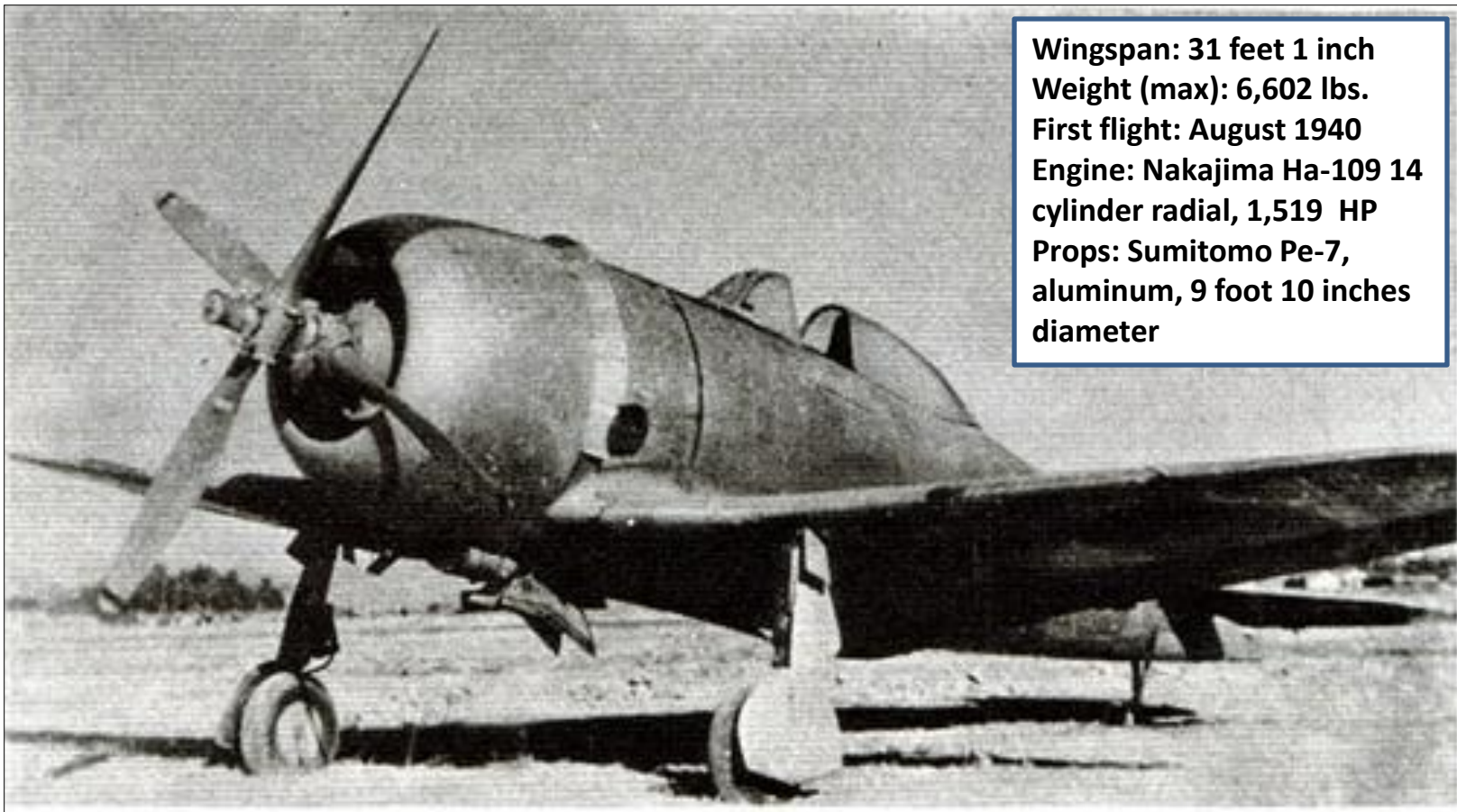


Nakajima Ki.44-I-Hei

1940

This Japanese Army interceptor had a powerful engine to enable high speed and a good rate of climb, but was heavier and more powerful than most fighters preceding it, so good piloting technique was required. Very little is known about the experimental contra-prop version of this aircraft, but the picture shows the fore propeller was likely controllable pitch by hydraulic means.



Wingspan: 31 feet 1 inch
Weight (max): 6,602 lbs.
First flight: August 1940
Engine: Nakajima Ha-109 14
cylinder radial, 1,519 HP
Props: Sumitomo Pe-7,
aluminum, 9 foot 10 inches
diameter

Kawanishi E15K Shiun “Norm”

1941

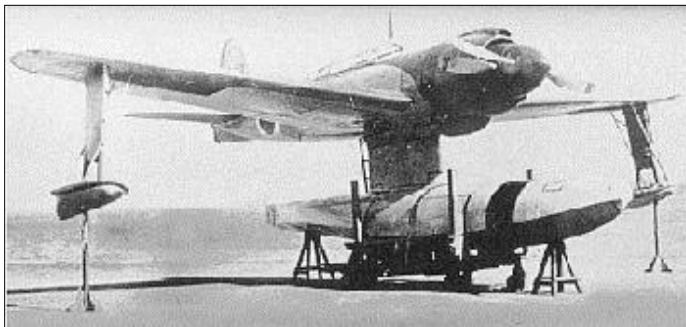
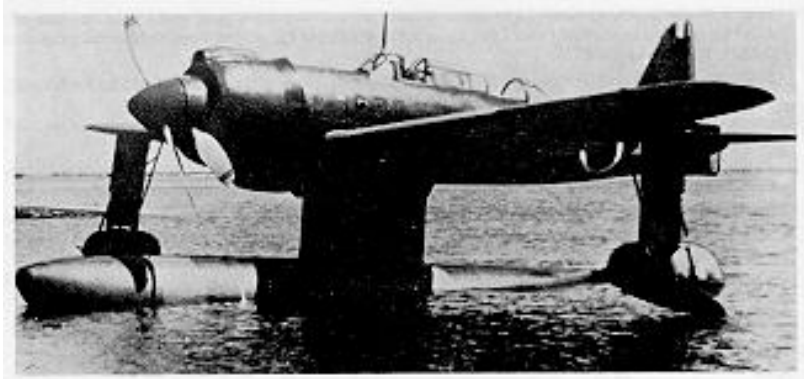
This Japanese reconnaissance float plane took advantage of contra-props which greatly improved directional control of this sleek aircraft on take-off. It had retractable, inflatable tip floats and a jettisonable main float to help out run attackers. Only 15 aircraft were made and it had short wartime life span in the Palau area of the South Pacific. It is likely the only production contra-prop aircraft to enter military service during WWII.

Wingspan: 38 feet Weight (max): 10,803 lbs.

First flight: December 5, 1941

Engine: Mitsubishi MK4D or MK4S Kasei 14 cylinder radial, 1,500 to 1,860 HP

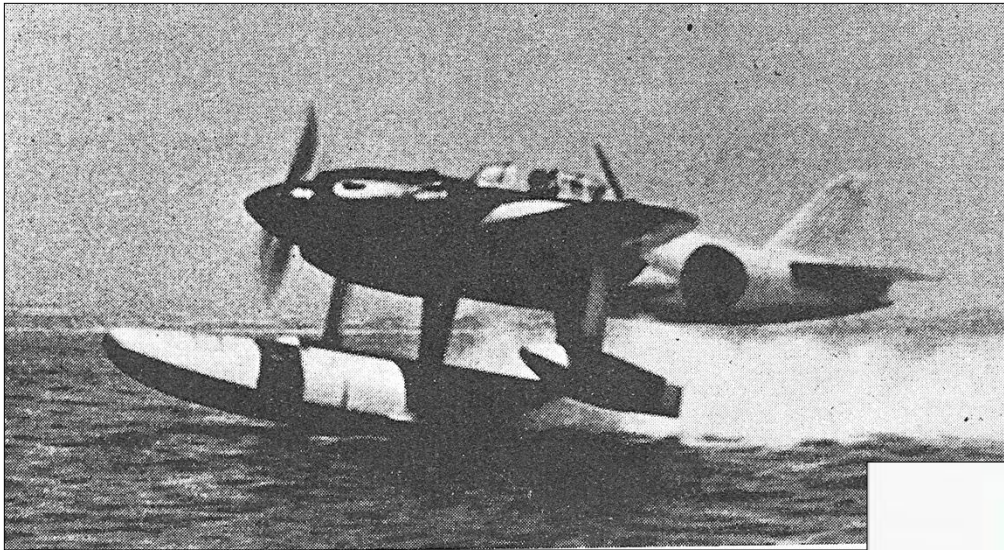
Props: Aluminum, 2 x 2 blade



Kawanishi N1K1 Kyofu

1942

From the same design team that produced the E15K, the prototype of this floatplane used a special engine and contra-rotating propellers, however the production version reverted to a single rotation unit due to the unreliability of the contra-rotation reduction gears. This floatplane aircraft, known as “Rex” to allies, was further developed into the N1K1-J Shiden land based fighter.



