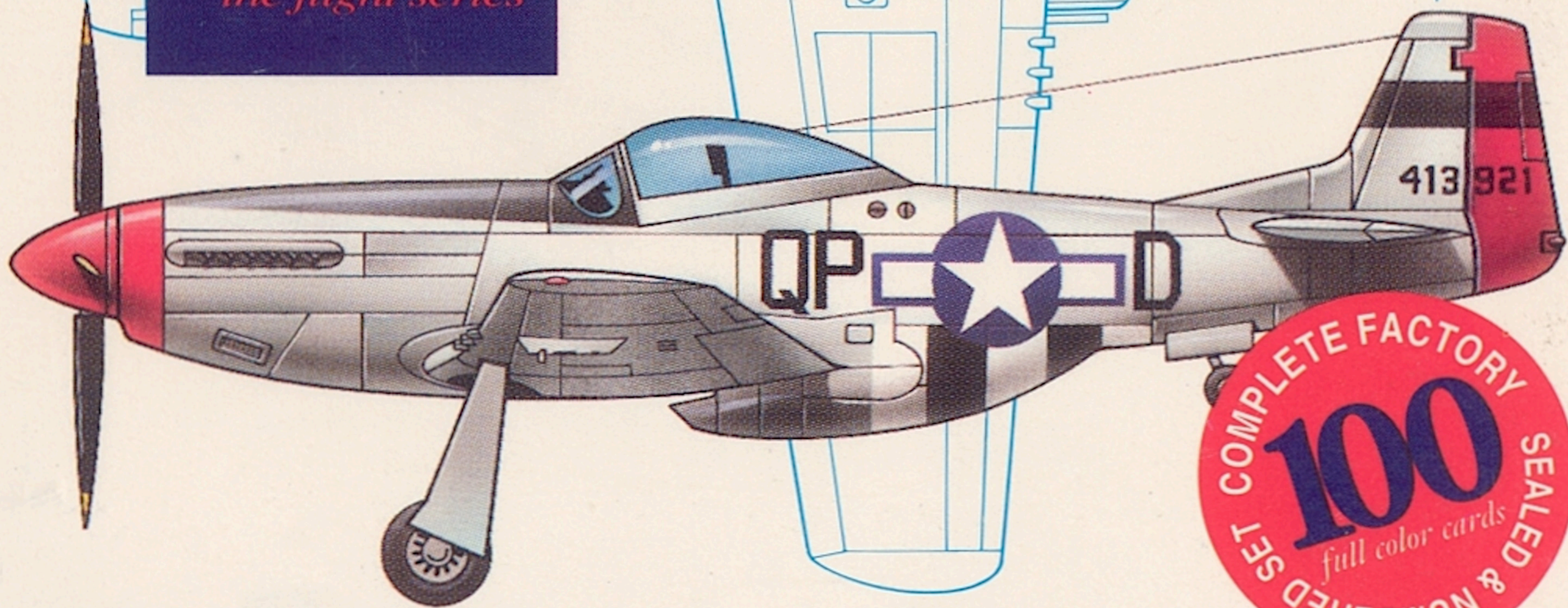


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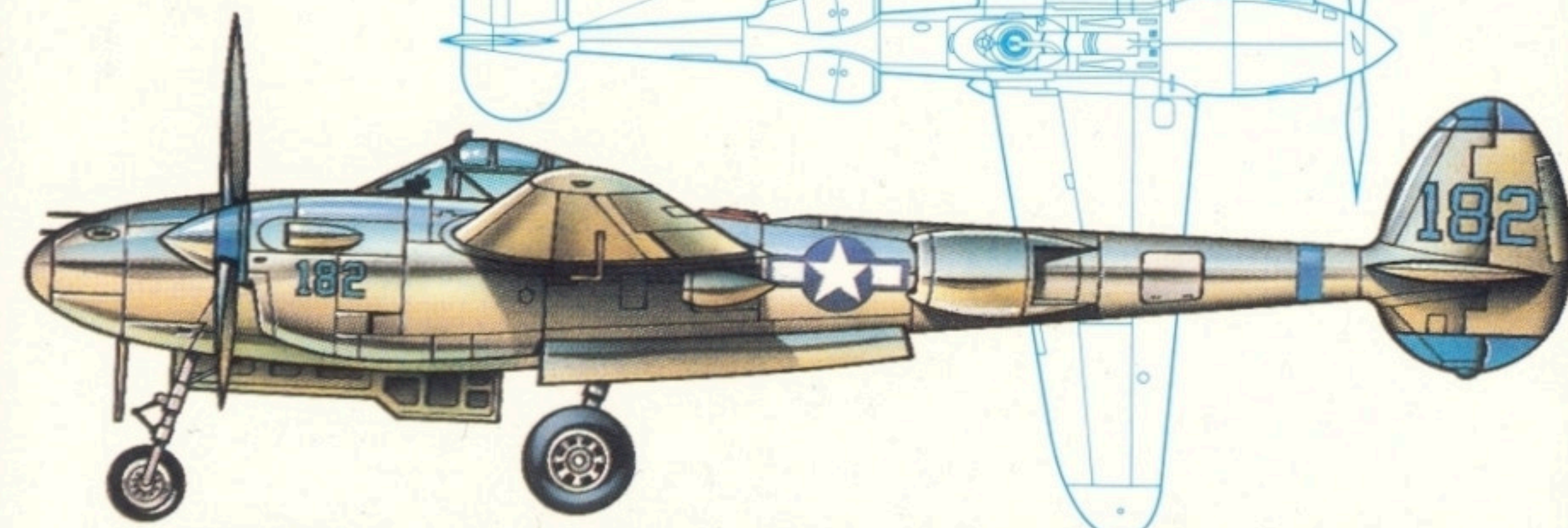

