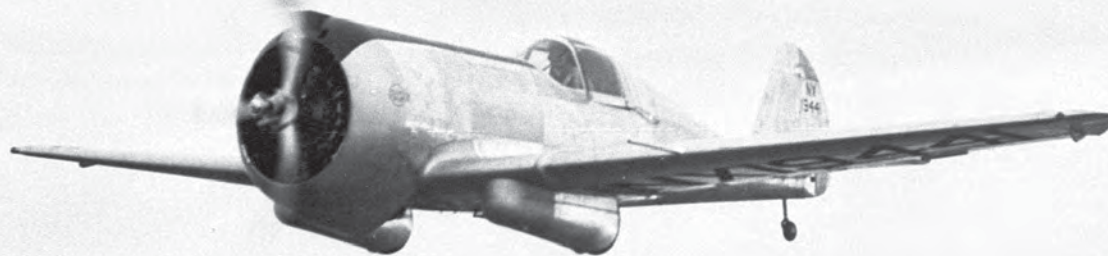




CURTISS-WRIGHT CW-21

INTERCEPTOR



CW-21 INTERCEPTOR

This sleek looking CW-21 with civil registry NX19441 was one of three destined for China. It first flew on 20 March 1940.

(collection E. Hoogschagen)

Previous page:

A publicity photo dated 1 December 1940. The CW-21 was pitched as the mile a minute fighter, the ideal fighter for intercepting high flying enemy bombers. Seen here is a CW-21B prior to delivery to the Netherlands Indies.

(collection M. Willis)



INTRODUCTION

During the early stages of the Sino-Japanese war, which had erupted in July 1937, it quickly became apparent that the Chinese air force urgently required modern fighter aircraft which combined a high rate of climb with superior manoeuvrability.

The Central Aircraft Manufacturing Company (CAMCO), founded by American William Douglas Pawley, had assembled a series of Curtiss Hawk II and III fighter planes for the Chinese Nationalist government. Pawley was also president of Intercontinental Corporation, this company was sales representative for Curtiss-Wright in China during the second half of the 1930s. The strong ties between Pawley and Curtiss-Wright were the stepping stone for development of a new light weight fighter which would meet the demands of modern air war.

The CW-21B featured an inward retracting landing gear and other refinements. It first flew mid-September 1940.

(collection J. Grismich)

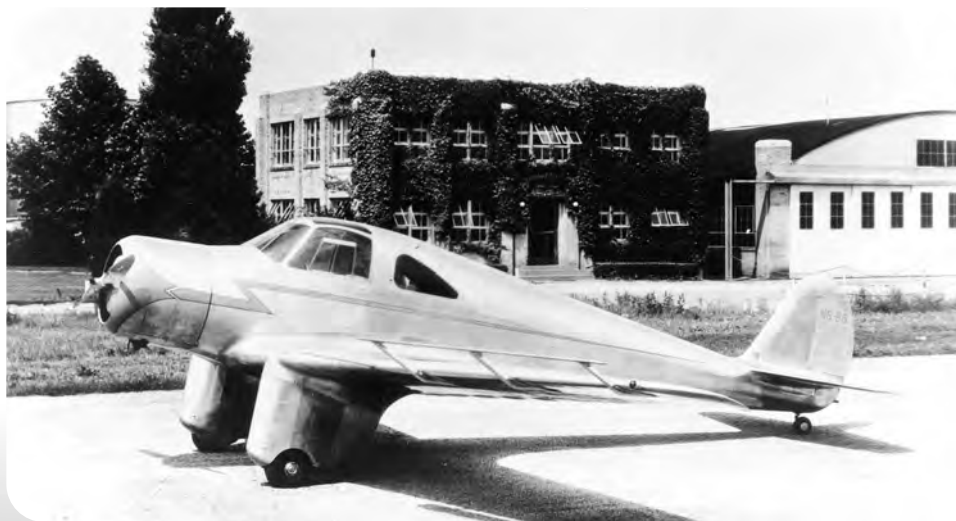
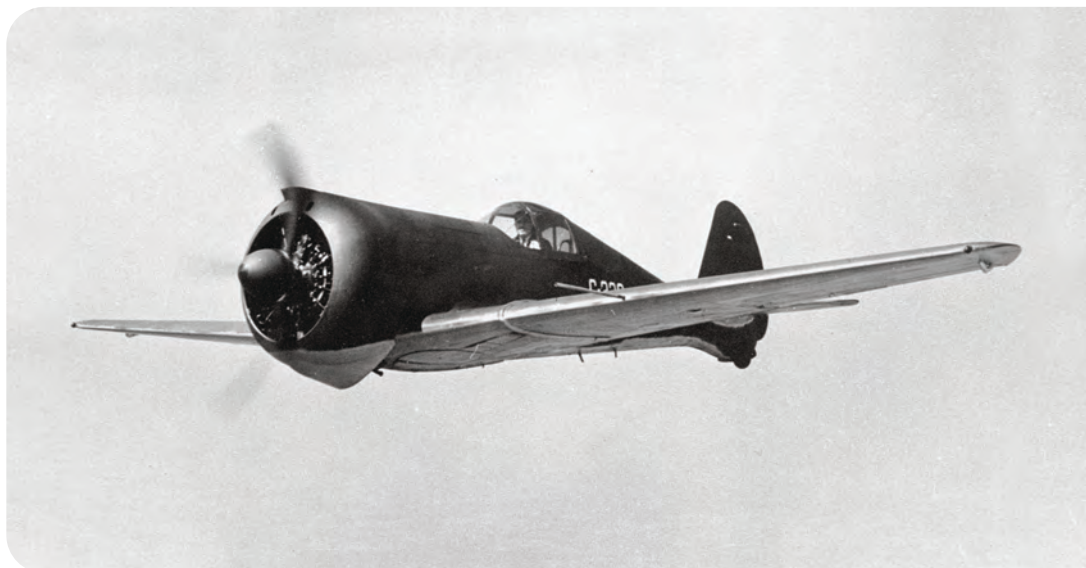
DEVELOPMENT

