

A Study In Longevity

The Curtiss P-40 in W.W. II

PART I

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P-40C's of the 33rd Pursuit Squadron, 8th Pursuit Group being loaded aboard the WASP for transfer to Iceland; Norfolk, Virginia, 23 July 1941. (PHOTO-Nat. Arch. No. 80-G-466010).

When a discussion of fighter aircraft eventually turns to the Curtiss P-40), there is the feeling that many persons cannot understand the continued production of this "mediocre" design, after the introduction of superior types to the combat zones. Their reasoning appears to be that, after the republic P-47B and North American P-51B entered service, the P-40 should have been dropped at once. In their opinion, even the Lockheed P-38 should have had some affect on orders for the Curtiss fighter. This type of thinking, however, does not seem to take into account the chronological sequence of orders and deliveries concerning the major U.S.A.A.F. fighter types, or the many events and circumstances that affected this sequence. In the case of the P-40, many factors combined to keep it on order. However, when the P-47 and P-51 had reached sufficient numbers, and had proven themselves in combat, the production of the Curtiss did, in fact, end. That it was still in front-line service at the time of the Japanese surrender also has a logical explanation.

To understand the continued manufacture of the Warhawk, its development through many designations must be closely scrutinized. This study, then, begins with the immediate sire of the P-40, the Curtiss Y1P-36.

After the Army Materiel Division's pursuit competition of April 1936 resulted in an order for seventy-seven Seversky P-35's, the Curtiss Airplane Division of the Curtiss-Wright Corporation received a contract for three service-test models of their losing Design 75-B, designated Y1P-36. The principal change between the two was the engine, that requested by the Air Corps being the Pratt and Whitney R-1830 Twin Wasp. Ordered in July 1936, the first of these was completed the following March and sent to Wright Field for evaluation. The Y1P-36, not plagued by the engine trouble which had caused the 75-B to lose the competition, achieved excellent results during test flights. These so impressed officials that an order for 210 production P-36A pursuits was given Curtiss on 7 July 1937.

At this point, the mission of fighter aircraft in the U.S. Army Air Corps entailed only duties conducted at low and medium altitudes. Turbo-superchargers for high-altitude performance were considered too heavy and not really vital. Their expense was also not in their favor in an economy-minded military. But a slight change in this line of thinking resulted from the first reports of developments in Europe. The years 1935 and 1936 had seen the first flights of three fighter types that would earn accolades in the coming decade: the Messerschmitt Bf 109, the Hawker Hurricane, and the Supermarine Spitfire. Accounts of their performance at altitude caused the Air Corps to write a specification for a high-altitude high-speed interceptor. Three manufacturers submitted designs for consideration employing turbo-supercharged Allison engines. The Allison, it should be remembered, was the only liquid-cooled engine available at the time capable of handling large orders from the Army.

Curtiss, overlooking nothing in its attempt for a substantial contract, had been working on an Allison-powered version of its Design 75-B, even as the Y1P-36's were under construction. Utilizing the basic design with a modified fuselage, the Model 75-1 was