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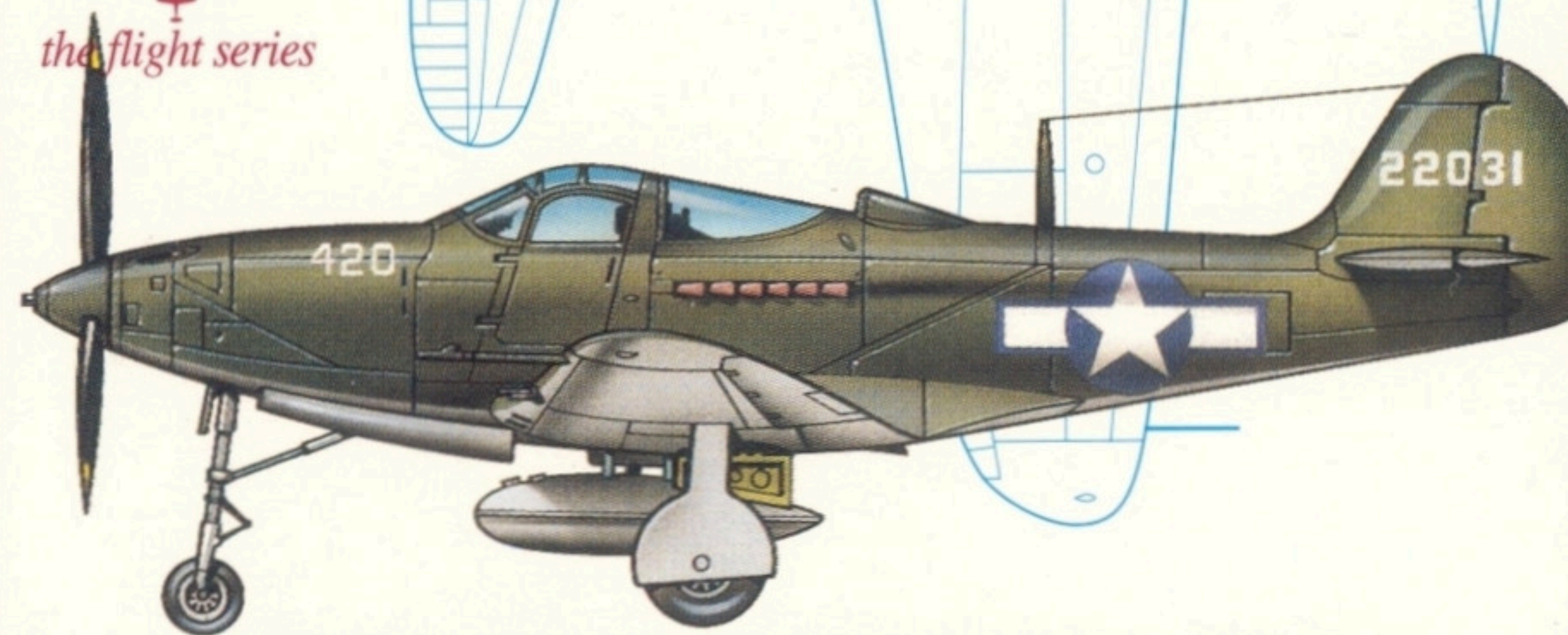
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