Work on this new fighter type started in the St. Louis branch of the Curtiss-Wright Company. The most important design philosophy was to employ a high power engine combined with an airframe as light and compact as possible. The design team, led by Willis Wells (project engineer) and George A. Page jr. (chief engineer), drafted a design which would evolve into the CW-21 fighter.

Right:

The Curtiss-Wright CW-19L was the company's first all metal aircraft design and paved the way to other designs, including the CW-20 transport and CW-21 fighter.

(collection N. Braas)



Curtiss-Wright chief designer George A. Page jr., in front of a CW-25, the AT-9 Jeep advanced trainer.

(Missouri historical society collection)

THE CURTISS-WRIGHT COMPANY

The Curtiss-Wright company was formed on 26 June 1929 when the Curtiss Aeroplane and Motor Company merged with the Wright Aeronautical Corporation. The company was organised in an aircraft division (Curtiss) and a division constructing engines and propellers (Wright). The headquarters was located in New York City. During the years before the merger Curtiss had purchased the Keystone, Loening, Robertson, Travel Air and Moth companies, but these were all dissolved during the Great Depression of the 1930s. Production of some types were continued under the Curtiss-Wright company name at the St. Louis facilities – the former Robertson plant. Other businesses such as the Curtiss-Wright Flying service had to discontinue activities.

Above:

An aerial view of the Curtiss-Wright facilities at Lambert field, St. Louis. (Missouri historical society collection)

Bottom:

The Curtiss-Wright complex after completion of expansion work, December 1941. (Missouri historical society collection)



The completely redesigned CW-19R-12 advanced trainer, armed with two forward firing light machineguns.

(Missouri historical society collection)

The new fighter shared some design elements first used in the CW-19L, which was originally designed by the Curtiss-Robertson company as CR-2 Coupe, before this company was absorbed in the Curtiss-Wright company. The CW-19L was introduced in 1935 and was intended as private aircraft featuring side by side seats and streamlined fixed landing gear, covered with trouser type fairings. Although the CW-19L had unfavourable stall characteristics and a tendency to ground loop, it did have an excellent rate of climb – it reached 23,000 feet in 15 minutes. Many of its vices were solved after it received a completely redesigned wing. The design showed potential and it was redeveloped as tandem seater, intended for military use. This variant was known as CW-19R. Twenty were sold to China and small quantities were bought by Bolivia, Cuba, Dominican Republic and Ecuador.

The unarmed CW-19R advanced trainer in Ecuadorian markings. (collection E. Hoogschagen)



The completed CW-21 prototype, registered NX19431, made its first flight at Wright Field on 27 September 1938, piloted by Ned Warren. At this time, the US Army Air Corps showed no interest in the plane.