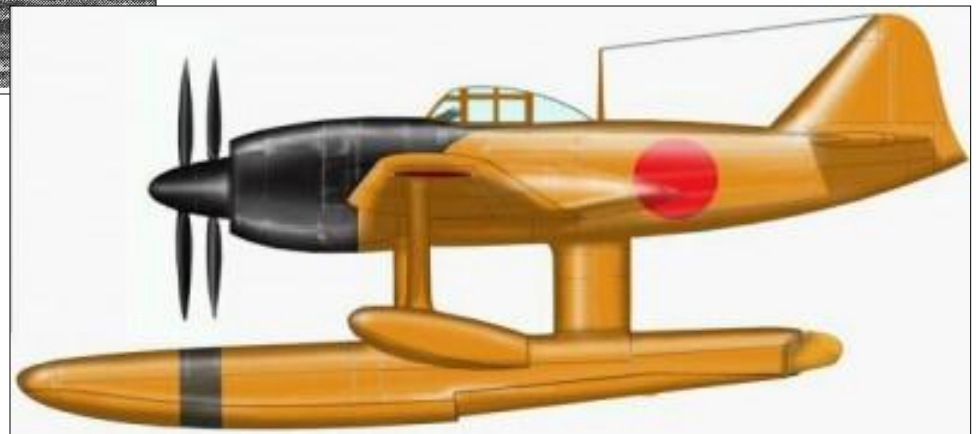
Wingspan: 34 feet 9.25 inches

Weight (max): 8,184 lbs.

First flight: August 1942

Engine: Mitsubishi MK4D Kasei 14, 14 cylinder radial, 1,460 HP

Props: Fixed pitch, 2 x 2 blade, approx. 10 feet 9 inches diameter



Curtiss XP-60C

1943

Prototype Army fighter was intended to use the Chrysler XIV-2220, but the length and the immaturity of the engine prevented its use. Instead, a P&W R-2800 and Curtiss Electric contra-props were installed for testing. Delays and modest performance prevented its advancement.

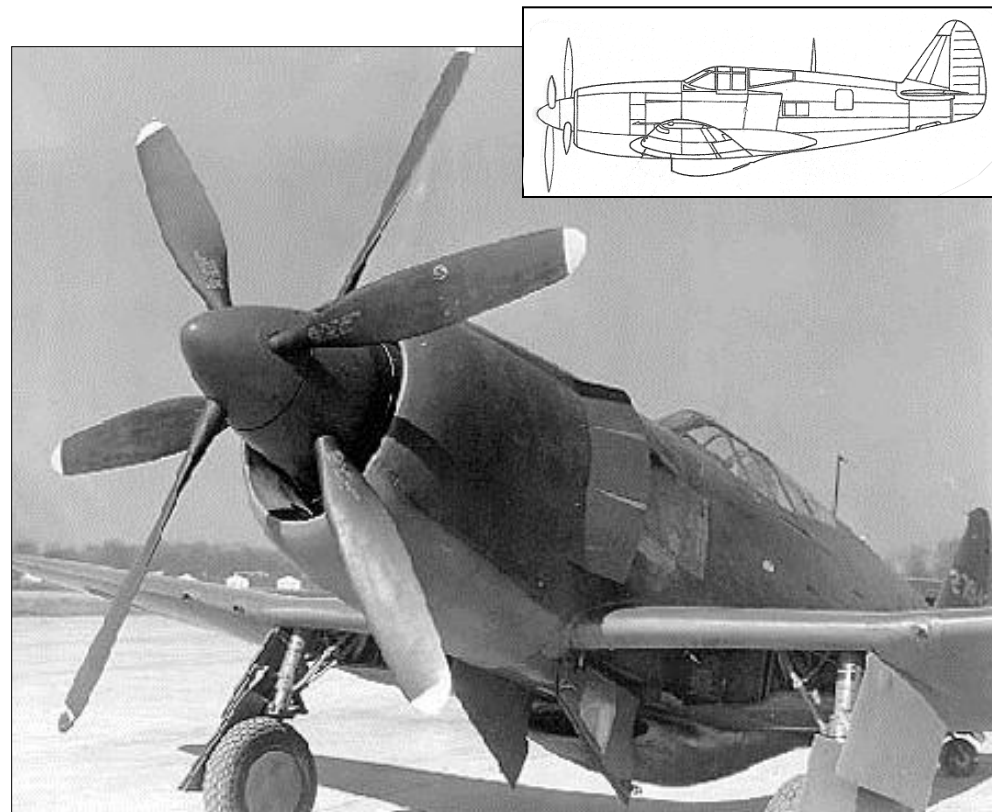
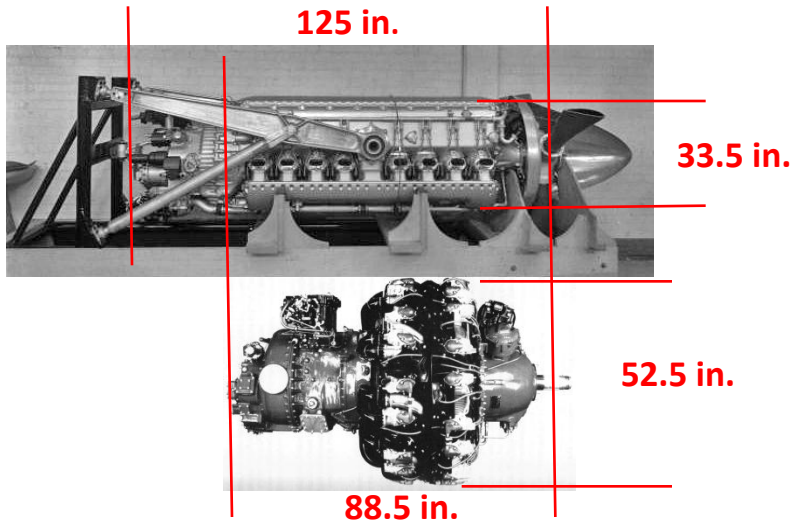
Wingspan: 41 feet, 3.75 inches

Weight (max): 11,835 lbs.

First flight: January 27, 1943

Engine: Pratt & Whitney R-2800-53, 2,300 HP

Props: Curtiss-Electric, 11 ft. 8 in. dia.



Curtiss XP-62

1943

Prototype high altitude Army fighter; pressurized cockpit, heavy, poor performance, few flight hours

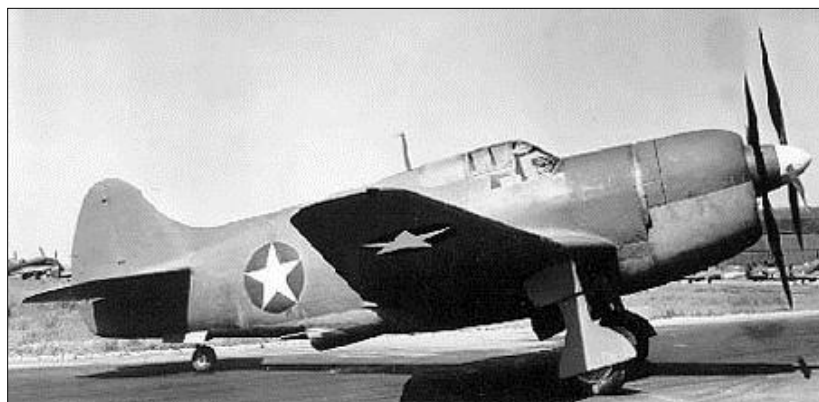
Wingspan: 53 feet, 7.75 inches

Weight (max): 16,650 lbs.

First flight: June 27, 1943

Engine: Wright R-3350-17 + turbocharger, 2,300 HP

Props: Curtiss Electric, approx. 12 ft. 10 inches



Curtiss XF14C-2

1943

Prototype naval fighter originally intended to use Lycoming H-2740-4. Prop vibration plagued the a/c

Wingspan: 46 feet

Weight (max): 14,950 lbs.

