

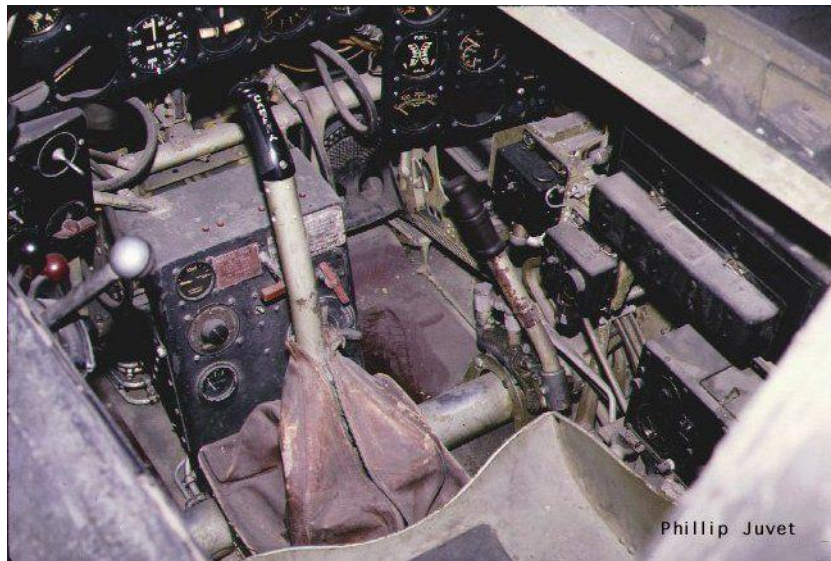
## Northrop XP-56 Black Bullet



[Northrop XP-56 Black Bullet au sol vu de profil](#)

Le 27 novembre 1939, l'USAAF lança le programme R40C pour un chasseur moderne, dont les performances, l'armement et la visibilité devaient être nettement supérieures à celles des chasseurs contemporains. C'était surtout un programme expérimental destiné à encourager les constructeurs à tester des configurations inhabituelles. Il eut pour concurrents le Vultee XP-54, le Curtiss XP-55 et le Northrop XP-56. Northrop proposa le projet N-2B, conçu à partir de ses projets d'aile volante. Il utilisait le moteur X-1800-A3G de 1800 hp, avec deux hélices tripales propulsives et contrarotatives. L'appareil devait également être armé de 2 canons HS 404 de 20 mm (100 obus chacun) et de 4 mitrailleuses M2 de 12,7 mm (400 cartouches chacune). Cet armement ne fut jamais monté. L'étude fut commandée officiellement par l'USAAC le 22 juin 1940, et un prototype fut commandé le 26 septembre 1940. Tout travail sur le X-1800 étant abandonné, Northrop se rabattit sur le R-2800-29 plus puissant (2000 hp). Seulement, il fallut revoir le fuselage en conséquence (le moteur étant plus large), ce qui prit 5 mois de plus. La configuration aile volante étant considérée comme risquée, décision fut prise de construire une maquette, le N-1M. Les essais de cette maquette s'avérèrent concluants, ce qui mena à la signature d'un nouveau contrat pour un second prototype le 13 février 1942. L'aluminium étant fortement utilisé pour la construction des chasseurs de l'époque, Northrop se rabattit sur des alliages de magnésium pour construire ses prototypes. Or, les propriétés de ce matériau étaient encore mal connues. Il fallait entre autre développer la technique du soudage TIG (gaz inerte et tungstène), ou procédé Héliarc, connue de Vladimir Pavleck qui fut débauché pour l'occasion. On devait découvrir plus tard que General Electric connaissait une telle technique. Le XP-56 fut donc le premier avion à être construit en magnésium. Les premiers essais remontent à fin mars 1943, mais le moteur et l'hélice causèrent des ennuis, et il fallut attendre août pour que Pratt & Whitney envoie un nouveau moteur. Les essais de point fixe, menés depuis le 6 avril 1943, ne se firent pas sans difficultés. Il fallut attendre le 30 septembre 1943 pour voir décoller le XP-56, entre les mains de John Myers. L'appareil ne dépassa pas une altitude de 5 pieds et ne vola que 30 secondes. Les problèmes de stabilité n'étaient pas encore entièrement résolus et il fallut agrandir la dérive pour les résoudre. Le XP-56 fut détruit le 8 octobre 1943, après l'explosion d'un pneu. Le second prototype incluait certaines modifications, notamment au niveau du rééquilibrage du centre de gravité. Il vola pour la première fois le 23 mars 1944 entre les mains de Harry Crosby, pendant moins de 8 minutes. La vitesse de décollage atteignait 160 mph, et le nez semblait extrêmement lourd, ce défaut ne disparaissant qu'une fois le train rétracté. Les hautes vitesses ne furent jamais atteintes. Le 30 mai 1944, il fut décidé de le tester en soufflerie à Moffett Field, CA, mais d'autres priorités firent que ça ne serait pas possible avant octobre. Au 10e vol, le pilote d'essai notait un manque de puissance, une consommation excessive de carburant, une lourdeur dans la queue.

