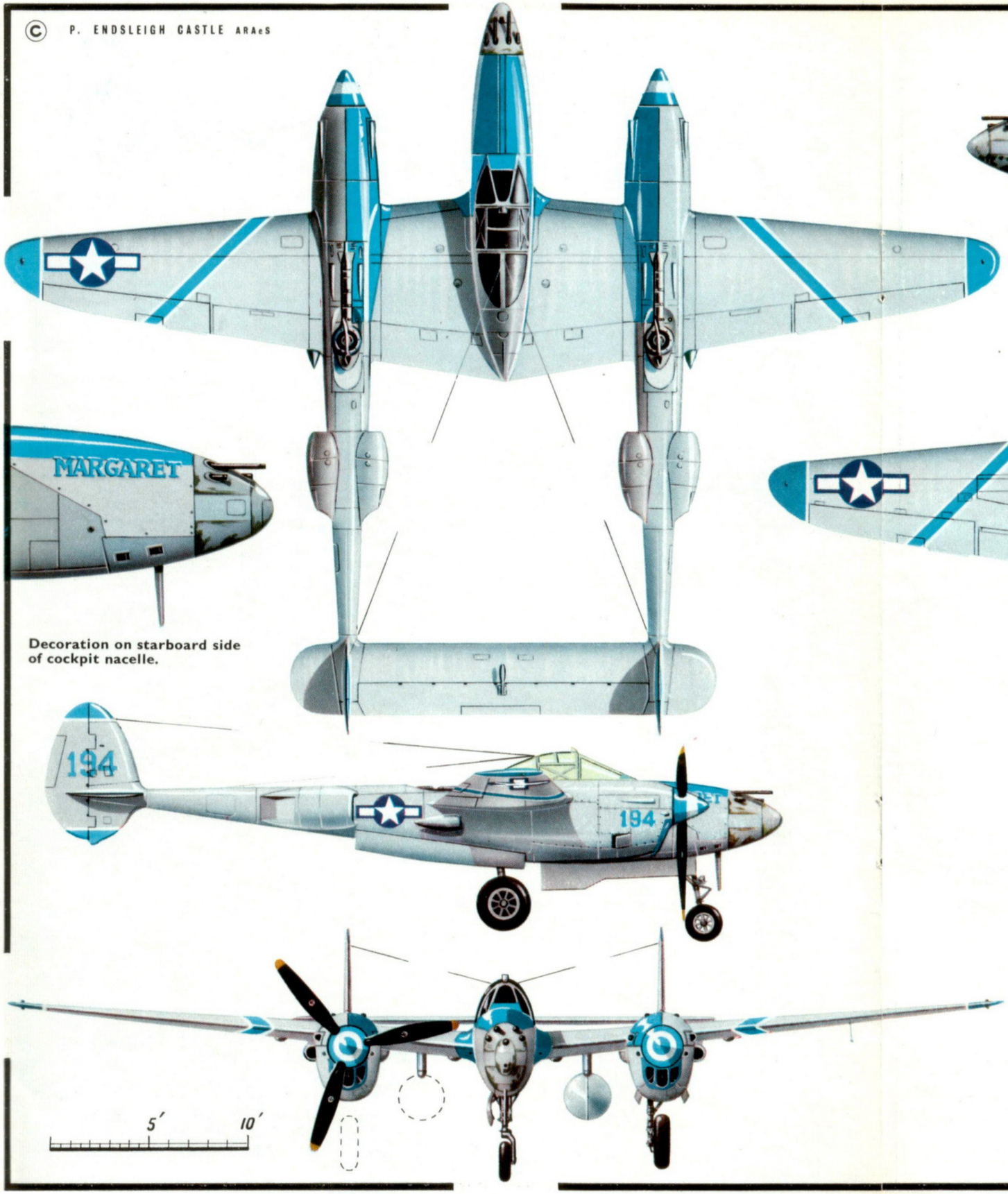
THE P-38L-5-VN

Few people know that P-38's were also built by

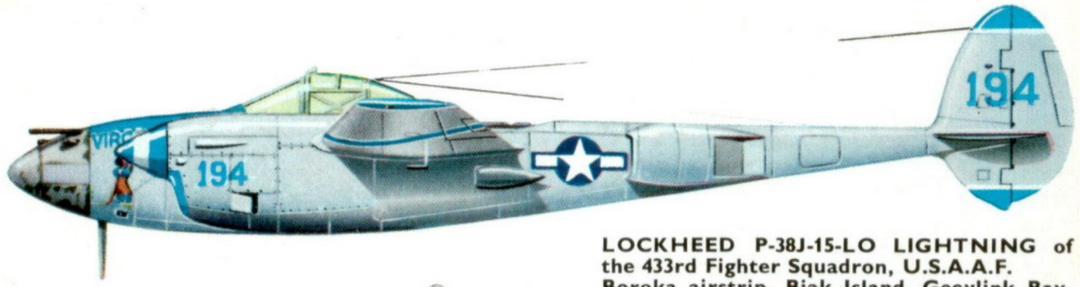
(*continued on page 10*)

P-38 in Italy, with underwing bomb load. (Photo: Lockheed)

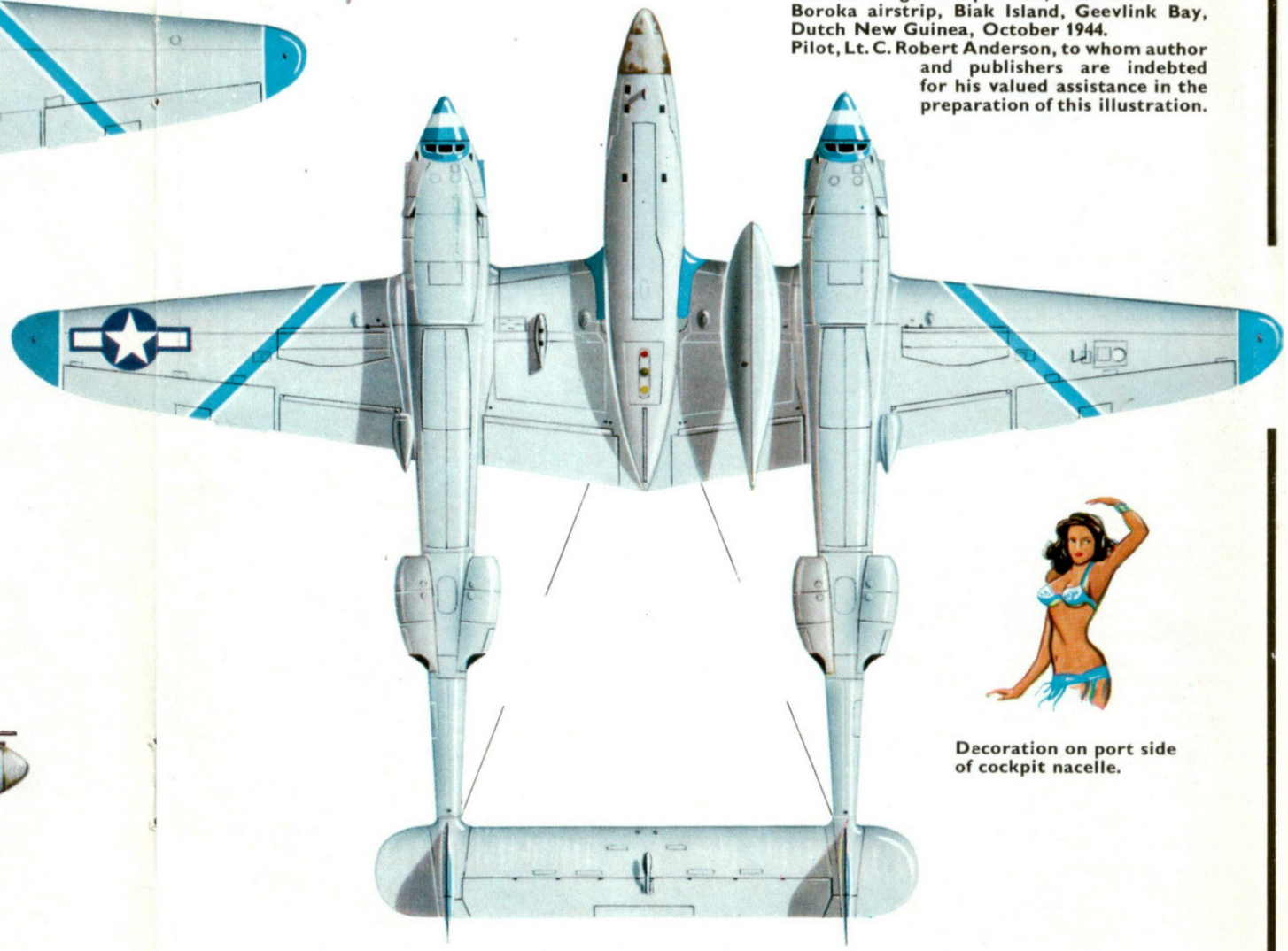




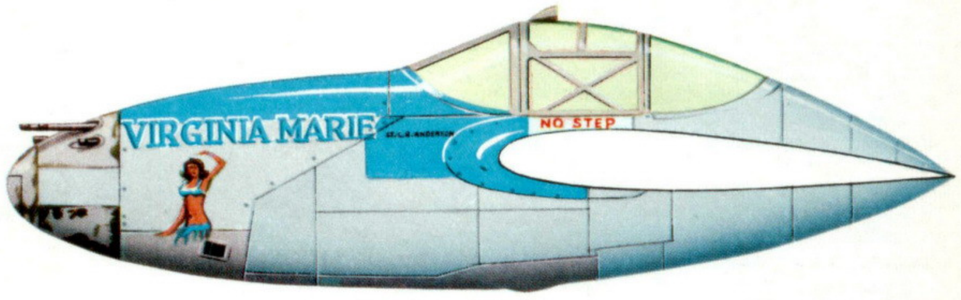
Decoration on starboard side of cockpit nacelle.

