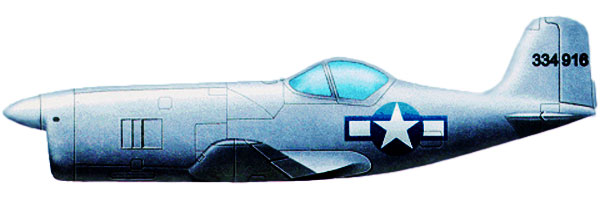
**Bell XP-77 WWII Wooden Fighter**



Bell was the only US manufacturer to produce propeller-driven single-engined fighters with a tricycle landing gear during the war, notably the [**P-39 Airacobra**](http://www.fiddlersgreen.net/models/aircraft/Bell-P39-Airacobra.html) and P-63 Kingcobra. In between these designs was the diminutive **XP-77,** which was an early configuration for the P-39 dusted off and redesigned to use non-strategic materials, mainly wood. The **XP-77** was covered with stressed plywood that had been impregnated with plastic/resin bonding. The skin was then attached to the framework with nails and glue. The fuselage and wing were integral units and the cockpit was sealed off by fume-proof bulkheads that separated the pilot from the engine and fuel tank. As work progressed, it became clear that the weight of the aircraft was going to rise sharply, and Bell realized that there were troubled times ahead.

Six prototypes were ordered and the first was delivered only six months after the contract was signed. Despite its simple construction, project costs rose and delays increased, so orders were reduced to just two prototypes. The **XP-77** proved to have tricky handling characteristics and lower than expected performance. In October 1944 the second prototype went into an inverted spin from which the pilot could not recover, so he left it to its own devices. Two months later the project was cancelled.

**Bell XP-77**



The tiny Bell XP-77 was an attempt to solve two problems facing the American aircraft industry following the outbreak of World War II. The first was the possibility of shortages of light metal alloys used in airframe construction. The war had caused a rapid increase in the use of these metals, and it was feared that their production could not keep pace with the demands of the industry. The second problem was that presented by the appearance of the highly maneuverable Japanese Zero-Sen, a fighter far more agile than its American opponents. Therefore, the XP-77 was intended to outmaneuver the Zero-Sen and be constructed mainly of wood.

The lightweight fighter concept had intrigued designers for many years. In Europe, nimble wooden fighters had already been built and used with some degree of success. In contrast, American fighters had increased in weight and speed but maneuverability had suffered. Bell proposed building their Tri-4, a wooden fighter with an estimated top speed of 410 mph at 27,000 feet, carrying two 20 mm cannons and two .50 cal. machine guns, yet weighing only 3,700 pounds! Procurement of twenty-five of the little Tri-4 fighters as P-77's was authorized on May 16, 1942, but unavailability of a supercharger for the selected engine led to a reduction to six aircraft. The first of these was ready for flight testing on April 1, 1944, by which time the contract had already been cancelled because the need for such a fighter no longer existed. Nevertheless, Bell was requested to complete the second XP-77 for flight trials. The 520 hp unsupercharged Ranger XV-770-7 did not deliver the estimated performance, and the XP-77 had a top speed of only 330 mph at 4,000 feet. Further evaluation showed that the little wooden fighter did not offer any advancement over existing production fighters.

The engine, mounted rigidly to the airframe, caused excessive vibration at some speeds. On October 22, 1944, the second XP-77 was destroyed when the pilot attempted an Immelmann turn which resulted in an inverted spin.

Although the speed of the XP-77 was disappointing, the designers did manage to keep the actual weight within the estimated figure; empty weight was 2,760 pounds, gross was 3,583 pounds, and overload weight was 4,028 pounds. The XP-77's wing spanned 27 feet 6 inches, it was 22 feet 10.5 inches long and stood 10 feet 11 inches high. Wing area was 100 square feet. With a fuel capacity of 56 gallons, the XP-77 had a range of 550 miles at 270 mph. Service ceiling was 30,100 feet.



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| Bell XP-77 downloadable cardmodel from fiddlersgreen.net |

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| Bell XP-77 In Flight | Bell XP-77 Side View |

**Specifications for Bell XP-77**

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| 3 View of the Bell XP-77 | Length: 22 ft 10 in Wingspan: 27 ft 6 in Height: 8 ft 2 in Wing area: 100 sq ft Empty weight: 2,855 lb Max takeoff weight: 4,028 lb Powerplant: 1× Ranger V-770-7 inverted V12 engine, 520 hp  **Performance** Maximum speed: 330 mph  Range: 550 mi Service ceiling: 30,100 ft Rate of climb: 3,600 ft/min Wing loading: 40.28 lb/sq ft Power/mass: .13 hp/lb  **Armament Guns:** 1× 20 mm (0.787 in)  Hispano-Suiza HS.404 cannon,  firing through the spinner 2× .50 in (12.7 mm) M2 machine guns with 200 rounds each. **Bombs:** 1× 300 lb bomb or 1× 325 lb depth charge |

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| Bell XP-77 Callout | | | | | |
| A: Although the structure was very light, the XP-77 only had a 520 hp engine, which gave only half the power of even the fighters of 1940. | | B: The XP-77 pilot had good visibility in all directions except forward, where it was largely blocked by the long nose. | C: Test pilots did not give the XP-77 a favorable report because of its poor handling qualities, excessive vibration and the small and extremely noisy cockpit. | | D: The tricycle undercarriage gave good ground handling but in the air the stability proved inadequate. |
| Bell XP-77 | | |