First flight: September, 1943

Engine: Wright XR-3350-16 + turbo, 2,300 HP

Props: Curtiss Electric, approx. 12 ft. 10 inches



Spitfire Contra-prop Experiments

1943 onward

Both the Merlin and Griffon Spitfires of various Marks were used for experimental and prototype work, including the development of contra-rotating propellers. The aircraft included here are not comprehensive, and multiple combinations of airframe, engines, propellers (Rotol or de Havilland), wings, and armament packages makes an interesting subject by itself.

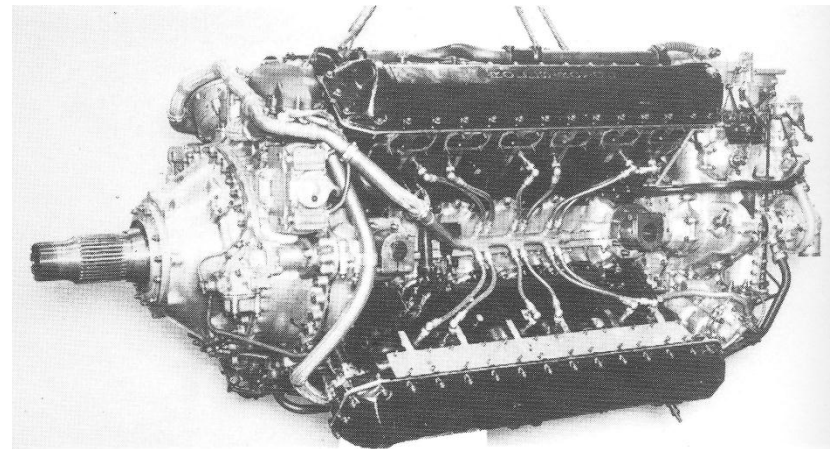
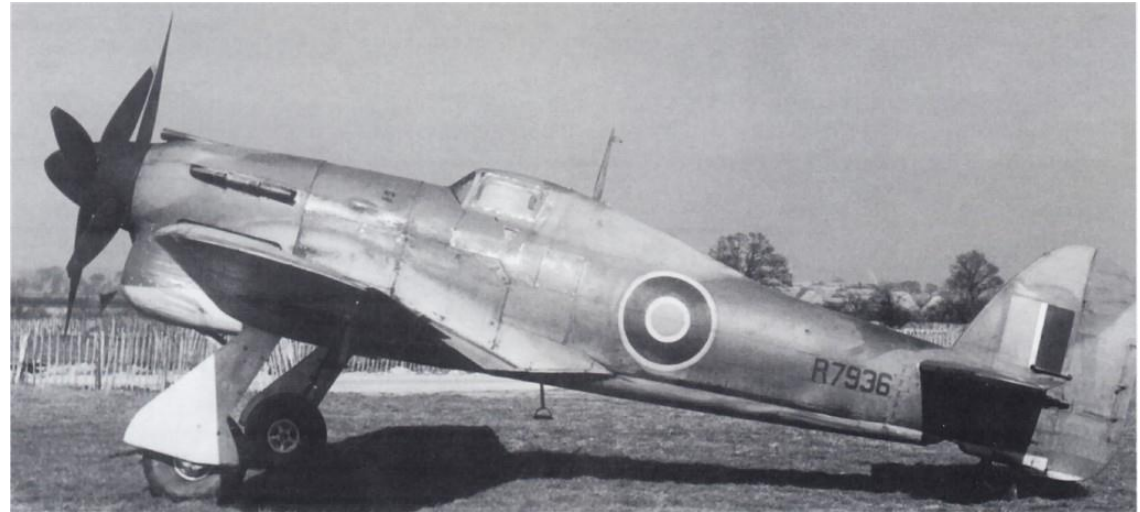


Hawker Tornado

1943

The Hawker Tornado was intended to replace the venerable Hurricane, but fell victim to intractable engine problems. Three prototypes and one production aircraft (R7936) were built, all by Avro, before the program was halted. Both de Havilland and Rotol props were evaluated (Flight reports: #842 by PG Lucas, #905 by W. Humble). Note the very short diameter of the de Havilland props shown here.

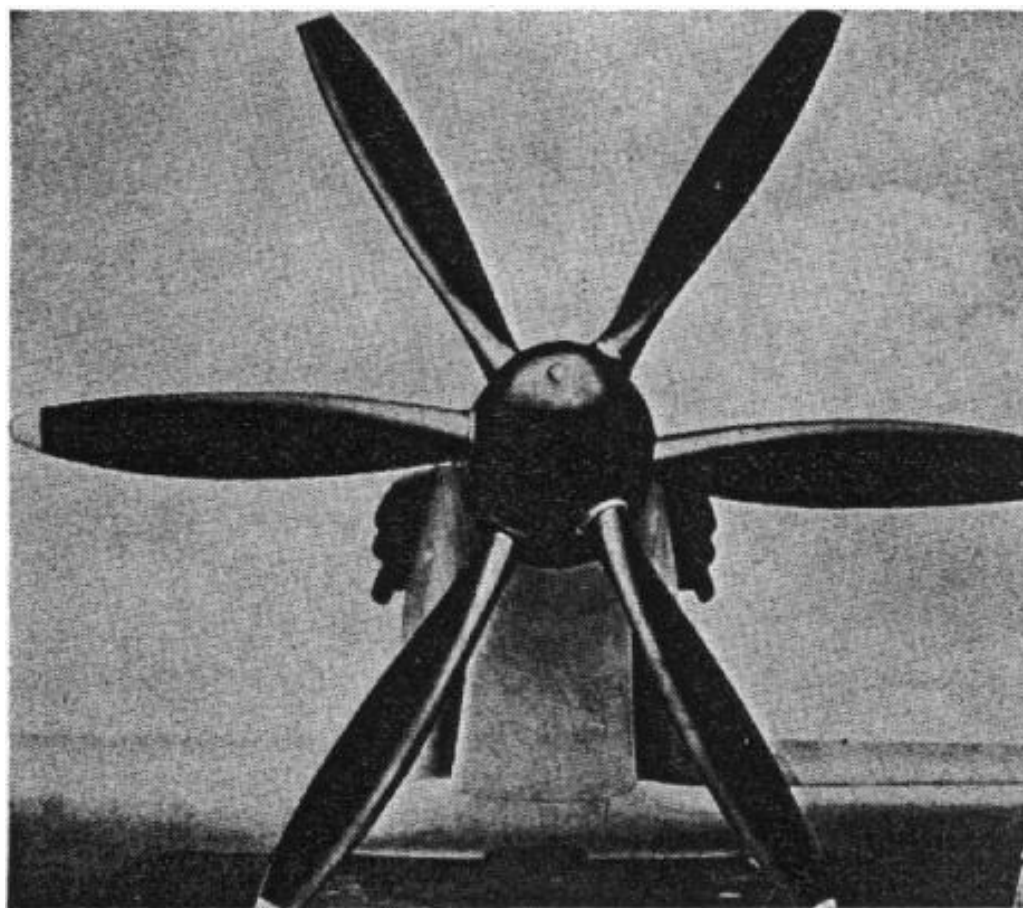
Wingspan: 41 feet, 11 inches
Weight (max): 10,668 lbs.
First flight: Oct. 6, 1939
C-prop: March, 1943
Engine: Rolls-Royce Vulture V,
X-24, 1,980 HP
Props: Both de Havilland and
Rotol



Hawker Hurricane

1943?

No other information beyond this single picture of a Hurricane wearing a de Havilland contra-prop assembly has been unearthed. This is most likely a 1940's "Photoshop" creation for propaganda purposes and not an actual flying aircraft



British DeHavilland prop on a Hurricane.

Fisher XP-75 / P-75A Eagle

1943

Prototype very long range fighter escort. Eight XP-75 prototypes and 5 production P-75A aircraft were built. Due to pilot error, aerodynamic, and performance issues, three P-75A aircraft crashed and the program terminated in November of 1944.