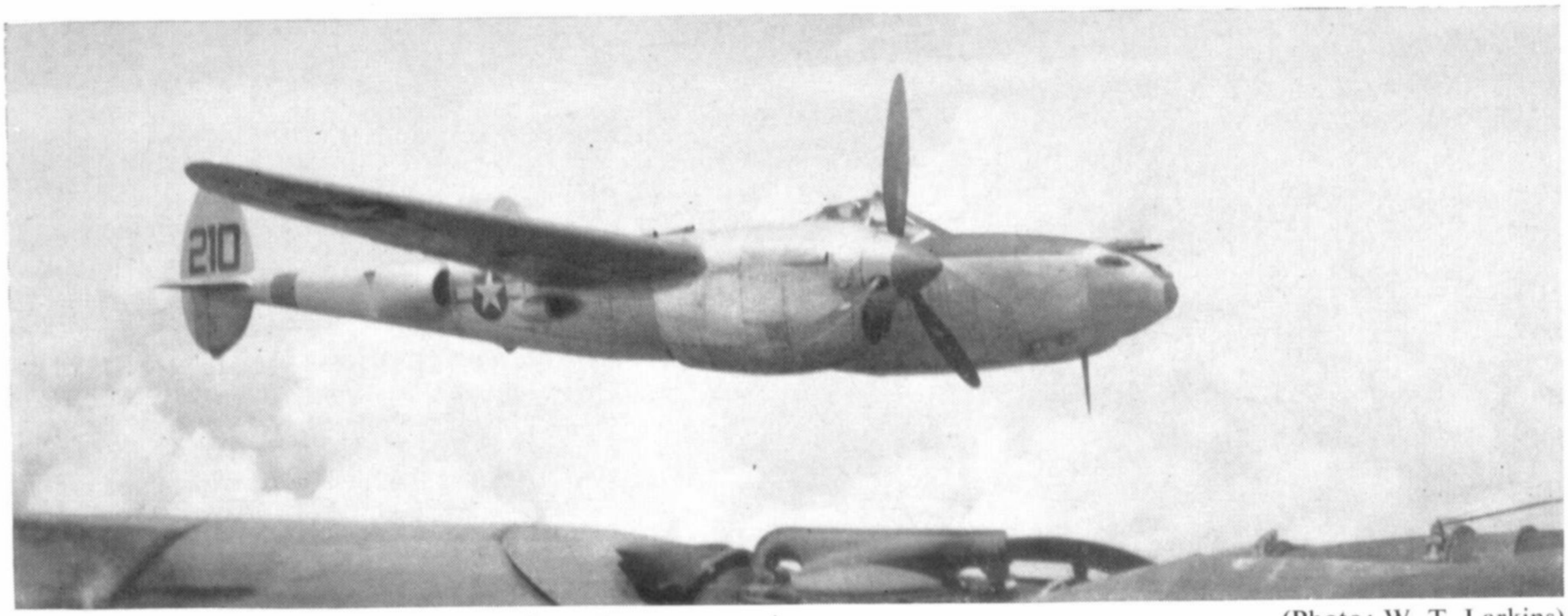


LOCKHEED P-38J-15-LO LIGHTNING of the 433rd Fighter Squadron, U.S.A.A.F. Boroka airstrip, Biak Island, Geevlink Bay, Dutch New Guinea, October 1944.
Pilot, Lt. C. Robert Anderson, to whom author and publishers are indebted for his valued assistance in the preparation of this illustration.



Decoration on port side of cockpit nacelle.





A 13th Air Force P-38L-5-LO maintaining formation on one engine. (Photo: W. T. Larkins)

Convair. Contract DA-W033-038-AC760 called for delivery of 2,000 P-38L type aircraft. A total of 113 P-38L-5-VN's were accepted by the A.A.F. and the rest were cancelled when production of the P-80 jet fighter began to become significant.

Convair had long been participating, as a sub-contractor, in the construction of P-38's. They were responsible for the wing centre section structure; production was undertaken at Convair's plant at Nashville, Tennessee.

THE P-38M

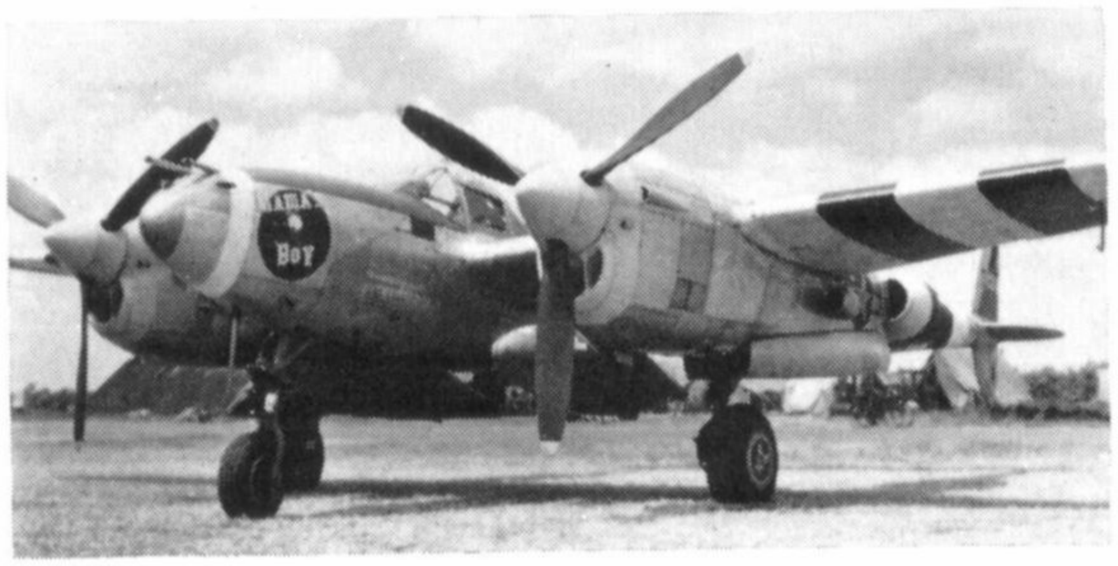
The need for night fighters throughout the War, plus the success of the modification permitting the P-38 to carry a second crewman, led to the development of the P-38M night fighter variant. The P-38L-5-L0 was modified to carry a radar operator seated above the wing centre section behind the pilot. The radar unit, employing "bomb" type A.S.H. equipment, was carried on a bomb release directly under the nose. Flash eliminators were fitted to all guns, mainly to aid the pilot in retaining night vision. Experiments were conducted with the object of shielding the turbo-supercharger exhaust, but experience soon showed that the entire exhaust system achieved such temperatures that it glowed at night, making the small reduction of visibility possible with shielding of the actual eflux relatively pointless. No modifications of the exhaust system was undertaken on "production" P-38M's; seventy-five examples of the type were converted from the P-38L-5-L0 and some saw combat in the closing stages of the Pacific war.

