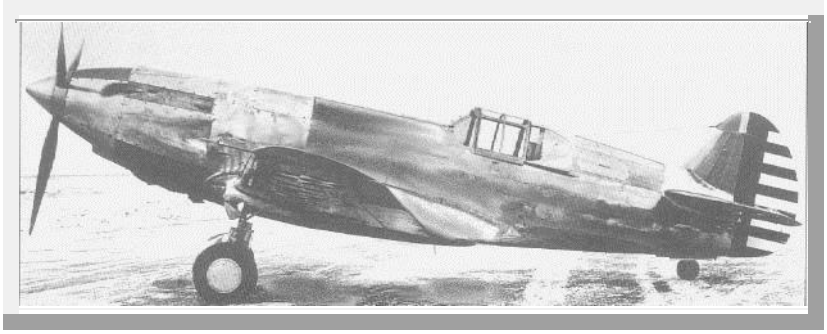
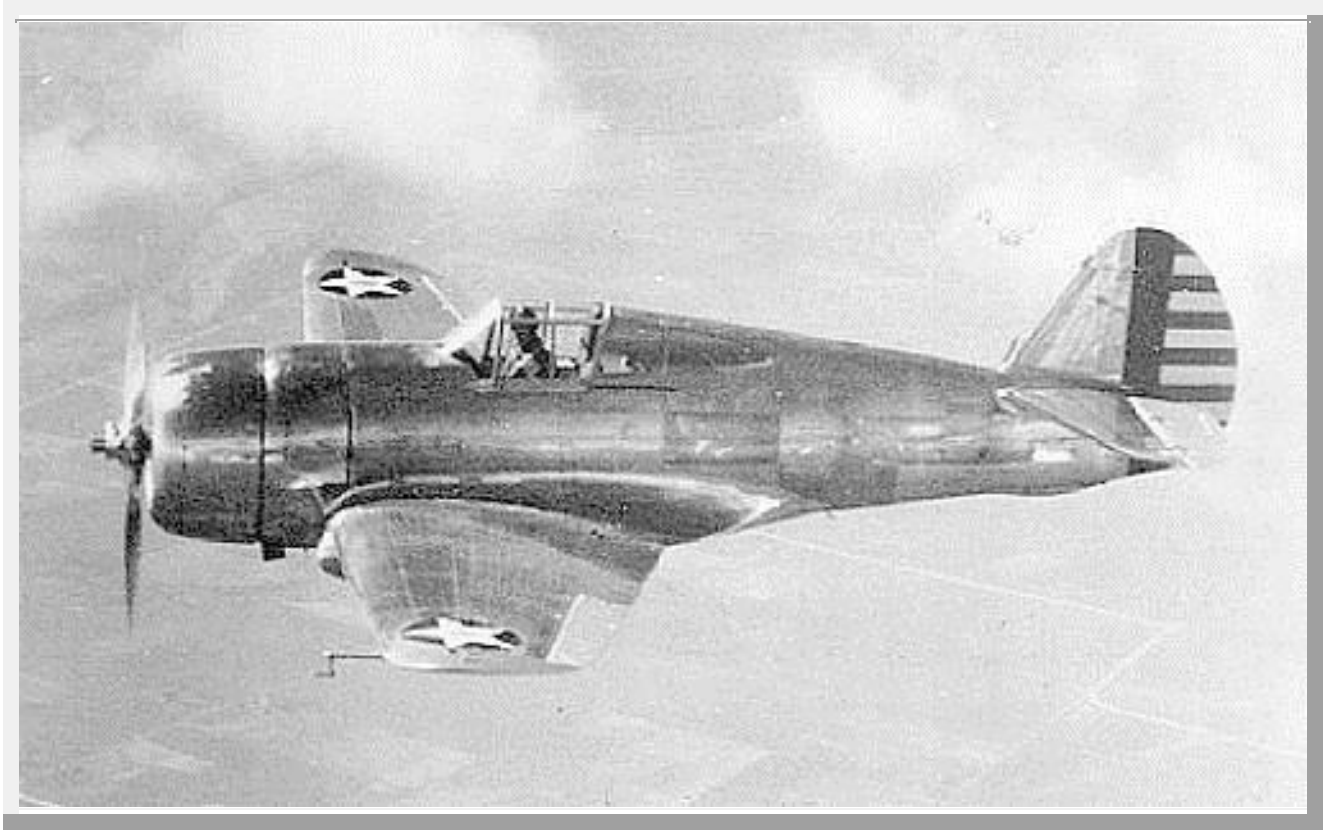
FLYING THE PROTOTYPES
Excerpted from Destiny: A Flying Tiger's Rendezvous With Fate by Erik Shilling
Part One:
The Curtiss YP-37



The Curtiss YP-37

In November 1940, I received orders to report to Headquarters Squadron. Base Engineering at Langley Field, Virginia. While in this squadron, I had the opportunity to fly many different types of airplanes, and I was quite happy with the assignment. All incoming or outgoing aircraft first went through this squadron. They were inspected, test flown, and then turned over to their assigned squadron. Two of the most interesting aircraft that came through engineering were the Curtiss YP-37 and Bell YFM-1.