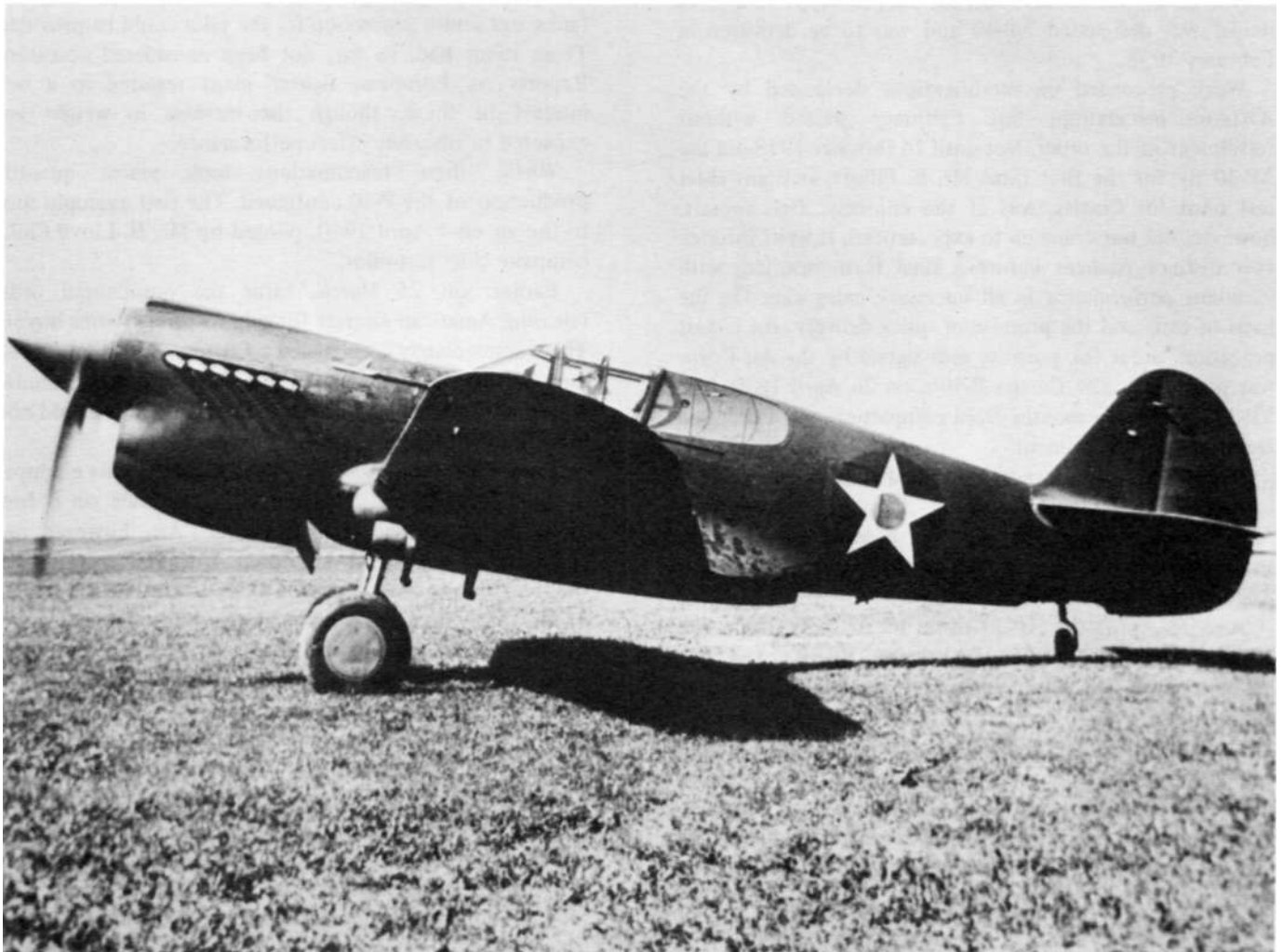
completed and offered to the Air Corps on 1 April 1937. Designated XP-37, this aircraft performed well enough to bring an order for thirteen service-test YP-37's.

On 18 May 1937, the Bell Aircraft Corporation submitted a proposal for a cannon-armed interceptor with the engine in the fuselage behind the pilot. This plan resulted in an order for a prototype labelled XP-39 five months later, on 7 October 1937.

Also that spring, Lockheed offered detailed drawings on a radical twin-engined twin-boomed aircraft armed with four cannons and four machine guns. An order quickly came in June for a prototype, designated XP-38.

Curtiss had been first with a completed aircraft. The Air Corps was still not convinced of the need for these high-altitude fighters, although anxious to obtain a pursuit using the Allison engine. They were bolstered in this resolve by the high speeds attained by European models sporting liquid-cooled engines in pointed, streamlined noses.

Ever mindful that the Army was on the verge of expansion due to political movements the world over, Curtiss submitted a proposal designated 75-P. The plans would entail only a relatively simple engine change to the Y1P-36 design. This proposal promised the least expense,



A P-40D warming-up (Photo—Unknown).



A line-up of P-40E's of the American Volunteer Group, sometime before July 1942 in China (Photo-R. Hill).

due to the airframe already beginning production and the elimination of the turbo-supercharger. This fact would give the 75-P its best performance at 12,000 to 15,000 feet. This, coupled with the maneuverability of the Y1P-36, completely suited prevalent Air Corps pursuit tactics. A contract resulted, dated 30 July 1937, which allowed Curtiss to use the tenth P-36A for the prototype 75-P. This model was designated XP-40 and was to be delivered in February 1938.