ARMAMENT OF THE P-38

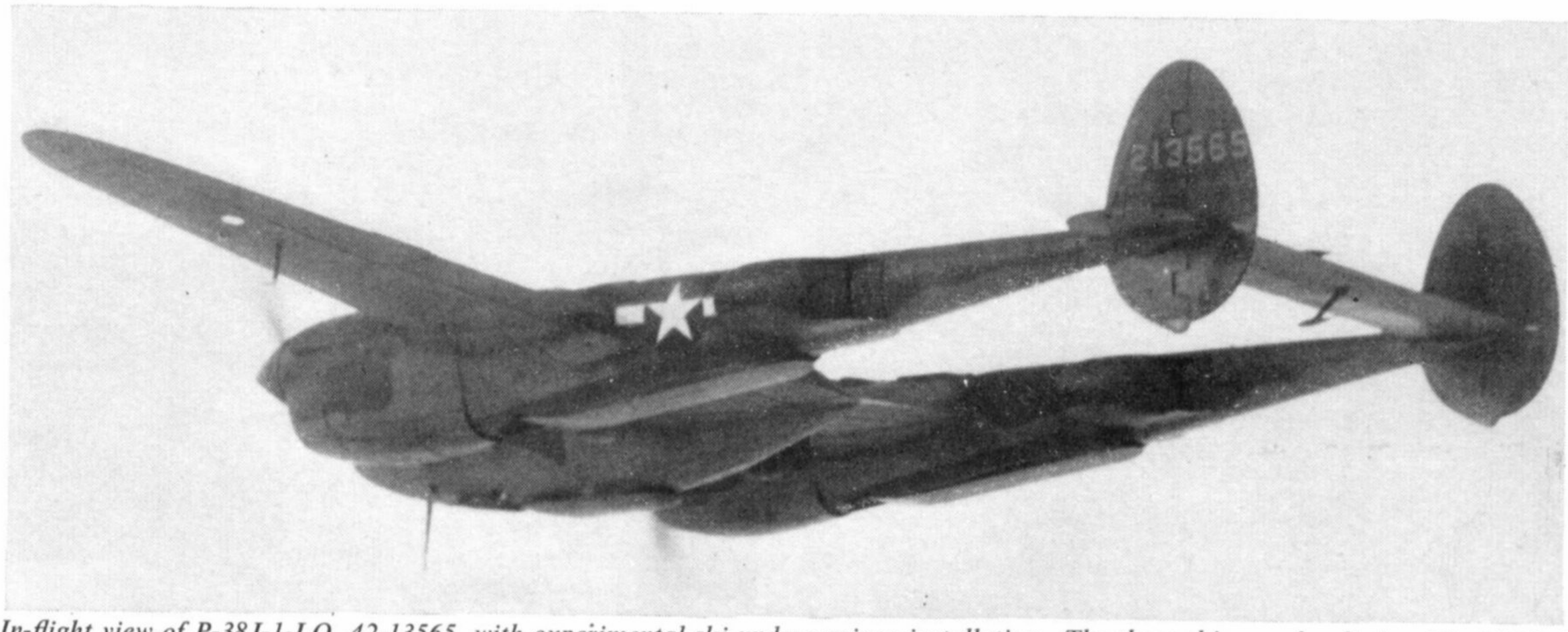
While the armament of the P-38 was soon standardized at one 20 mm. AN-M2 cannon, and four ·50 cal. M2 machine guns (P-38E and all subsequent models), the search for increased firepower continued throughout its entire life. A number of interesting ideas were investigated and some were actually produced.

Increasing engine power greatly increased the load-carrying ability of each successive model. One of the most significant developments was the pylon from which, initially, jettisonable fuel tanks were suspended. The pylon, of laminar flow cross-section, was mounted directly on the main spar beneath the wing between the fuselage and the boom, and featured an Interstate bomb release plus folding brackets from which a bomb hoist could be hung. The pylon was soon put to many uses other than the carrying of fuel tanks. It was found that bombs could be effectively delivered at short ranges; in the E.T.O. this led to the development of the horizontal bombing technique for P-38's. Formations of bomb-carrying P-38's were accompanied by "Pathfinder" P-38 conversions which located the target and determined the formation's bomb release point. Two specially modified types were developed for the "Pathfinder" rôle; one used a transparent bombardier-nose with Norden bomb sight, and a later variant used a radar bomb sight permitting attacks through cloud cover. Modification centres in both England and India prepared these versions.

P-38L-1-LO in Chinese markings for Project "Bird". (Photo: Lockheed)



"Mama's Boy", a P-38J-15-LO (43-28301) of the 55th Ftr. Sqdn., 20th Ftr. Grp., 8th Air Force photographed shortly after D-Day. (Photo: U.S.A.F.)



In-flight view of P-38J-1-LO, 42-13565, with experimental ski undercarriage installation. The three skis can be distinguished folded back under the fuselage and booms.
(Photo: U.S.A.F.)

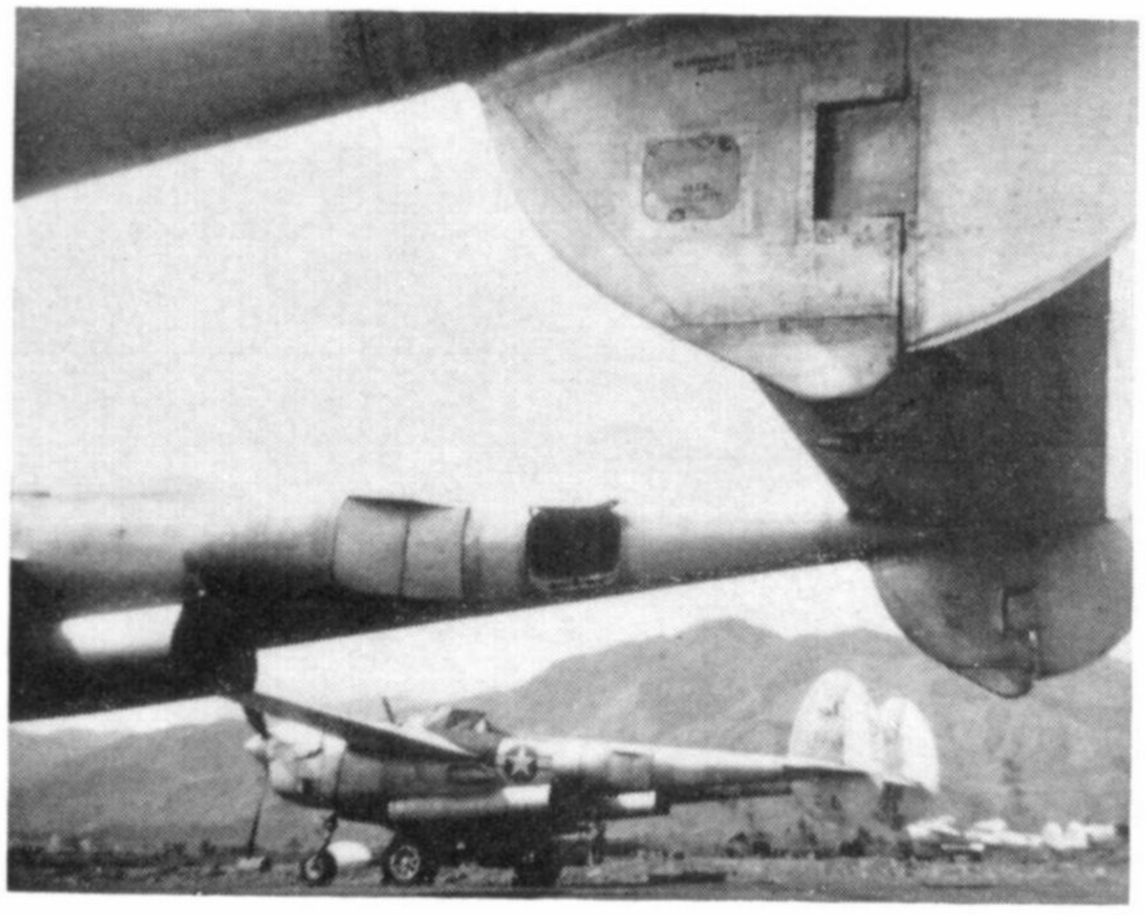
Other underwing ordnance used in combat included incendiary clusters and smoke canisters; and although never used in action, tests of a variant with two aerial torpedoes were concluded with reasonable success.

Several modifications utilizing the 300-gallon fuel tanks fitted with removable after sections permitted the carrying of tools, equipment and maintenance supplies to forward bases when regular transport was not available; and some tanks were even prepared capable of carrying personnel in emergency situations.

Rocket experiments were initiated early in the production life of the P-38. Early installations comprised clusters of long bazooka-type launching tubes, but these were soon abandoned with the introduction of the zero-length launcher. The first example of this installation was mounted on P-38L-1-L0, serial 44-2490; fourteen projectiles were carried. The mounts consisted of fore and aft pylons plus the electrical firing mechanism for each rocket. It is interesting to note that an extra large space had to be left between the third and fourth rocket (inboard to outboard) on the port wing to ensure that the rocket fins cleared the pitot mast; equal spacing was adopted on the starboard wing to balance drag and load forces. Extensive modification of the wing structure was necessary to accommodate the complex mechanism; and later the more easily installed "Christmas Tree" mount became standard on the P-38L-5-L0, requiring only three attachment points and one electrical connection per pylon. Each installation carried five 4-inch or 5-inch rockets. The location on the port wing was critical, allowing only inches of clearance between outboard rocket fins and pitot mast, and between inboard fins and propellor tips.