The YP-37 built by Curtiss was the first Army Air Corps fighter plane to use the Allison V-l710-11 engine. The airframe from the Curtiss P-36, an airplane already in production, was used to build the XP-37.



The Curtiss P-36 Hawk

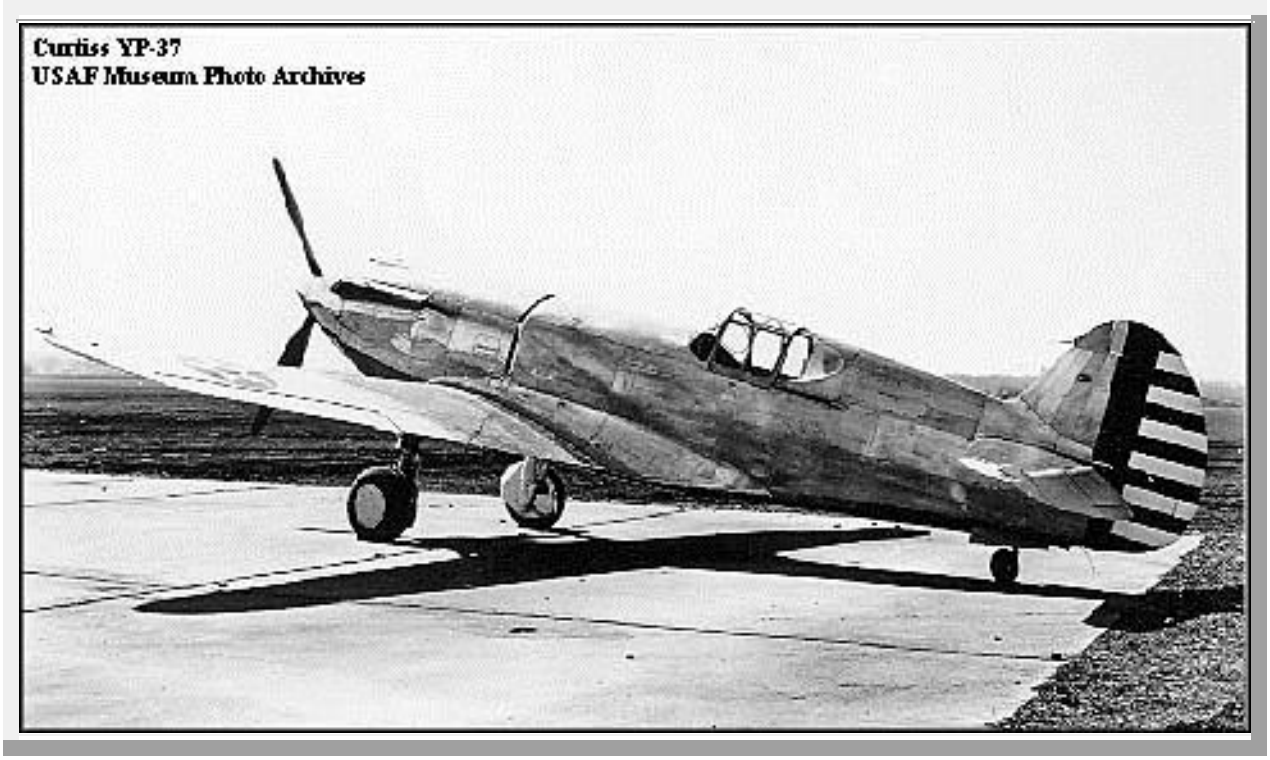
The fuselage was lengthened to reduce drag and the cockpit was moved aft to make room for the turbo supercharger and inter-cooler. On the YP-37A's, the next model to be built, the fuselage was lengthened even more. After the first XP-37 was built and tested, a service group of thirteen was ordered.

My first flight in the YP-37A was damn exciting. Since there were no pilots at Langley who had flown the YP-37A, I had to rely on the aircraft's operating flight manual. I studied it for several hours, then sat in the cockpit for more than an hour to familiarize 'myself with the controls and instruments. I felt as ready to go as I would ever be, I started the engine and taxied out to the northwest runway, Langley's longest, for my first flight.