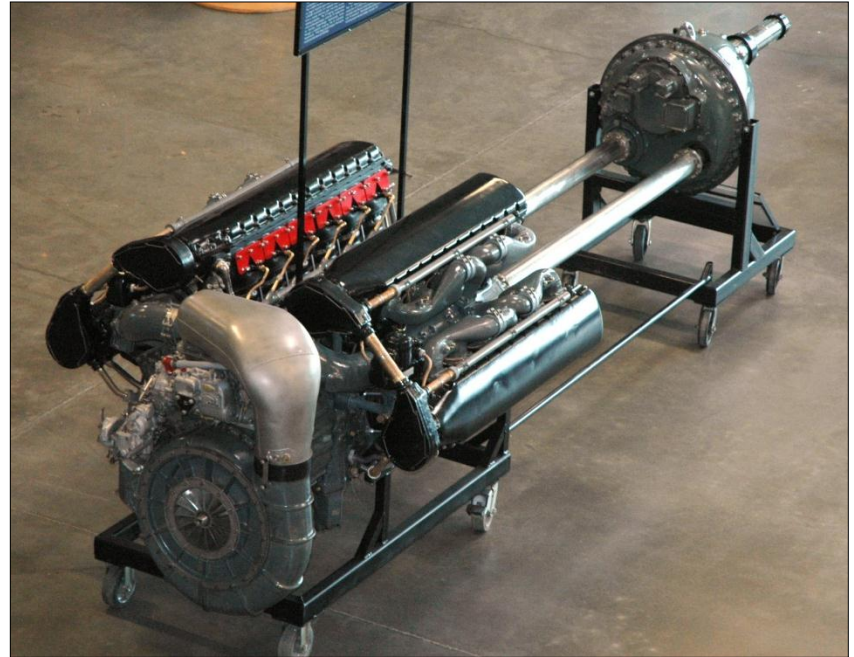
Wingspan: 49 feet, 1 inch

Weight (max): 25,000 lbs.

First flight: XP-75: Nov. 17, 1943 XP-75A: Sept. 15, 1944

Engine: Allison V-3420-23, 2,600 HP

Props: Aeroproducts AD7562-X5, 13 feet 1 inch diameter, activity factor =100, weight 782 lbs.



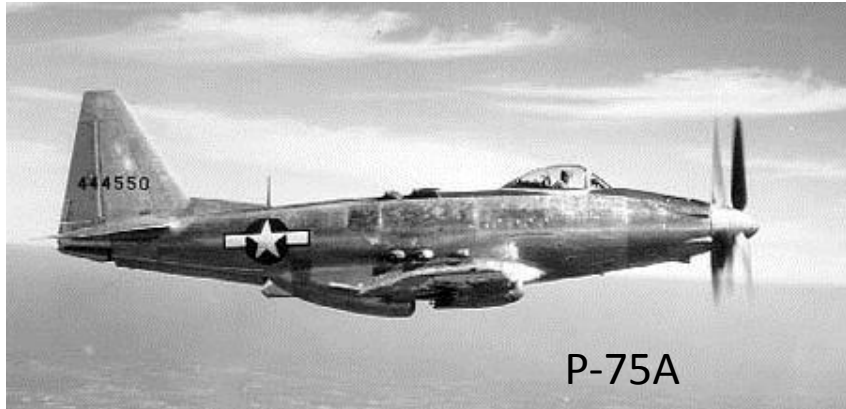
P-75A



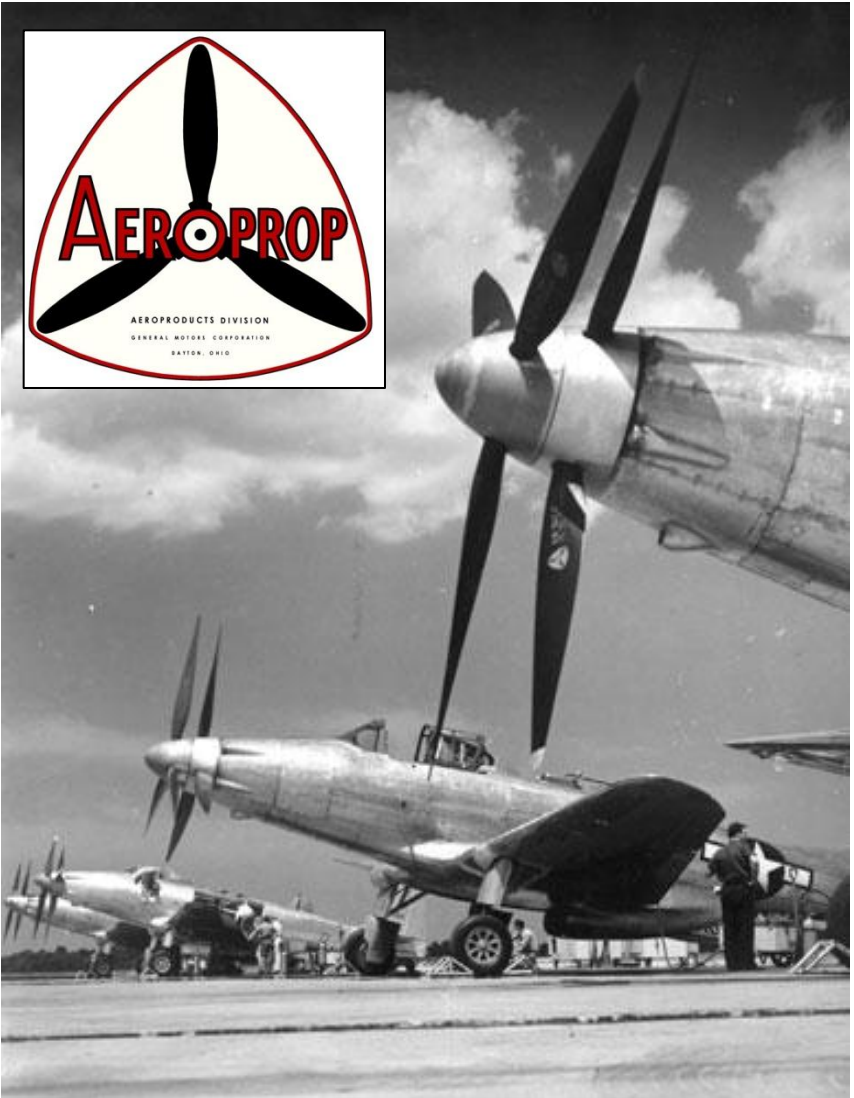
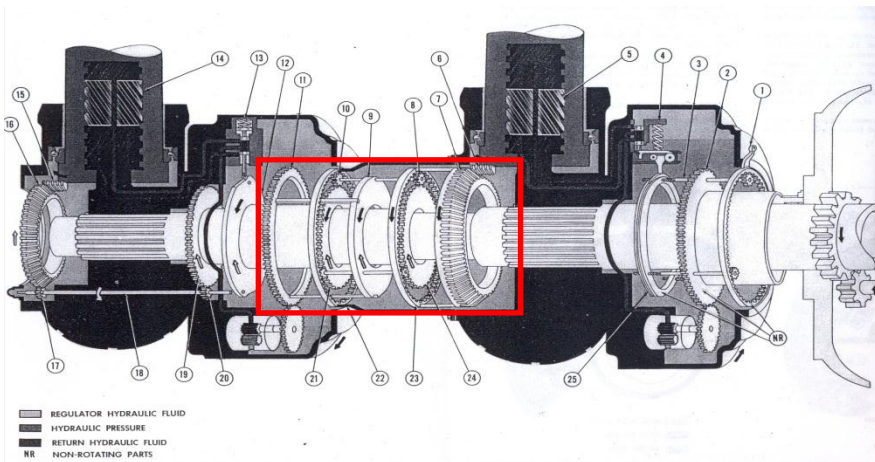
P-75A



XP-75



P-75A



AeroProducts AD7562: Each hydraulic unit is self-contained; pitch change from aft prop is signaled to fore unit by **coordinator assembly**

Northrop XP-56

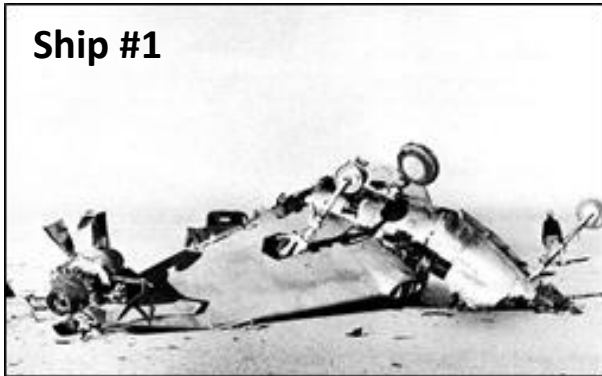
1943

Experimental flying wing fighter built of magnesium. Prop-ground clearance could be as little as 3.75 inches. In addition to many aerodynamic and stability issues, repeated breakage of the pitch change linkage between the two prop sets plagued the program