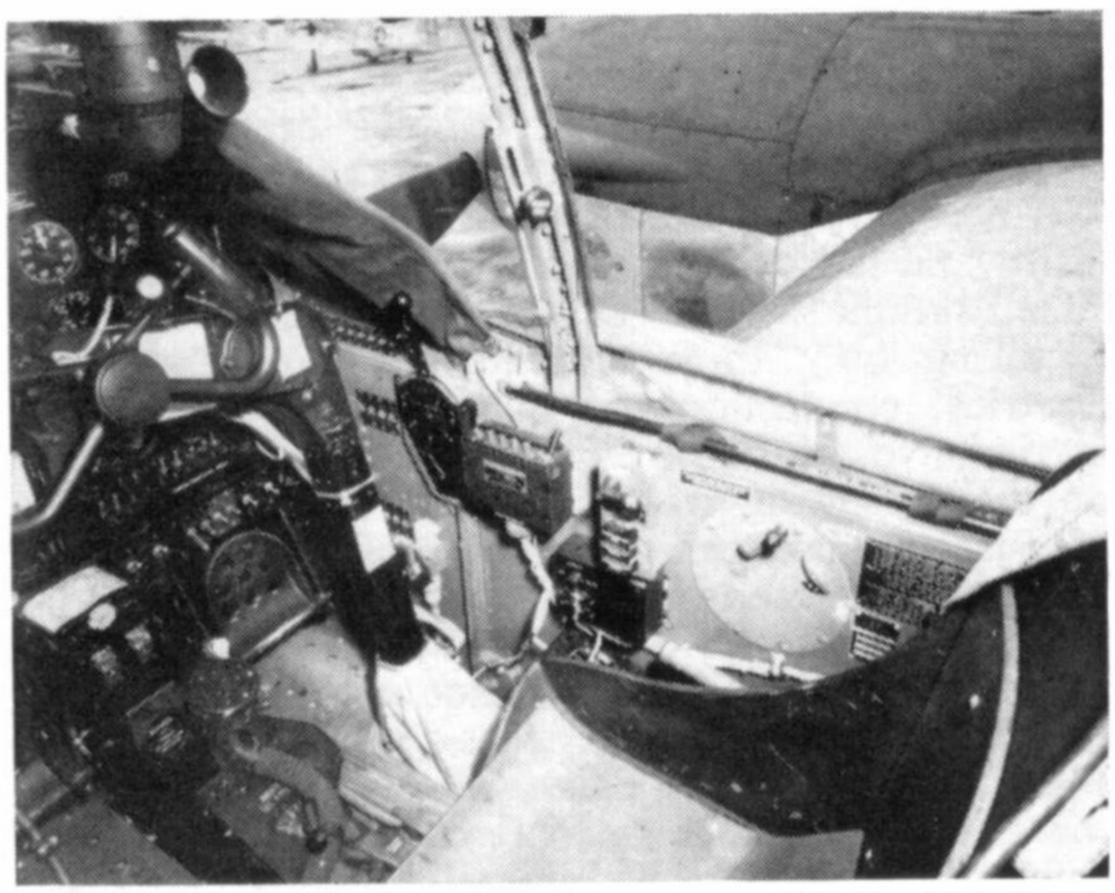
Two interesting armament modifications were conducted at Wright Field. One involved the fitting of three ·60 cal. machine guns to P-38L-1-L0 serial 44-23601; but tests at Eglin A.F.B. in 1946 were not successful. The guns themselves betrayed structural deficiencies, and the shell links frequently failed with either positive or negative acceleration. The other experiment, aimed at producing a specialised ground-strafing version, was the installation of eight ·50 cal.

Left: *P-38J-15's at Nabzab in the Markham Valley, New Guinea; 433rd Ftr. Sqdn. aircraft, the first of this type to arrive in New Guinea. The squadron flew in from Eagle Farms Field near Brisbane, Australia in April 1944, with Richard Bong in command.*
Right: "*Photo Joe*" *F-5 at Mokmer Strip, Biak Island. "Camera Shy" met her end in October 1944 when the squadron commander took the crew chief for a joy-ride, removing radio for passenger space, and crashed in the lagoon at Biak Island during a slow roll.*
(Photos: Bob Anderson)

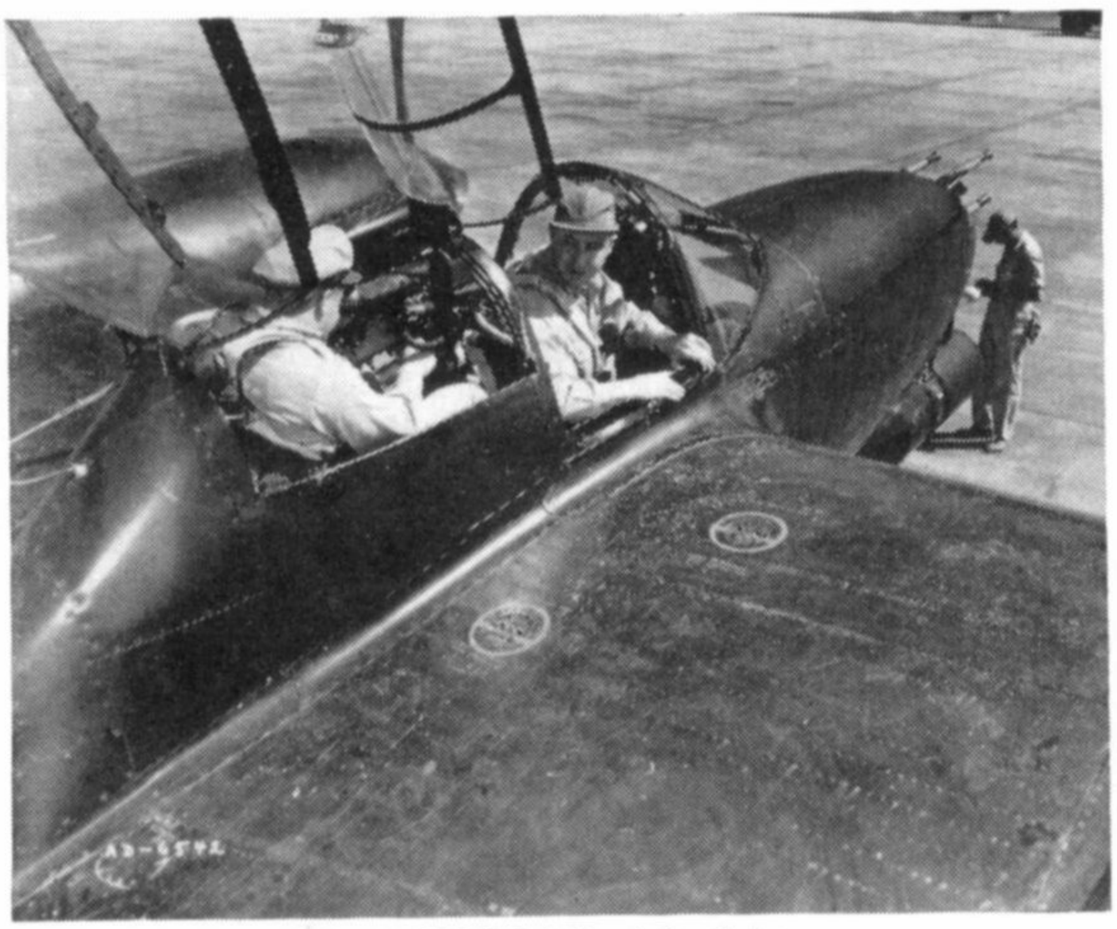


A P-38J "Droop-snoot" with bombardier nose, photographed in England. (Photo: Lockheed)