The Curtiss XP-37

The Allison engine checked out okay during run-up. Although the Prestone temperature was on the high side of normal, it was still within limits. I poured the coal on and took off. Just as I became air-borne, the Prestone temperature's warning light flickered, then stayed on.

It was too late to land, since there was no runway left. There was little I could do except throttle back and try to cool the engine. Normally, reducing power would help. I had hoped I could circle the field and land back on the runway, with the reduced power.



The YP-37

Much to my distress, things got worse. The Prestone boiled over as I turned downwind. The windshield was covered with gobs of gooey glycol from the radiator, making it impossible to see through the windshield. I rolled the canopy back, and stuck my head out the side, The hot glycol hit me in the face. Luckily, the goggles protected my eyes, but they too were soon covered with the smeary stuff, however, I was able to keep them clean enough by constantly wiping them with my scarf.

A quick glance at the speed indicator just at lift-off showed sixty mph. I knew It was in error, but my attention had been distracted by a more pressing problem. Normally, an inoperative airspeed indicator didn't present any difficulty, if I could have climbed upstairs and got to know the airplane before making a landing. At that moment, I had a grand total of two minutes in the YP-37A, hardly time enough to become comfortable with the airplane. On the downwind leg, the speed showed only eighty, though I knew it had to be closer to one hundred fifty, since this airplane stalled at eighty five miles per hour.

With my head stuck out the side of the cockpit, I still couldn’t see very well and didn’t know how fast I was going. The landing was going to he a tough one. I had to call on my overworked Guardian Angel once again.

I contacted the control tower, "May Day, I have an emergency and must land immediately." "Cleared to land. The crash crew is on the way."

I was able to get out a brief, "thanks," and then concentrated my attention on flying the airplane. I circled back for landing and stayed within gliding distance of the field in case the engine quit. I could at least turn toward the field and belly land on the grass. Without the benefit of knowing the speed, I played it safe and came in a little hot. Fortunately, I had plenty of runway, and my landing was okay, but having my head stuck out of the cockpit made it very difficult. I slowed down and turned off the

runway. When clear, I stopped in the grass and cut the engine. I could hear it crackling from the heat, so I jumped out in case it caught fire. If it did, I would have a head start and be long gone when it happened. While I waited nearby for the crash vehicles to arrive, I had time to thank my special Angel. I knew I would be lost without him. When the ambulance pulled up, I jumped in and was taken to base operations.

I found out later the airplane had been undergoing flight tests at NACA (National Advisory Committee on Aeronautics), and at the completion of the tests it was turned over to Base Engineering. The tests they were conducting were a series of flights that required the installation of specially calibrated test instruments. The airspeed indicator, of course, was among them. When they removed their instrumentation, NACA forgot to cap off the "T" they used that was part of the airplane's original pitot system which showed the plane's airspeed. This was the reason for the very low airspeed indication.

Part Two:
The Bell YFM-1 Airacuda

The Bell YFM-1 Airacuda

Another airplane I flew was the YFM-1 Airacuda, made by Bell Aircraft Corporation in Buffalo, New York. It was a pusher built around two exhaust-driven turbo-charged Allison engines of 1040 horsepower each. It was new in type and concept. The design's hypothesis was that it would he used as a bomber-destroyer. It had thirty-seven millimeter cannons, one in the nose of each nacelle, but little in the way of defensive weapons. Several other innovations were being explored on the Airacuda that were not used on any previous military airplanes. Because some of the innovations were impractical, they haven’t been used since.

The Bell XFM-1 Airacuda

Flying the Bell Airacuda was a new experience for me, since it was the first pusher aircraft I'd ever flown. Its handling characteristics were foreign to anything I had ever had my hands on. Under power it was unstable in pitch, but stable with power off. While flying straight and level, if a correction in pitch was required, a forward push on the control resulted in the airplane wanting to pitch over even more. Pitch control became a matter of continually jockeying the controls, however slightly, even when the aircraft was in proper trim. The same applied if pulling back on the control. It would tend to continue pitching up, requiring an immediate corrective response. The same happened in a turn with power off, the Bell became stable in pitch. This was fortunate because during approach and landing, it was very stable, and a nice flying airplane.

The Bell XFM-1 Airacuda

It was built around several new ideas never tried before, and was unlike any other fighters up to that time. First, it wasn't designed to be a fighter plane, although many had the mistaken idea that it was. It could be better described as a bomber destroyer. The tactics suggested by its designer were based upon the machine being used as a flying anti-aircraft platform. It was a defensive weapon to be used only against incoming bombers that were beyond The range of escorting fighters. Although it had some defensive weapons, I think they were more psychological in nature, for the benefit of the YFM-1 crew, than practical.