Ship #1



Ship #1



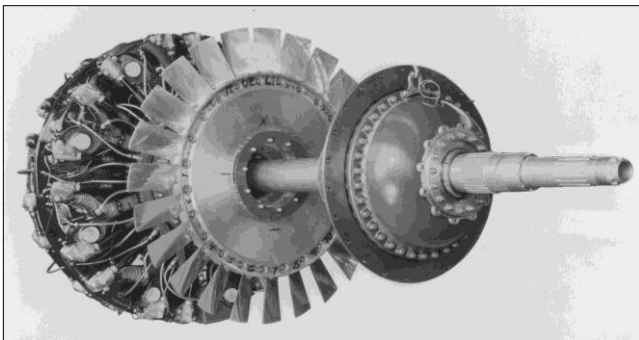
Ship #2

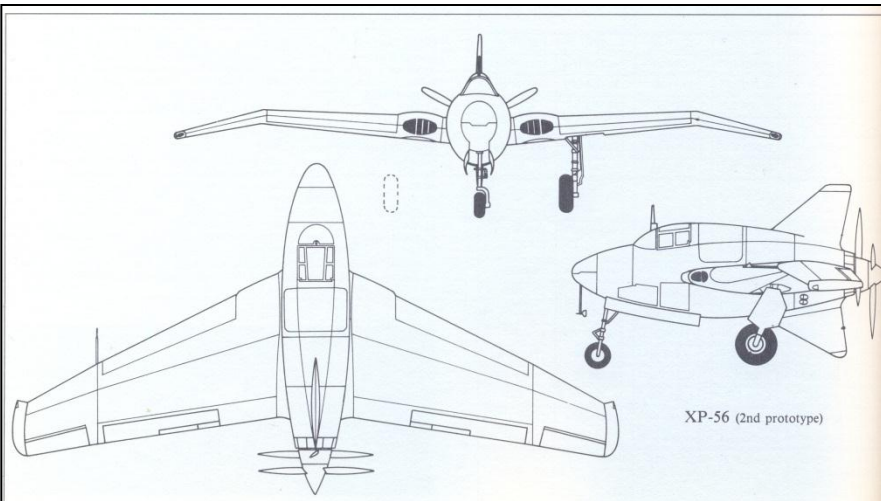
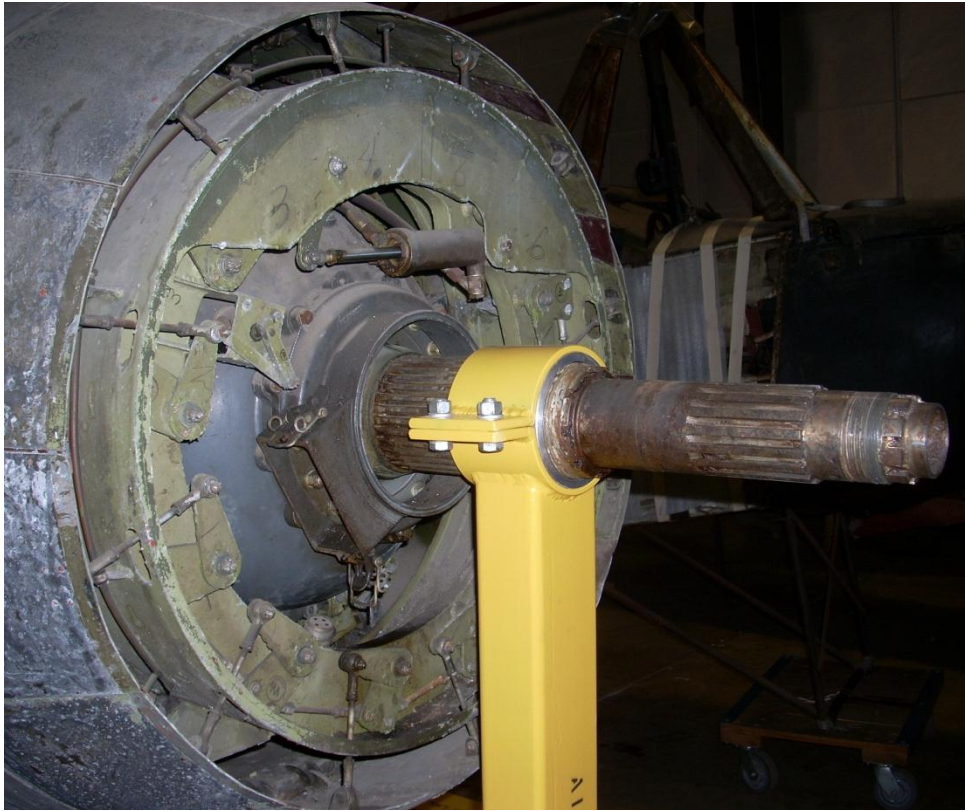


Wingspan: 42 feet, 7 in.
Weight (max): 11,350 lbs.

First flight: Sept. 6, 1943
Engine: P&W R-2800-29;
2,000 HP

Propellers: Curtiss-Electric, full-feathering, hollow steel blades, jettisonable. Fore prop: 9 feet 8 inches dia.; aft prop: 9.5 foot dia.



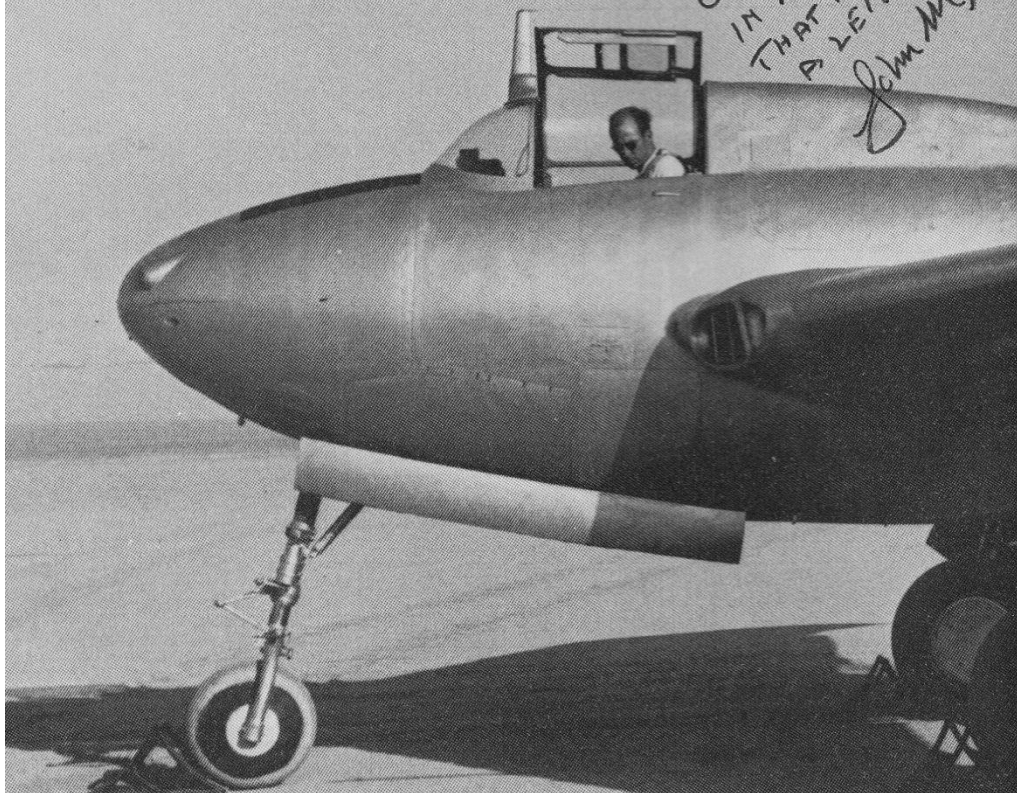


THE BLACK BULLET

Right Out Of The Comic Strips Of The Early Forties, With A Name To Match, Northrop's Radical XP-56 Pusher Fighter, Was Also Known As Dumbo And Bumblebee In Reference To Its Dubious Flying Qualities!