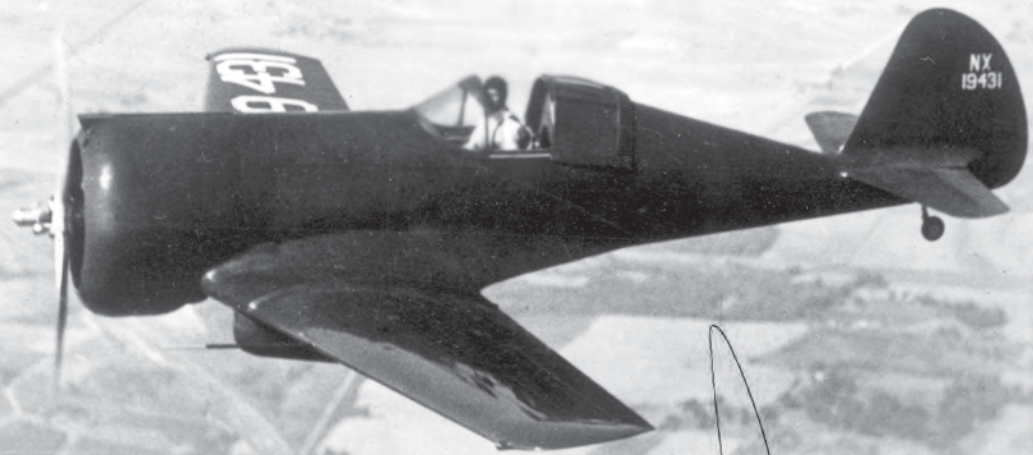
TECHNICAL DESCRIPTION

The CW-21 featured a very slim fuselage design with highly tapering tail section aft of the cockpit. The overall layout of wings and tail surfaces were similar to the CW-19R, although the wing surfaces for CW-21 were strengthened.

The monocoque fuselage was entirely made of aluminium. Armament – a pair of .30 machineguns with 1000 rounds each – was fitted behind the firewall and fired through the propeller arc. The pilot sat in a fully enclosed cockpit with rearward sliding canopy. A bulkhead constructed out of aluminium plate directly behind the pilot served as turnover column. The front was made out of ¼ In (6.3 mm) steel sheet and provided a limited armour protection for the pilot. The central wing section was bolted to the fuselage and held two fuel tanks of 34 gallons each. The main landing gear legs retracted rearwards into fairings

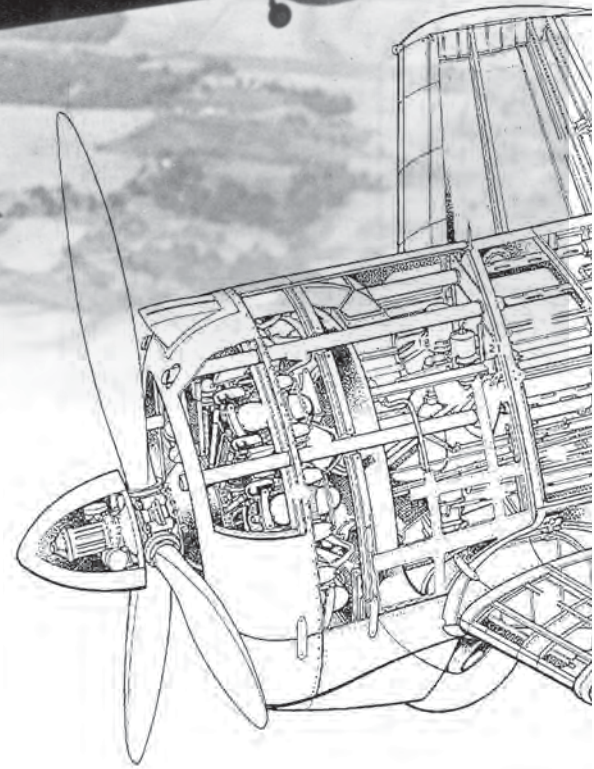


The all-green CW-21 prototype NX19431 in flight. (collection M. Willis)



underneath the wings and were hydraulically operated. The wing outer panels housed a further fuel tank of 14 gallons each – resulting in a total fuel capacity of 96 gallons. All-metal flaps were placed in