Les vols cessèrent car trop dangereux, et l'avion fut cloué au sol pendant un an. En décembre 1945, l'apparition des avions à réaction rendit le XP-56 totalement obsolète et le programme fut abandonné. Le XP-56 n'avait volé que 5 heures 55 minutes. Il fut retourné à Northrop en 1946, puis confié au National Air and Space Museum en 1947. Le second prototype est actuellement stocké au Smithsonian Institution's National Air and Space Museum et en cours de restauration. Bien que l'appareil soit à peine capable de prendre l'air, il apporta tout de même à Northrop des enseignements sur l'aile volante, qui seraient affinés sur le XB-35, L'YB-49 et pour finir le B-2.



Source : <https://aviationsmilitaires.net/v3/kb/aircraft/show/563/northrop-xp-56-black-bullet>

The **Northrop XP-56 Black Bullet** was a unique prototype [fighter interceptor](#) built by the [Northrop Corporation](#). It was one of the most radical of the experimental [aircraft](#) built during [World War II](#). Ultimately, it was unsuccessful and did not enter production.

### Design and development

The initial idea for the XP-56 was quite radical for 1939. It was to have no horizontal tail, only a small vertical tail, used an experimental engine, and be produced using a novel metal, magnesium. The aircraft was to be a wing with a small central fuselage added to house the engine and pilot. It was hoped that this configuration would have less [aerodynamic drag](#) than a conventional airplane. The idea for this single-seat aircraft originated in 1939 as the Northrop N2B model. It was designed around the [Pratt & Whitney liquid-cooled X-1800 engine](#) in a [pusher configuration](#) driving [contra-rotating propellers](#). The U.S. Army ordered Northrop to begin design work on 22 June 1940, and after reviewing the design ordered a [prototype](#) aircraft on 26 September 1940. Shortly after design work had begun, Pratt & Whitney, however, stopped development of the X-1800. The [Pratt & Whitney R-2800](#) engine was substituted, although it was considered not entirely suitable. The new, 2,000-horsepower (1,500 kW) engine was 200 horsepower (150 kW) more powerful, but it had a larger diameter and required a larger fuselage to house it. This change delayed the program by five months. It was expected that the new engine would require a 2,000 lb (910 kg) weight increase and cost 14 mph (23 km/h) in top speed.<sup>[1]</sup> Since this tailless design was novel and considered high risk, it was decided to construct a small, lightweight plane of similar configuration for testing called the [Model N-1M](#). In parallel with the design of the XP-56, successful flight trials of the configuration were conducted utilizing this airframe, confirming the basic layout. Two small Lycoming engines powered this aircraft. These trials confirmed the stability of the radical design and, upon review, the Army decided to construct a second prototype, which was ordered on 13 February 1942.<sup>[1]</sup> Northrop constructed the XP-56 using magnesium alloy for the airframe and skin, because aluminium was forecast to be in short supply due to wartime demands. At the time there was little experience with magnesium aircraft construction. Because [magnesium](#) cannot be easily welded using conventional techniques, a team of [Vladimir Pavlecka](#), Tom Piper and Russell Meredith had to develop the [heliarc](#) welding technique for magnesium alloy. It resembled the [GMAW](#) predecessor processes developed in the 1920s by General Electric but, importantly, employed inert gas shielding.