Work proceeded on modifications demanded by the Allison installation, but February passed without fulfillment of the order. Not until 14 October 1938 did the XP-40 fly for the first time. Mr. E. Elliott, assistant chief test pilot for Curtiss, was at the controls. This aircraft, however, did not come up to expectations. It went through two distinct changes before a final form resulted, with excellent performance in all necessary categories. On the basis of tests and the promise of quick delivery, the largest peacetime order for pursuits ever signed by the Air Corps was placed for 524 Curtiss P-40's, on 26 April 1939. The YP-37's, still two months from completion, were dropped from further development.

Before Curtiss received this valued contract, the XP-38 had flown (27 January 1939). On the basis of its performance, thirteen YP-38's were ordered, on 27 April, and sixty-six production models were contracted for on 10 August.

Also in April, the XP-39 made its first flight. On the 27th, orders were placed for twelve YP-39's and one YP-39A. This Bell product showed phenomenal speed at high altitude.

One month earlier, another contender appeared for the high-altitude interceptor contract. As a private venture, Seversky developed the AP-4, a radial-engined turbo-supercharged refinement of earlier designs. After testing, thirteen YP-43's were put on order for the Air Corps.

Curtiss-Wright, however, won the race for the immediate fighter contract, but could not afford to rest on its laurels.

Advance planning had given them the opportunity to provide the replacement for their P-36. Now began the fight to keep ahead of the competition by designing the successor to the P-40. The performances of the rival XP-38 and XP-39 were far above the P-40's at altitude, and their armament proposals showed the trend toward more and heavier firepower as exemplified by the British fighter types.

Keeping abreast of developments overseas, Curtiss took what they thought were the best ideas and drew up plans for a small fighter utilizing the newly-proven Allison F3R engine. Its speed was estimated as 410 mph at 15,000 feet. This design disdained a turbo-supercharger, but the armament was to be ten machine guns. The Air Corps drew up a specification around this proposal and ordered two prototypes as the XP-46, on 29 September 1939.

Meanwhile, the N.A.C.A. had been studying the XP-39 and recommended certain changes to the design. These changes were made to the prototype, which flew again as the XP-39B on 25 November 1939. The turbo-supercharger had been removed, thereby bringing the Bell fighter into the same category as the P-40 already in production. Other changes lowered the speed but improved maneuverability. These alterations were then applied to the YP-39's previously contracted for.

One month after Curtiss received the XP-46 order, the Air Corps changed specifications so that self-sealing fuel tanks and armor protection for the pilot could be provided. These items had, so far, not been considered necessary. Reports on European fighter plans resulted in a new interest in them, though the increase in weight was expected to adversely affect performance.

While these machinations took place, quantity production of the P-40 continued. The first example took to the air on 4 April 1940, piloted by Mr. H. Lloyd Child, company chief test pilot.

Earlier, on 25 March, came the presidential order releasing American aircraft for sale to foreign arms buyers. This immediately enhanced Curtiss' position as a manufacturer of fighters. Already enjoying profits from the sale of various versions of the P-36/H75A, they could now offer the P-40/H81A to prospective purchasers.

France was first, ordering 200 of these pursuits equipped to French standards. This model, first flown on 6 June 1940, never reached the Armee de l'Air, however, and ended up in the Royal Air Force. With follow-up orders, the R.A.F. purchased over 1,000 of the H81A models under their three basic designations. Although not up to Continental standards appertaining by this time, they did serve well in the North African desert where their low-level capabilities could be utilized.

British representatives on scene at the Curtiss plant evinced an interest in the Allison F3R engine. They, however, decided that the R.A.F. would rather have this power plant used in a modified P-40 than in an entirely new design. This would greatly facilitate production without appreciably interrupting the factory's delivery rate. Modifications to the fuselage were few. The Model 87A was ordered in May 1940.

End of part I
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P-40E's of the 28th Bomb. Group at Fort Glenn, Umnak Is., Aleutian Islands, in 1942. (Photo—SC 140066)



A Kittyhawk IA (P-40E-1) of No. 15 Fighter Squadron, R.N.Z.A.F., in 1942. (Photo-R. Hill) (to be continued in next issue)