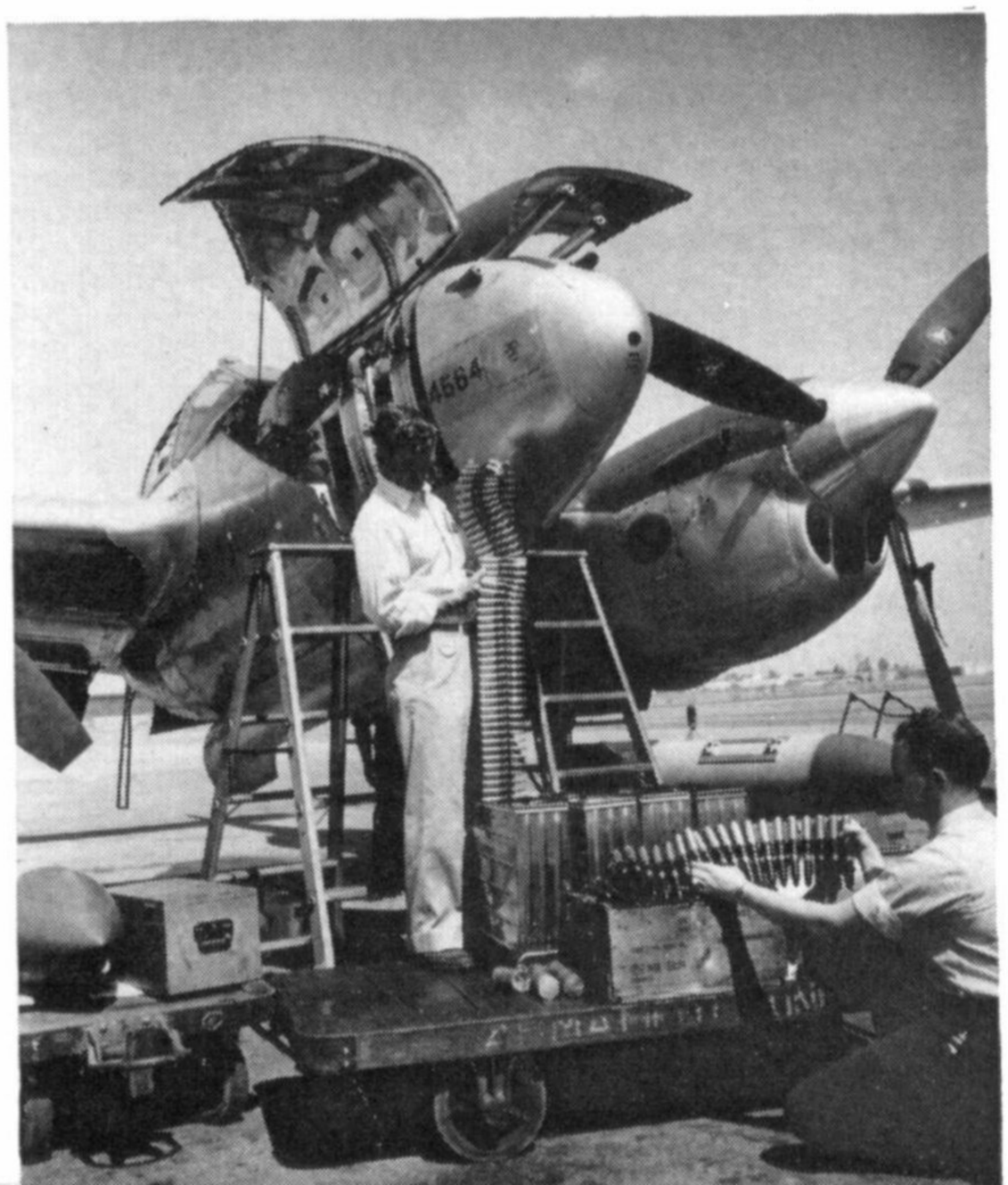
"Night Lightning" (44-26865) the first P-38M night fighter, modified from the P-38L-LO variant. Note A.S.H. radar in "bomb" housing. (Photo: Lockheed)



Cockpit of P-38L-5-LO. (Photo: U.S.A.F.).



Twin cockpits of the P-38M-5-LO night fighter. (Photo: Miller-Lockheed)



Armament bay of P-38L-5-LO. (Photo: U.S.A.F.)

Left: *Ready to load; a P-38L-1-LO.* (Photo: Lockheed)

The experimental installation of three ·60 cal. machine guns in a P-38L. The protruding barrels of the guns can be seen immediately above the fuselage star of the aircraft in the background.
(Photo: W. T. Larkins)

guns in the nose of P-38L-1-L0 serial 44-24649, and the fitting of two pods under the wing, each carrying two further ·50 guns.

OVERSEAS SERVICE

Thirteen Fighter Groups are believed to have operated the P-38 in combat. The reconnaissance variants were used by some ten Photo and Recce. Groups.

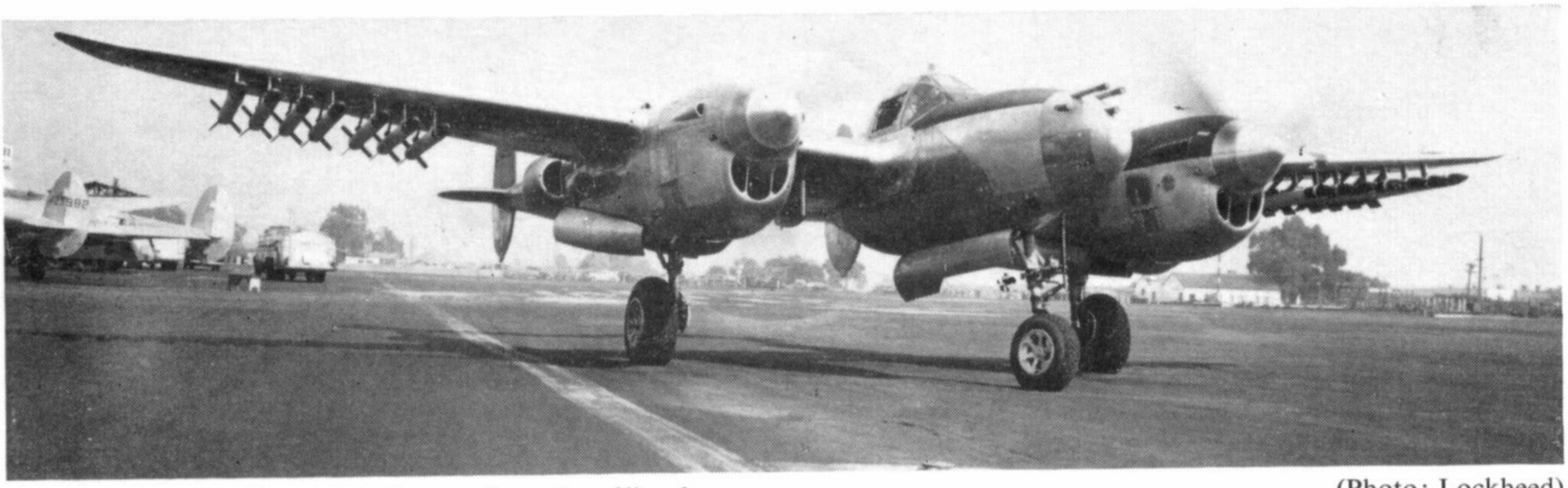
These units include:

8th U.S.A.A.F.

1st Fighter Group 14th Fighter Group (78th Fighter Group)	Rec'd early variants in 1941; temporarily attached to 8th Fighter Command in July/August 1942; moved to N. Africa for Operation Torch, Nov. 1942, after nominal operations from U.K. Part of 78th Ftr. Grp. personnel remustered in U.K. as P-47 pilots.
55th Fighter Group (343rd, 338th, 38th Sqdns.)	Arrived U.K. without a/c in summer 1943; first sortie October 15th, almost certainly with P-38J's, by 36 a/c on fighter sweep over Dutch coast. Converted to P-51's on 14th July 1944.
20th Fighter Group (55th, 77th, 79th Sqdns.)	Aircraft of Grp.'s 79th Sqdn. flew practice sorties with 55th Ftr. Grp. from November 5th 1943; began full Group ops. from 28th December. Converted to P-51's on 17th July 1944.
364th Fighter Group (383rd, 384th, 385th Sqdns.)	Commenced service with 8th A.F. on 3rd March 1944. Took part in initial daylight raids over Berlin. Converted to P-51's on 28th July 1944.
479th Fighter Group (434th, 435th, 436th Sqdns.)	Commenced operations 26th May 1944, took part in pre-invasion offensive. Converted to P-51's 27th September 1944.

All above units took part in escort missions with 8th A.F. B-17's and B-24's. The records indicate mixed success, with numerous engine failures causing more problems than enemy action. It is estimated that every Lightning in England changed its engines at least once during this comparatively brief period. Experienced pilots could handle the aircraft satisfactorily at high altitude but too many of the 8th Fighter Command personnel did not have the length of service and varied training to equip them for flying this temperamentally-powered aircraft in combat.

P-38L-5-LO, 44-25605, rebuilt for General Stratemeyer (note nose insignia) by Hindustan Aircraft in India. VIP features included leather-lined nose, special seat, and built-in thermos jug.
(Photo: Bowers Collection)



A P-38L-1 carrying fourteen rockets on "zero-length" pylons. (Photo: Lockheed)

9th U.S.A.A.F.

367th Fighter Group
370th Fighter Group
474th Fighter Group
10th Reconnaissance Group
67th Reconnaissance Group

These tactical units operated the P-38J and F-5 variants on low-level missions in the E.T.O. It is not known when they first received or finally relinquished this type, but the 474th operated Lightnings until VE-Day. Twin engines and high speed, plus excellent handling at low altitude made the P-38 a first class tactical aircraft, despite the vulnerability of the liquid-cooled engines.

Pacific Theatre

The P-38 was operated in the Pacific by the 8th, 49th, 347th and 475th Fighter Groups. In great demand because of their long range, ideal for escort missions with Army bomber formations over the great areas of ocean, they were often scattered from island to island as individual squadrons. Their most frequent adversary was the Mitsubishi Zero-Sen, which was slower and considerably weaker in armament; the nose guns of the P-38 required more accurate sighting than a wing battery but when hits were achieved the resulting damage to the lightly-built Japanese aircraft was lethal. The great range of the P-38 made nine or ten hour missions almost standard procedure; and it ended the War with a greater number of Japanese aircraft to its credit than any other contemporary Allied type. It was in the P-38J that Richard Bong and Tommy McGuire won their places as the leading aces of the Pacific war.