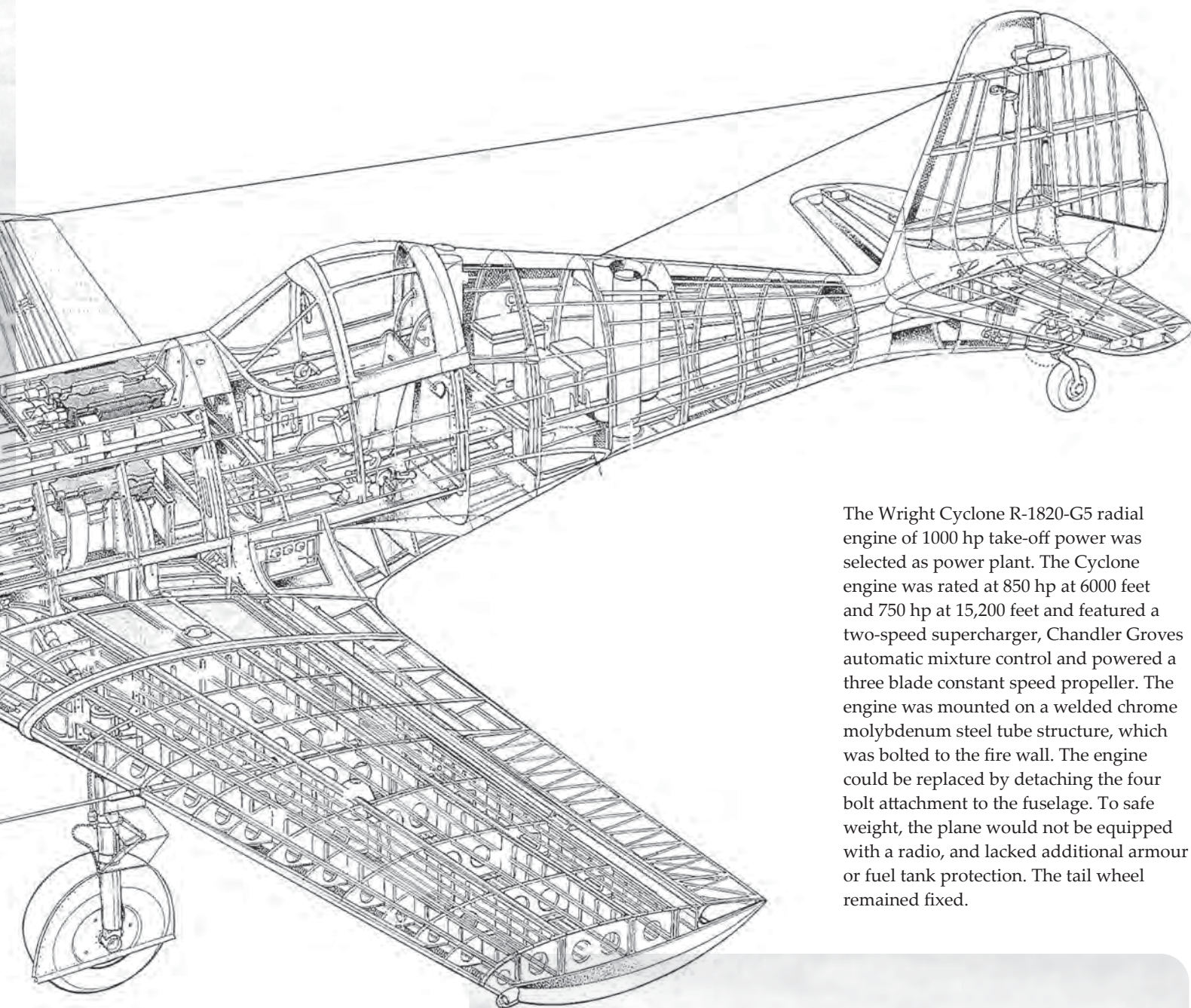
the wing centre section and outer wing panels. Flaps were operated manually and actuated with a chain drive. All control services were of all-metal construction and equipped with controllable trim tabs.



This side view reveals the strongly tapering tail design of the CW-21. The rearwards sliding cockpit hood was supported by an external guide rail. The aiming device, a simple ring sight, was attached to the top of the wind shield. (collection N. Braas)



The CW-21 prototype with registry NX19431. It was painted in an overall coat of green, most likely Dark Green shade 30. Profile art by Luca Canossa.