### First prototype

First engine runs in the aircraft were conducted in late March 1943, but excessive propeller shaft flex caused the engine to fail. Pratt & Whitney did not send another engine until August, causing a five-month delay. Taxi tests of the XP-56 began on 6 April 1943 and showed a serious yaw problem. At first, it was thought to be caused by uneven wheel brakes, and considerable effort was placed into fixing this problem. Manual hydraulic brakes were installed and the aircraft flew on 30 September 1943 at [Muroc Air Base](#) in southern California. Eventually, the yaw problem was traced to a lack of aerodynamic stability, and to fix this the upper vertical stabilizer was enlarged from a mere stub, to one virtually matching the ventral unit in shape and area. After a number of flights, the first XP-56 was destroyed 8 October 1943 when the tire on the left gear blew out during a high-speed (~130 mph or 210 km/h) taxi across Muroc Dry Lake. The pilot, [John Myers](#), survived with minor injuries which he credited to his innovative wearing of a polo player's helmet.<sup>[2]</sup> Myers was the test pilot for several of Northrop's radical designs during the war.<sup>[3]</sup>

### Second prototype

A number of changes were made to the second prototype, including re-ballasting to move the center-of-gravity forward, increasing the size of the upper vertical tail, and reworking the rudder control linkages. This second prototype was not completed until January 1944.<sup>[1]</sup> The aircraft flew on 23 March 1944. The pilot had difficulty lifting the nose wheel below 160 miles per hour (260 km/h). He also reported extreme yaw sensitivity. This flight lasted less than eight minutes, but subsequent flights were longer, and the nose heaviness disappeared when the landing gear was retracted. Only relatively low speeds were attained, however. While urging NACA to investigate the inability to attain designed speeds, further flight tests were made. On the 10th flight, the pilot noted extreme tail heaviness, lack of power, and excessive fuel consumption. Flight testing was then ceased as too hazardous, and the project was abandoned after a year of inactivity. By 1946, the U.S. Army Air Forces was developing jet-powered fighters, and had no need for a new propeller-driven fighter aircraft.

## Specifications (XP-56 estimates)



Northrop XP-56 Black Bullet, S/N 42-38353; second aircraft.

### General characteristics

- **Crew:** one, pilot
- **Length:** 27 ft 6 in (8.38 m)
- **Wingspan:** 42 ft 6 in (12.96 m)
- **Height:** 11 ft 0 in (3.35 m)
- **Wing area:** 306 sq ft (28.44 m<sup>2</sup>)
- **Empty weight:** 8,700 lb (3,955 kg)
- **Gross weight:** 11,350 lb (5,159 kg)
- **Max takeoff weight:** 12,145 lb (5,520 kg)
- **Powerplant:** 1 × [Pratt & Whitney R-2800-29](#) radial, 2,000 hp (1,492 kW)

### Performance

- **Maximum speed:** 465 mph (749 km/h, 404 kn) at 25,000 ft (7600 m)
- **Range:** 660 mi (1,063 km, 570 nmi)
- **Service ceiling:** 33,000 ft (10,061 m)
- **Rate of climb:** 3,125 ft/min (15.88 m/s) at 15,000 ft (4600 m)
- **Wing loading:** 37 lb/sq ft (181 kg/m<sup>2</sup>)
- **[Power/mass:](#)** 0.18 hp/lb (0.96 kW/kg)

### Armament

- 2 × [20 mm](#) (.79 in) cannons
- 4 × .50 in (12.7 mm) machine guns

Source : [https://en.wikipedia.org/wiki/Northrop\\_XP-56\\_Black\\_Bullet](https://en.wikipedia.org/wiki/Northrop_XP-56_Black_Bullet)