And it was two Lightnings which became the first Allied aircraft to land on the Japanese Home Islands after the dropping of the atomic bombs on Hiroshima and Nagasaki. On 25th August 1945 Col. Clay Tice and his wingman landed at Nittagahara, Japan, "due to engine difficulties"—a somewhat suspect explanation for this unauthorized stop-over. It was in the Pacific that the P-38 truly came into its own; tactics were evolved which capitalised on its strong points. While no one can deny that its powerplants gave more than their reasonable share of trouble, causing it to be the centre of controversy, equally it cannot be denied that the "fork-tailed devil" made a real contribution to the Allies' final victory.

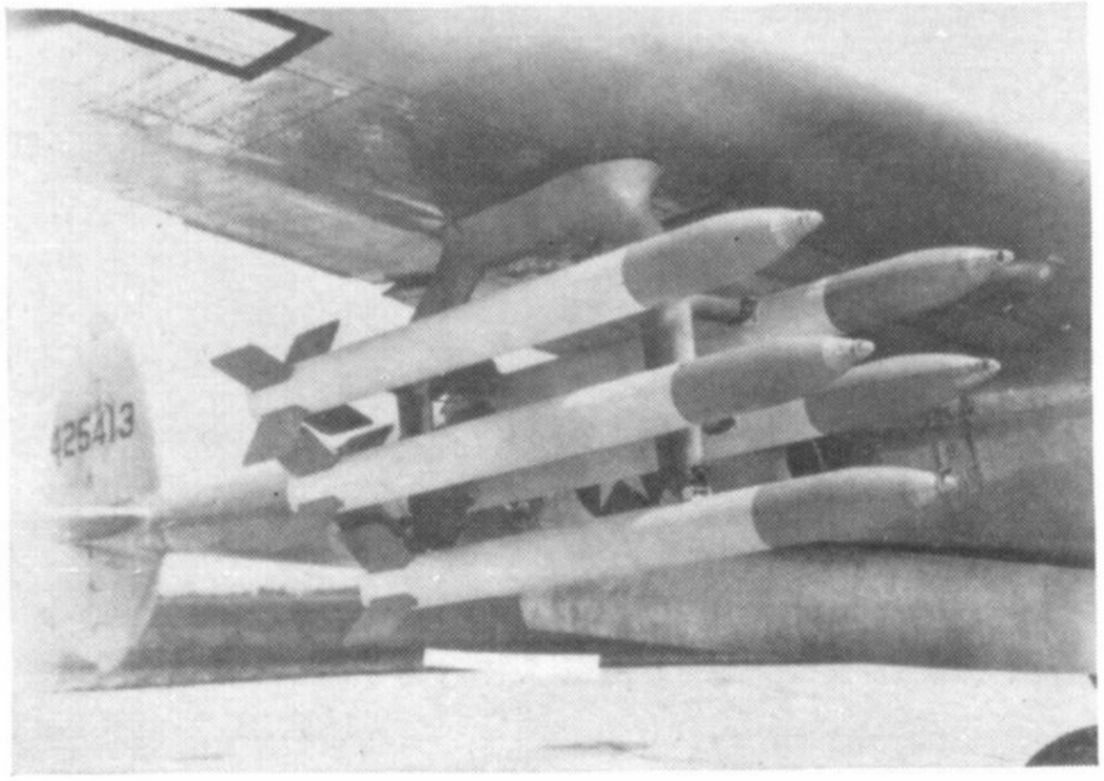
SERIAL BLOCKS

P-38J-1	42-12867-12869: 42-13560-13566
P-38J-5	42-67102-67311
P-38J-10	42-67402-68191
P-38J-15	42-103979-104428: 43-28248-29047: 44-23059-23208
P-38J-20	44-23209-23558
P-38J-25	44-23559-23768
P-38L-1	42-13558: 42-23769-25058
P-38L-5	44-25059-27258: 44-53008-53327
P-38L-5-VN	43-50226-50338

Available details of relevant batches of F/5 aircraft.

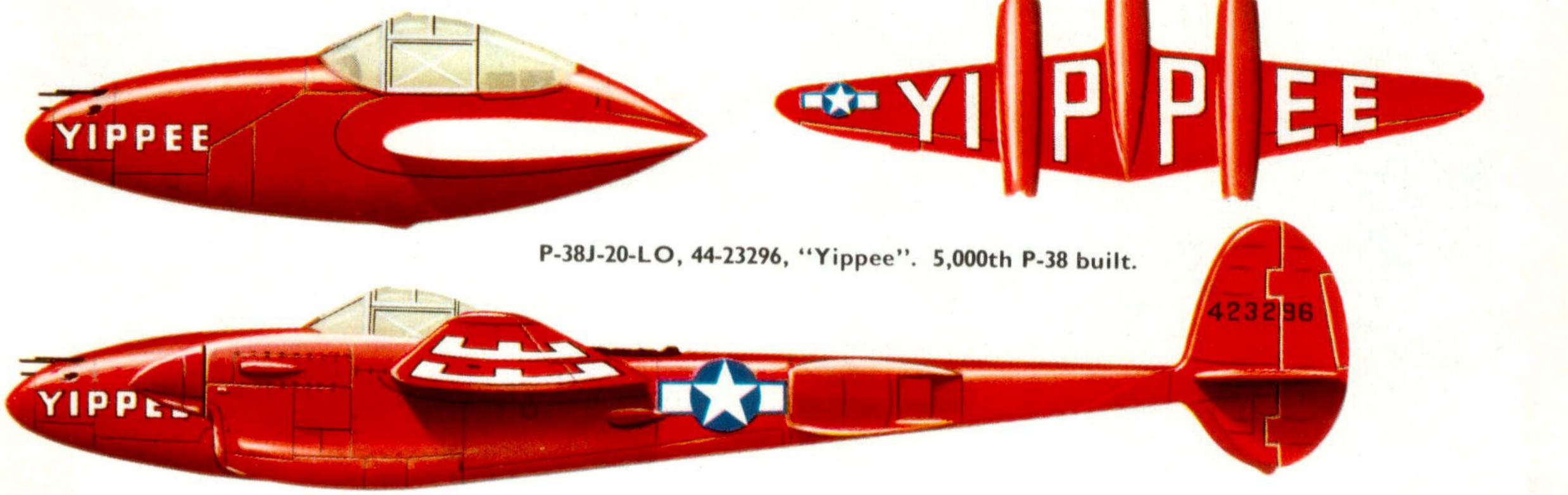
F-5B-1 (P-38J-10)	42-68192-68301
F-5E-2 (P-38J-15)	100 aircraft, serials not known.
F-5E-3 (P-38J-25)	105 aircraft, serials not known.
F-5E-4 (P-38L-1)	508 aircraft, serials not known.

The most successful rocket mounting was the five-projectile "Christmas Tree". (Photo: Lockheed)