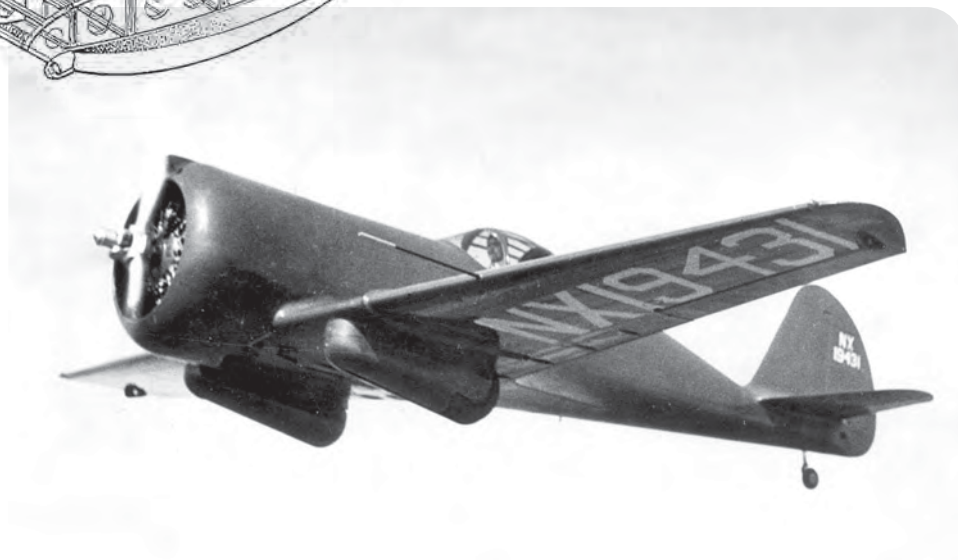
The Wright Cyclone R-1820-G5 radial engine of 1000 hp take-off power was selected as power plant. The Cyclone engine was rated at 850 hp at 6000 feet and 750 hp at 15,200 feet and featured a two-speed supercharger, Chandler Groves automatic mixture control and powered a three blade constant speed propeller. The engine was mounted on a welded chrome molybdenum steel tube structure, which was bolted to the fire wall. The engine could be replaced by detaching the four bolt attachment to the fuselage. To save weight, the plane would not be equipped with a radio, and lacked additional armour or fuel tank protection. The tail wheel remained fixed.

This exploded view of the CW-21B variant provides an impression of details such as armament lay-out and the fitting of the fuel tanks in the wing center section.

Right:

When retracted, the landing gear legs were covered by aerodynamic doors. Only the wheels protruded, which should minimize damage in a wheels-up landing.

(collection N. Braas)





Front view of the Pratt & Whitney R-1820-G5 engine. It was a standard civilian engine but was reliable and power was sufficient. The front view reveals the greater width of the starboard blast tube, suggesting that a .50 machinegun may have been fitted. (collection E. Hoogschagen)

This photo shows that the roof of the sliding hood was strengthened with four lengthwise frames. (collection T. Postma)





THE CW-21 'DEMON'

The CW-21 has been named Demon in many post-war publications. It has been commonly known like this for decades. But findings in Curtiss archive documents reveal that this is based on a misunderstanding of company data which was compiled in 1946. The CW-21 is mentioned in a listing of Curtiss-Wright designs. The root of the misunderstanding appears in a column with type names. The CW-21 is named Demon. (with a dot at the end). This was actually a reference to the purpose of the aircraft; it was a demonstrator. But a good fighting aircraft needs a name. The CW-21 was actually known as **Interceptor**, also in the Netherlands Indies. A much less appealing name compared to Demon...*

* As researched by Dan Hagedorn in the Museum of Flight archives, Seattle.

With the engine covers removed and armament bays opened, the armament of a single .30 and .50 machinegun is visible.

(collection M. Schep)

Bottom
The CW-21, piloted by Fausel.

(collection M. Schep)

THE MILE A MINUTE FIGHTER

The CW-21 was advertised by Curtiss-Wright as the mile a minute fighter, referring to its unmatched climb rate. Although the climb rate of the CW-21 was indeed impressive, an actual climb rate of 5280 feet/minute was never officially recorded. A climb rate of 4800 feet/minute was published in 1940.



A CW-21B in an attractive yet fictional Royal Air Force livery, as illustrated by subcontractor Thompson products.