By Terry L. Sunday

Tom -
Both Jack Northrop
AND I KNEW THAT
THE AIRPLANE HAD
BEEN FORCED TO
CHANGE SO MUCH
IN DEVELOPMENT
THAT IT WAS
A LEMMEN
John Myers



Tom-

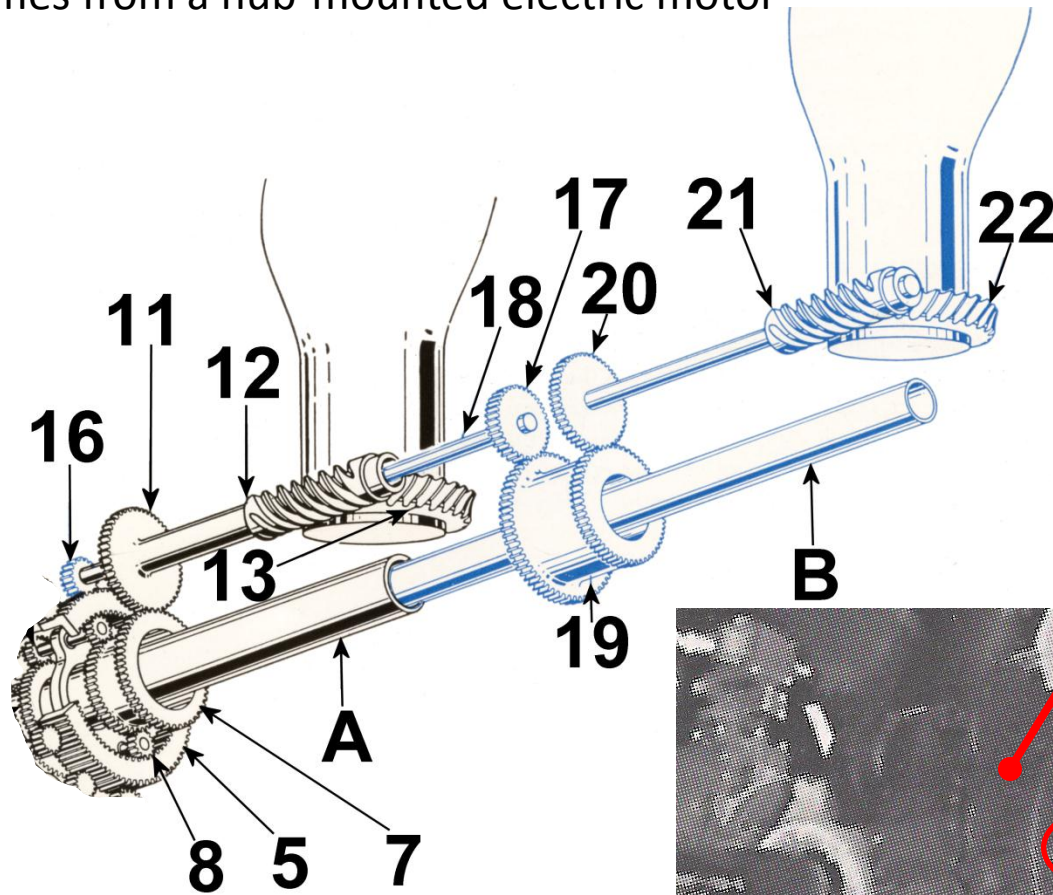
Both Jack Northrop and I knew that this airplane had been forced to change so much in development that it was a lemman.

John Myers
Northrop test pilot
July 2005



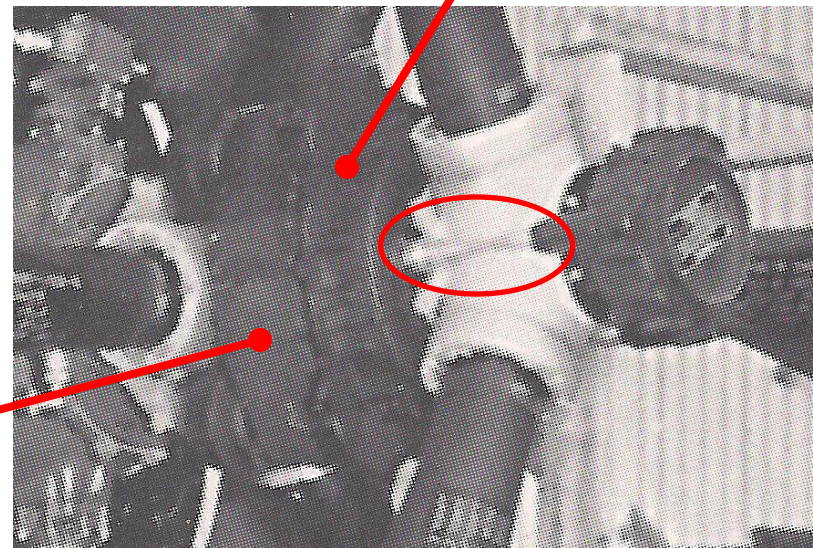
Curtiss Electric Contra-Prop Control Mechanism

Actuation principle is similar to the German single rotation VDM propeller, except drive power comes from a hub-mounted electric motor



Contra-rotation pitch change gear set unit

Hollow-armature electric pitch change motor and speed reduction unit



Republic P-47B

1943? 1944?

There is some uncertainty whether this aircraft was actually built and flown, however a single undated picture supports that a contra-prop P-47 did achieve flight. Pratt & Whitney likely had developed the appropriate contra-rotating prop reduction gear by Spring of 1942 when P-47B's began to roll off the assembly line.

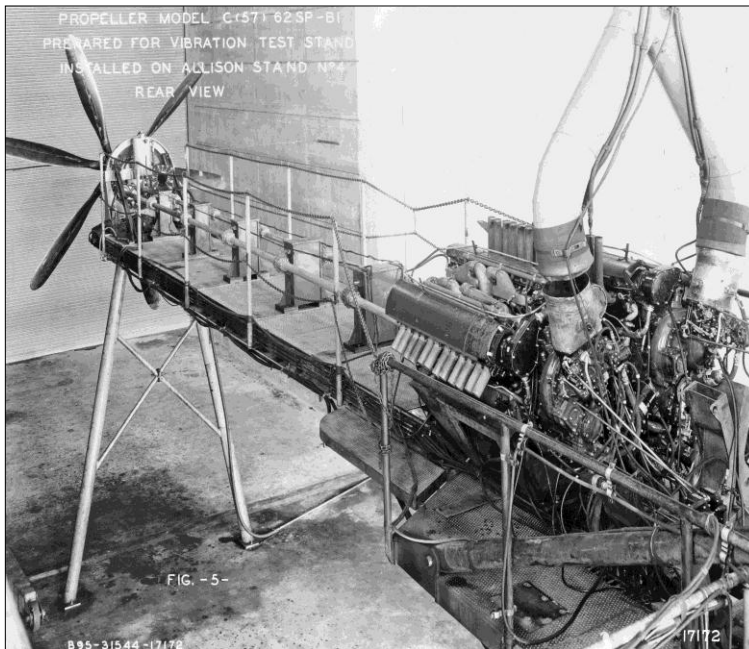
Wingspan: 37 feet, 3.5 inches Weight (max. takeoff): 13,360 lbs. First flight (XP-47B): May 6 1941
Engine (P-47B): Pratt & Whitney R-2800-21, 2,000 HP Props: Most likely Curtiss-Electric



Douglas XB-42 / XB-42A

1944

The XB-42 was an attempt to meet the job requirements of a B-17 using two engines and a crew of 3. Twin V-1710's transmitted power through 29 foot long, 6 piece shafting to a reduction gearbox and pusher contra-props. Each prop was driven by one engine. Both props were able to feather independently; aft prop was reversible. Props and gearbox could be jettisoned. One XB-42 crashed, second went on to be supplemented with jet pods (XB-42A), and third airframe was used to make the first US jet bomber (XB-43).