The tactics envisioned were that the Airacuda would fly in trail, just out of range of the enemy bomber formation's guns. Up to that time bombers had .30 and .50 caliber weapons. It is important for the reader to keep in mind that the Bell would be used only against enemy bomber formations that were out of range of protective fighter escort. The YFM-1 had little or no effective firepower for its defense, and as a consequence, would be a sitting duck against agile fighters. The front of each engine nacelle housed a 37 mm, gyro-stabilized cannon. With the longer range of the 37 mm guns, they could pluck the enemy bombers off one by one, In other words, it was a mobile anti-aircraft gun platform.

The Bell YFM-1 Airacuda

The primary function of the men in the nacelles was loading the guns, although they could be fired by the gun crew in an emergency. Initially, the pilot of the plane aimed the airplane in the general direction of the formation. Further correction in aim would then be made by the gun control officer, and fired by him. His station was directly behind the pilot, using an inverted periscope that came out through the belly of the ship to aim the guns. The fire control officer would clutch the guns into the gyros, which stabilized them. From that moment on they would stay on target. The person operating

the guns could then make any further correction and fire away until the bomber was brought down. His position had swing-out flight controls and in an emergency he could fly the airplane. If it was necessary to abandon the aircraft, the pilot would have to feather both engines to prevent the propellers from chewing the men to pieces, especially those in the nacelles The flight manual said they would feather in six seconds; that's a long time in my book. In addition to being a pusher airplane, the YFM-1 also had other unusual features. It had only one engine-driven accessory, an emergency fifty-ampere generator on the left engine. The Bell Airacuda was an electrical nightmare. All normally driven engine accessories such as fuel pumps, hydraulic pumps, vacuum pump, and the gyros stabilizing the guns were electrically driven. Because of all the electrical energy required, the ship had to have a full-time auxiliary power unit. The auxiliary power unit was driven by a powerful four cylinder gasoline engine which ran all the equipment. Since the aircraft was required to operate at high altitudes, the APU also had to be turbo-supercharged. To do this, a dual bleed came from the same exhaust turbochargers that super-charged the Allison engines. The power unit was the weak link in the system.

The Bell YFM-1 Airacuda

Changing fuel tanks was simple. There was no fuel selector as we normally think of one. Each fuel tank had its own fuel pump. Tanks were changed by flipping the switch on for the electric fuel pump of the desired tank. The gear and flap selector was similar in appearance to the C-47's fuel selector. Gear and flaps were activated by rotating this control to the appropriate position. It only had three positions, takeoff, fly and land, and could be turned only in a clockwise direction. In the takeoff position, the flaps were retracted. In the fly position, the gear was retracted, and in the land position, both gear and flaps came down. The flaps immediately followed the gear. Unfortunately the two were not isolated from each other, and that posed a minor problem.

To get gear only, such as on downwind, the pilot would watch the gear as it extended. When almost all the way down, he tripped the circuit breaker. Then on final, when the flaps were required, the breaker was turned back on. At the completion of the landing roll, the pilot would select fly position, retracting the flaps. The engines had no cooling fans, so in summer the airplanes had to be towed to the takeoff position before starting. As soon as there was an indication of an oil temperature rise, the pilot immediately started the takeoff run. When landing, if the oil temperature was on the high side, the pilot would have to shut the engines down and have the ship towed to the parking area. If the airplane had only a short distance to taxi, it could continue to its parking place under its own power.

One recurring problem experienced by pilots flying the Airacudas was that the auxiliary power unit would all too frequently stall or quit. The reverse current relay would stick and motorized the generator. Since this would drain most of the current from the battery, all electrical systems became inoperative: NO fuel pressure, NO vacuum, NO hydraulic pressure, NO gear, NO flaps and NO ENGINES. The first time I lost both engines, I was in the landing pattern on base leg just about to turn final when the APU quit, then a second later so did both Allison engines.

Fortunately, it occurred right after the gear locked down, and I was able to make the runway without power. Although the airplane had a wobble pump, the handle was only four inches long. It was impossible to supply two Allison engines with the wobble pump, since they consumed over three hundred gallons of fuel per hour at full power. Its only purpose was to start the engines.

The second time the problem occurred, I was flying on instruments, but again I was fortunate. They both quit not too long after I had started into the overcast. I knew there was a couple thousand foot ceiling under the cloud base, so I dove out of the cloud before the gyros tumbled. All the while, the crew chief was trying to restart the APU, which started with room to spare. With the APU going, the fuel pumps came on and both Allison engines began producing power. The remainder of the trip to Langley was uneventful and I made a safe landing there.

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