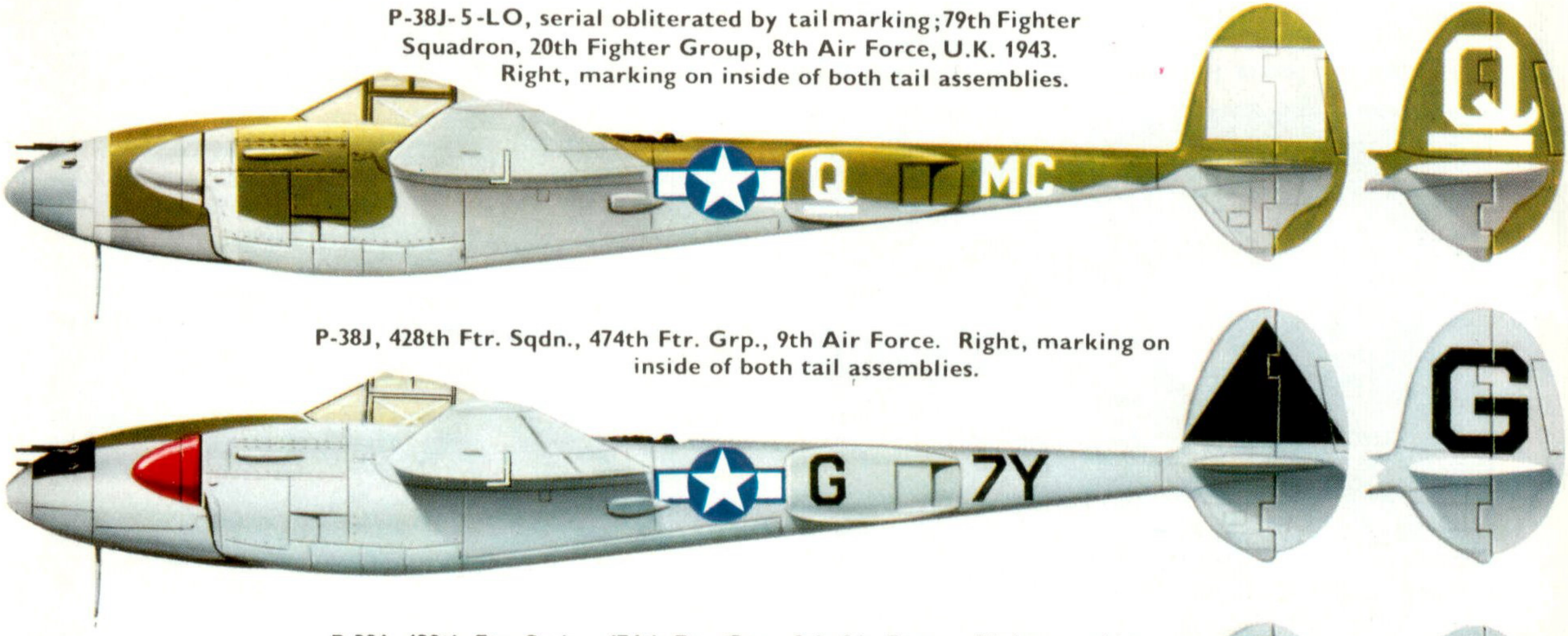
STRUCTURE

Wing: fully cantilever structure consisting of centre section, two outer panels and two wing tips. Main spar, auxiliary rear spar and in centre section only, front spar. Metal outer skin stiffened by spanwise inner corrugated skin; leading edges, integrally stiffened assemblies joined along leading edge with "piano" hinges, housing fuel areas each of 62 U.S. gal. capacity. Main fuel cells aft of spar in centre section, of 90 U.S. gal. capacity each, with reserve tanks of 60 gal. capacity forward of main spar. Fuel tankage, 424 gal. (internal), $+2 \times 150$ gal. drop-tanks, or 2×300 gal. drop-tanks. Fuel systems cross-feeding with exception of leading edge cells. Fuselage nacelle; this accommodated cockpit, armament, and radio equipment. Cockpit canopy consisted of two transparent sliding track-mounted side panels, and



P-38J-20-LO, 44-23296, "Yippee". 5,000th P-38 built.

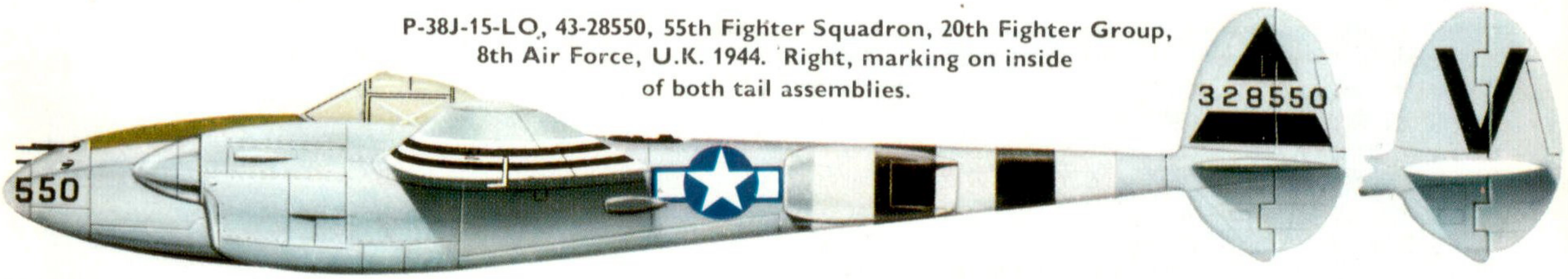
P-38J-5-LO, serial obliterated by tail marking; 79th Fighter Squadron, 20th Fighter Group, 8th Air Force, U.K. 1943. Right, marking on inside of both tail assemblies.



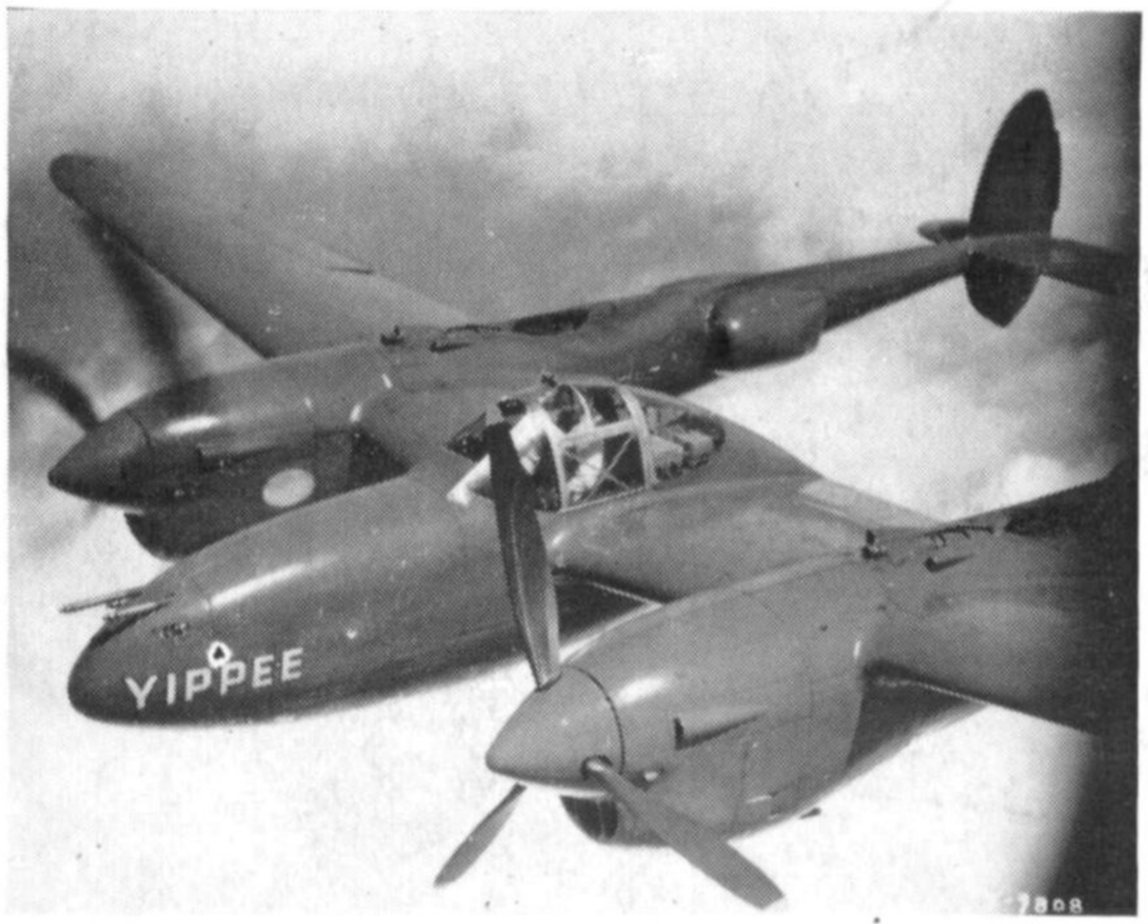
P-38J, 428th Ftr. Sqdn., 474th Ftr. Grp., 9th Air Force. Right, marking on inside of both tail assemblies.

P-38J, 430th Ftr. Sqdn., 474th Ftr. Grp., 9th Air Force. Right, marking on inside of both tail assemblies.