Wingspan: 70 feet, 6 inches

Weight (max): 35,702 lbs. (XB-42); 39,000 lbs. (XB-42A)

First flight: May 6, 1944

Engine: Two Allison V-1710-103 (E23), 1,820 HP @ WEP (XB-42); + two Westinghouse XJ-30 jet engines of 1600 lbs. thrust (XB42A)

Props: Curtiss-Electric, hollow steel blades, 836-17C2-18 (fore; 13 foot, 2 inch diameter, #70 spline) and 837-17C2-18 (Aft, 13 foot diameter, #50 spline)



XB-42A



XB-42



XB-42A



XB-42A



Republic XP-72

1944

In an effort to maximize the performance of the P-47 Thunderbolt, a 3,000 HP R-4360 with spinner-mounted cooling fan was installed in one of the most beautiful cowlings ever made. A massive first stage supercharger was to be mechanically driven. Ship #1 flew behind a 14 ft. single rotation Curtiss prop, while Ship #2 had a short life driving contra-props. The performance of both prototypes, though outstanding, was insufficient to justify interruption of standard P-47 production.

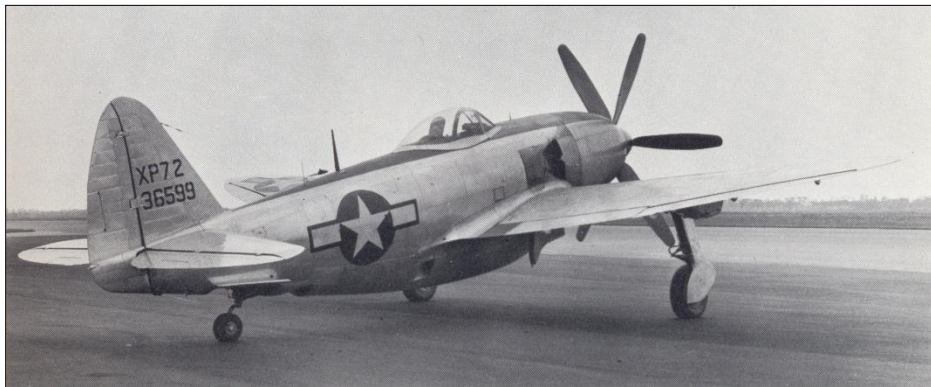
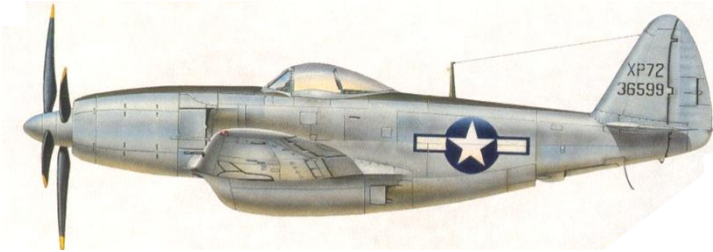
Wingspan: 40 feet, 11 inches

Weight (max): 17,492 lbs.

First flight: June 26, 1944 (Ship #2)

Engines: P&W R-4360-3, 3,000 HP

Propellers: Aero products AD7562-X14, 13 feet 7 inches diameter, hollow steel blades



Chance-Vought F4U-1, XF4U-4 Corsair

1944

At least two F4U Corsairs were evaluated with either Aero products (XF4U-4) or Hamilton-Standard (F4U-1) Super-Hydromatic contra-props. Reports say the Aero prop Corsair suffered in top speed (10 mph slower), initial climb (300 fpm reduction), and weight (+203 lbs.) compared to the standard, single rotation, 4 blade unit. No information beyond the picture for the F4U-1

Wingspan: 40 feet, 11 2/3 inches (F4U-1A)

Weight (takeoff): 12,694 (max.)

First flight: Aero prop; June-August 1944

Engine: Pratt & Whitney R-2800-8, air-cooled, 18 cylinder, 2,000 HP

Props: Aero products AD-7562-X5 of 12 foot 7 inches diameter weighing 864 lbs. or Hamilton-Standard of rather short but unknown diameter with hydraulic actuation



Hawker Fury MK 1 / Tempest III

1944

The Hawker Fury (LA610) was a prototype aircraft that evolved from the Tempest/Typhoon series which further developed into the Centaurus-powered Hawker Sea Fury. This particular airframe was eventually fitted with Napier Sabre VII engine and reached airspeeds in the vicinity of 485 mph.

Wingspan: 34 feet, 11 inches (FB 11)

Weight (max): 12,500 lbs. (FB 11)

First flight: Nov. 27, 1944 (LA610 w/ c-prop)

Engine: Rolls-Royce Griffon 85, V-2240, 2,375 HP

Props: Rotol 35 degree contra-prop



Boeing XF8B-1 (Model 400)

1944

American "Five-in-one" carrier based fighter bomber had an internal bomb bay. Three prototypes produced. Propeller control (overspeeding) was a continuing issue, and performance in ground attack was rated inferior to the P-47 or P-51. Test pilot Bob Lamson (155 hrs. in XF8B-1) tried to obtain an XF8B-1 for post war air racing, but the Navy would not release the aircraft.

Wingspan: 54 feet Weight (max): 22,960 lbs.

First flight: Nov. 27, 1944

Engine: Pratt & Whitney R-4360-10, 3,000 HP

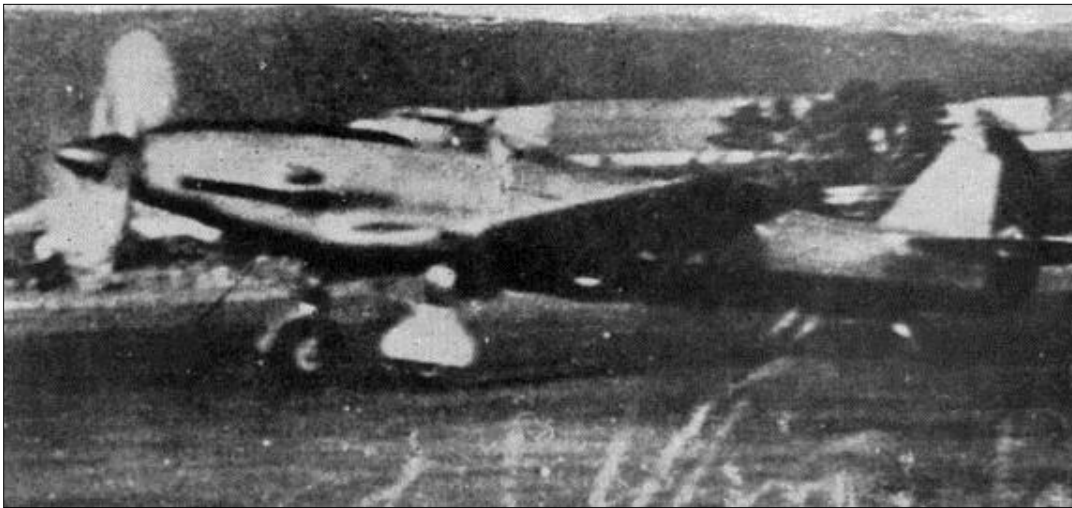
Props: Aero products AD7562-X8, 13 foot, 5 11/16 inch diameter contra props. 13.5 inches between blade sets,



Kawasaki Ki.64 "Rob"

1944

The Ki.64 was a Japanese experimental high speed heavy fighter that used evaporative surface cooling of two tandem engines each driving a contra-rotating prop. The fore prop had hydraulically controllable pitch and was driven by the rear engine, while the aft prop was fixed pitch and driven by the front engine. The aft engine used collector exhaust manifolds on each side which exited through a shrouded port at the trailing edge of both wing panels. During the 5th flight, a rear engine fire grounded the aircraft which was under repair at the war's end.



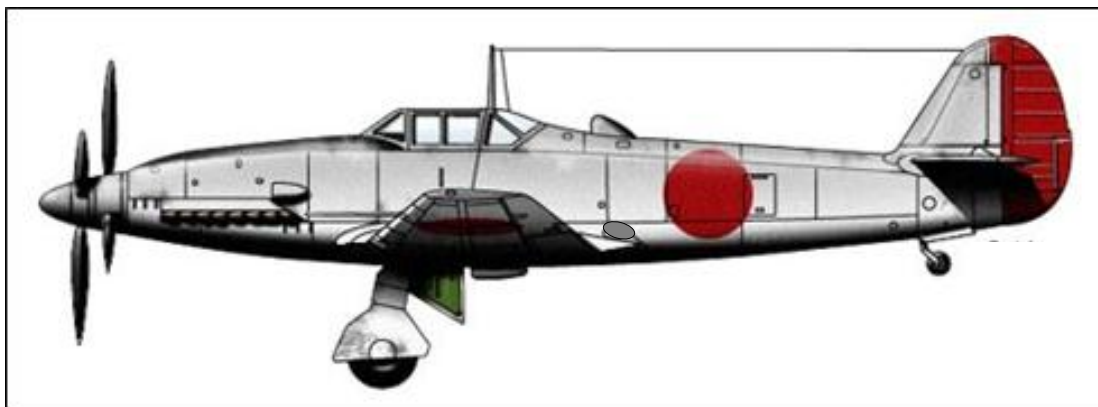
Wingspan: 44 feet 2.25 inches

Weight (max): 11,244 lbs.

First flight: December 1944

Engine: Kawasaki Ha-201 (dual
Kawasaki Ha -40 V-12's), 2,350 HP
total

Props: Manufacturer unknown; fore
prop adjustable pitch, aft prop fixed
pitch, approx. 10 feet in diameter

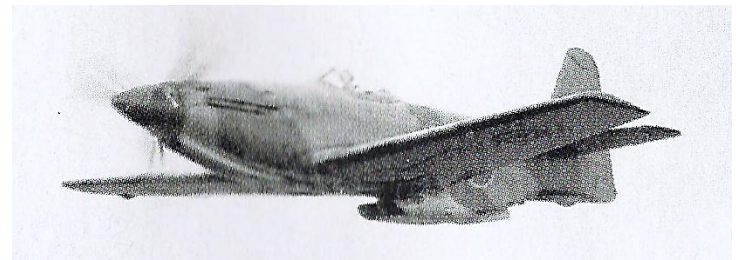
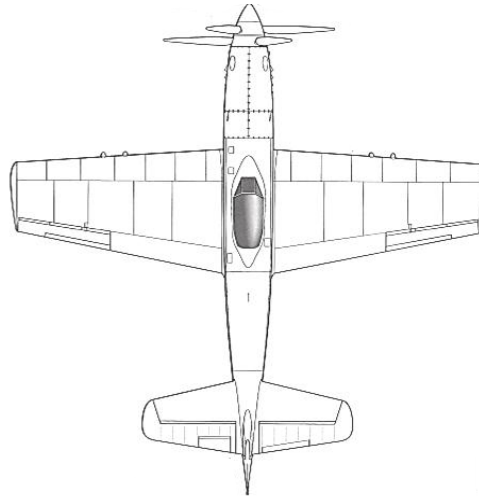


Martin-Baker M.B.5

1944

The M.B.5 was close to the ultimate piston-engined fighter. With a powerful engine, a small, laminar wing (44 lbs/sq. ft. loading), easily accessible systems, and wide track gear, the aircraft was a wonderful performer. It is believed the relatively late date of the first flight, Martin-Baker's lack of manufacturing capacity, engine/propeller vibration, and the limitations of any propeller in the coming age of jet aircraft limited the fighter to this single, spectacular prototype. A replica is under construction.

Wingspan: 35 feet
Weight (max): 11,500 lbs.
First flight: May 23, 1944
Engine: Rolls-Royce Griffon
83, V-2240, 2,340 HP
Props: de Havilland,
constant speed, 12 feet 6
inches diameter



johnmarlinsmb5replica.mysite.com



Douglas XTB2D-1 Sky Pirate

1945

Monstrous P&W R-4360 powered naval torpedo bomber prototype. Differential diameters on props is noteworthy with larger diameter in the aft position, which is contrary to some other applications where the fore propeller has the larger diameter.

Wingspan: 70 feet

Weight (max): 34,760 lbs.

First flight: March 13, 1945

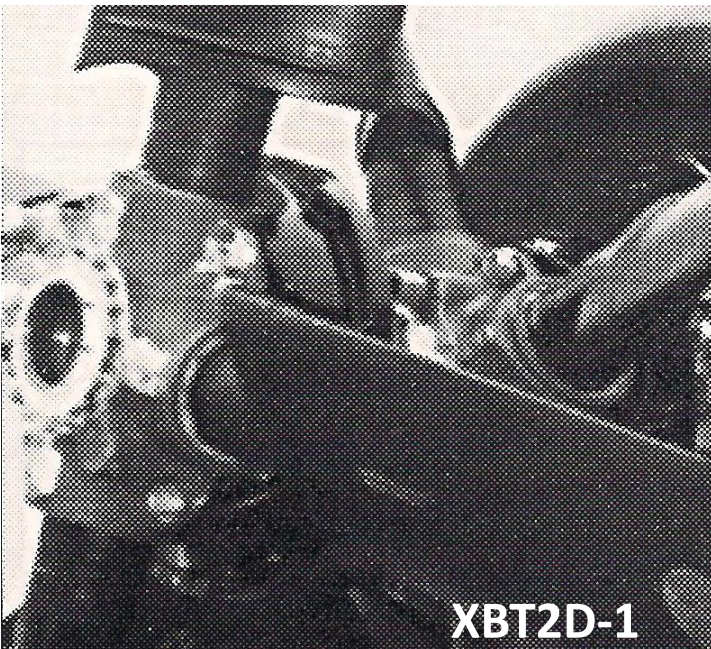
Engine: Wright R-4360-8, 3,000 HP

Props: Hamilton-Standard Super Hydromatic, blades #2C15B1-12 (front; 14 ft. 1 in dia.), 2C15B2-12 (aft; 14 foot, 3 in diameter)

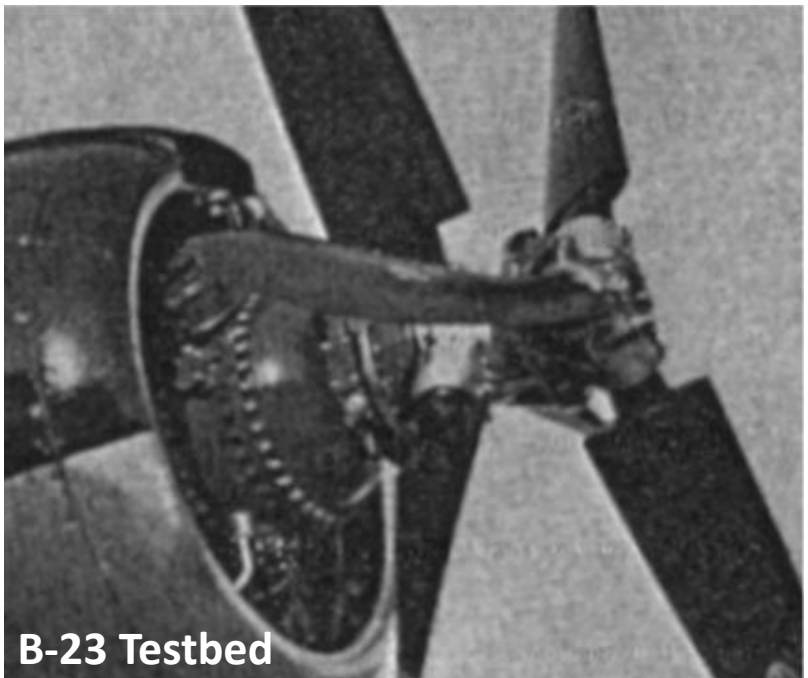


Hamilton-Standard Super Hydromatic Contra-Rotating Propellers

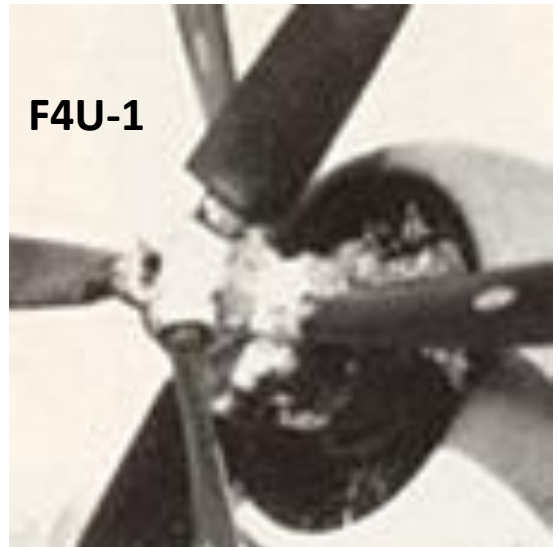
Experimental units used on XB-35, XF-11 (#1), XTB2D-1, F4U-1, and B-23 test bed



XBT2D-1



B-23 Testbed



F4U-1

The XB-35 pilot manual mentions the Super-Hydromatic and describes the use of a single control unit, vane pumps, solenoids, and a translating bearing, but details of actuating mechanism and control remain incomplete