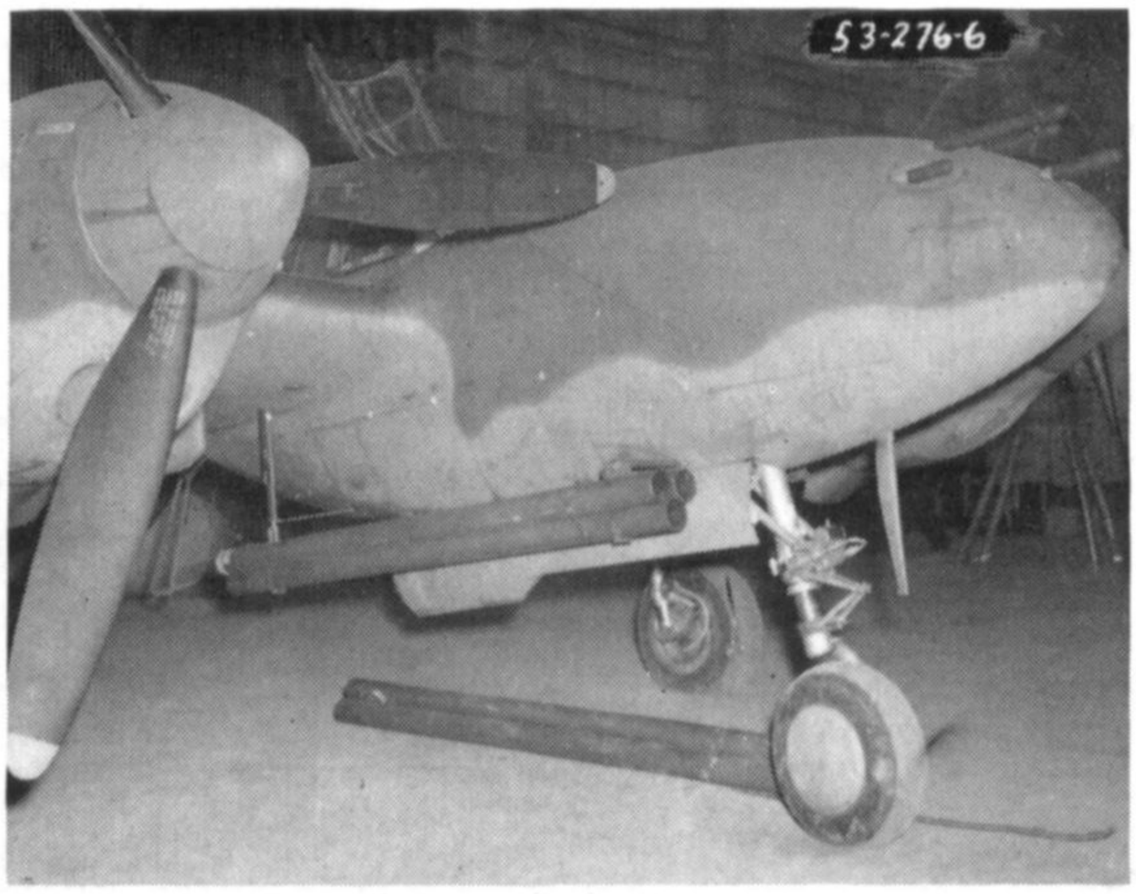
P-38J-15-LO, 43-28550, 55th Fighter Squadron, 20th Fighter Group, 8th Air Force, U.K. 1944. Right, marking on inside of both tail assemblies.



P-38M, 44-26865, "Night Lightning", first P-38M converted from P-38L-5-LO.



"Yippee"—the 5,000th P-38 built. The all-red machine, flown here by Milo Burcham, was a P-38J-20-LO, 44-23296.

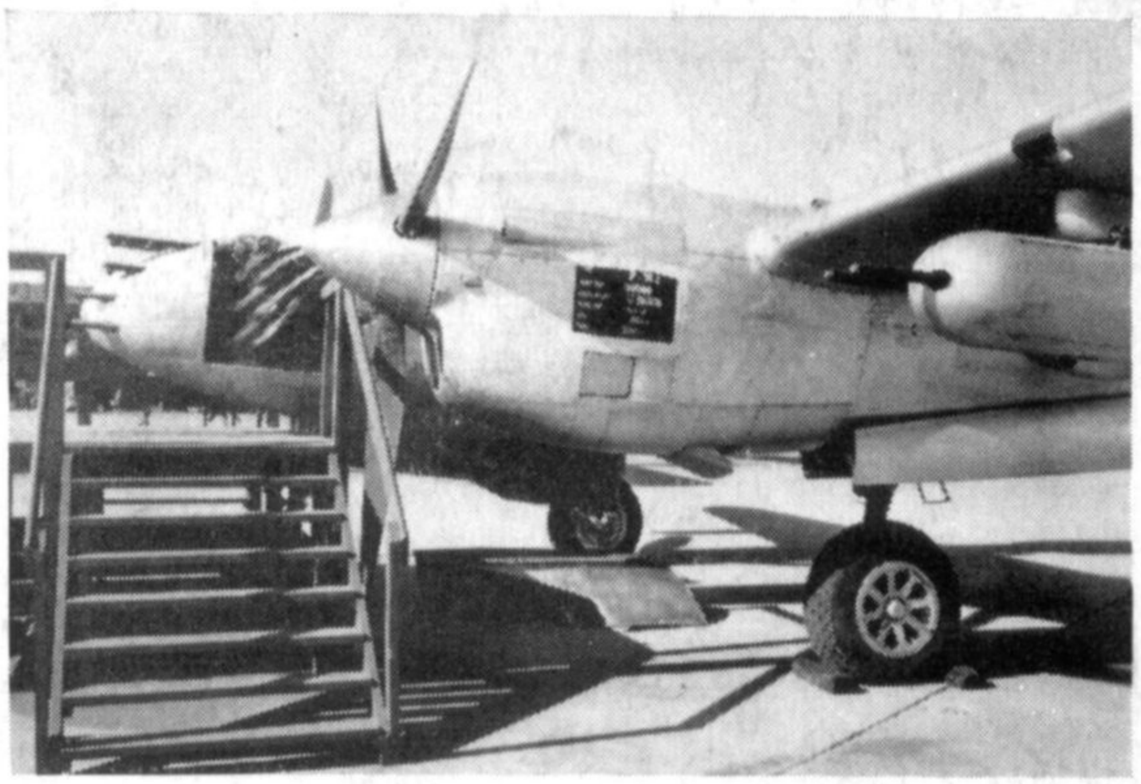


P-38G-15, 43-2295, displays the early type of rocket launcher installation. (Photo: Lockheed)

rear-hinged, jettisonable top panel, and optically-flat bullet-proof windscreen. Pilot armour included plates on forward bulkhead, bottom and rear of seat, and above and behind seat. Radio equipment was carried in housing behind the cockpit; for armament details see relevant paras. in text. Booms; these consisted of powerplant housing forward of main spar, forward section attached to wings, and aft section containing coolant radiators and intakes. Two oxygen bottles were housed in port boom, one in starboard. Tail assembly with twin vertical fins and rudders. Main undercarriage was housed under superchargers in forward boom sections and retracted rearward, nose wheel was attached to forward section of fuselage nacelle, immediately aft of gun bay, and retracted rearward into nacelle. All gear completely enclosed within airframe profile by flush doors.

STRUCTURAL FEATURES

An examination of the P-38 forcefully emphasizes its use of shear webs. The cockpit floor and sides, the wheel well sides in the booms and the fuselage are flat sheets of dural; none of the conventional bulkhead-stringer construction is apparent, and the structure is light, clean and strong. The armament compartment



The P-38L-1-LO fitted experimentally with eight ·50 cal. guns in the nose and four more in two underwing pods.
Phhoto: W. T. Larkins)

is readily accessible through two large doors. The machine-gun links and shells are ejected from the aircraft through four chutes, the outer ends of which are normally covered with "fish paper" to present a cleaner surface for non-combat flying, the paper being ruptured by the first ejected shell when firing commences. The cannon shell cases are retained in a rubber-lined compartment in the right hand side of the fuselage, accessible through a hatch secured by Dzus fasteners. The hinging of armament compartment and landing-gear doors is by unusual Studebaker-type hinges; ailerons are attached by "piano" hinges flush with the wing upper surface. All trim-tabs are secured on "piano" hinges, while rudders and elevators employ ball-bearing hinges. The Lockheed-Fowler flaps are operated by a Vickers hydraulic motor driving an irreversible screw; this transmits motion to the flap carriages by means of flexible cables. The four flap sections are mounted on carriages which travel in tracks, the geometry of which lowers the trailing edge of the flaps as the carriages extend the flaps rearward.

The publishers wish to express their gratitude to Mr. Jay Frank Dial for his assistance in the preparation of some of the illustrations appearing in this Profile.

SPECIFICATION

P-38L-1/5-L0

Dimensions: Span, 52 ft.; length 37 ft. 9$\frac{15}{16}$ in.; height (on ground) 9 ft. 10$\frac{3}{8}$ in. Weights: empty, 12,800 lb.; basic 14,100 lb.; max. 22,000 lb.

Armament: One AN-M2 20 mm. cannon with 150 r.p.g.; four ·50 calibre M-2 Browning machine guns with between 300 and 500 r.p.g.; all mounted in nose of fuselage nacelle: for further armament details see relevant paragraphs in text).

Powerplant: Two 12-cylinder liquid-cooled Allison V-1710-111 (stbd.) and V-1710-113 (port) engines with clockwise and anti-clockwise drive respectively. Each engine installed with single-stage blower of 8·10:1 gear ratio driving an impeller of diameter 9$\frac{1}{2}$ in. located in accessory housing, fed by exhaust-driven turbo-supercharger (G.E. Model B33).

Performance: Maximum speed: 414 m.p.h. at combat emergency power at 25,000 ft. at 17,500 lb. Climb to 20,000 ft. at 17,500 lb., 7 minutes. Service ceiling, 44,000 ft. Representative combat range at 290 m.p.h. at 10,000 ft. at 20,700 lb., 450 miles. Ferry range at 198 m.p.h. at 10,000 ft. at 21,500 lb., 2,600 miles.

Engine performance: Take-off rating 1,475 h.p. at 3,000 r.p.m.; 1,100 h.p. at 2,600 r.p.m. at 30,000 ft. (with turbo); combat emergency rating, 1,600 h.p. at 28,700 ft.

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