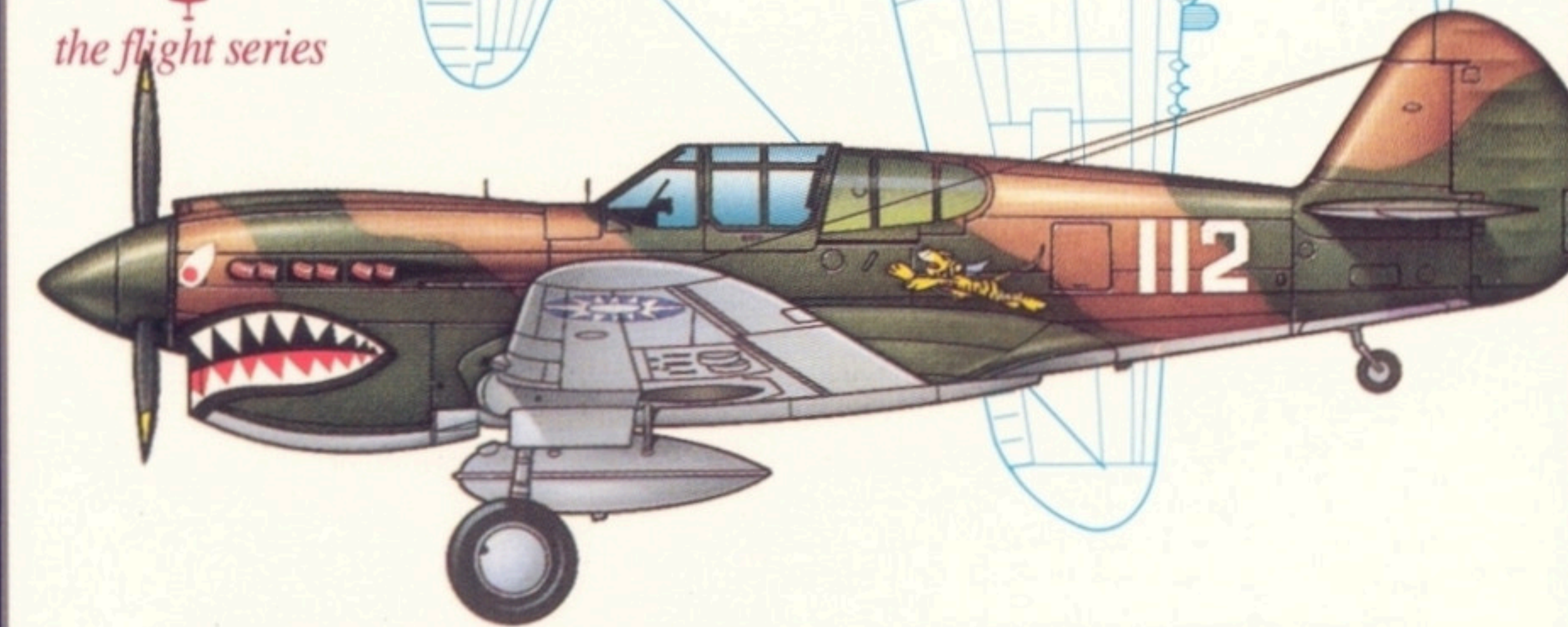
P-38J LIGHTNING

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the flight series



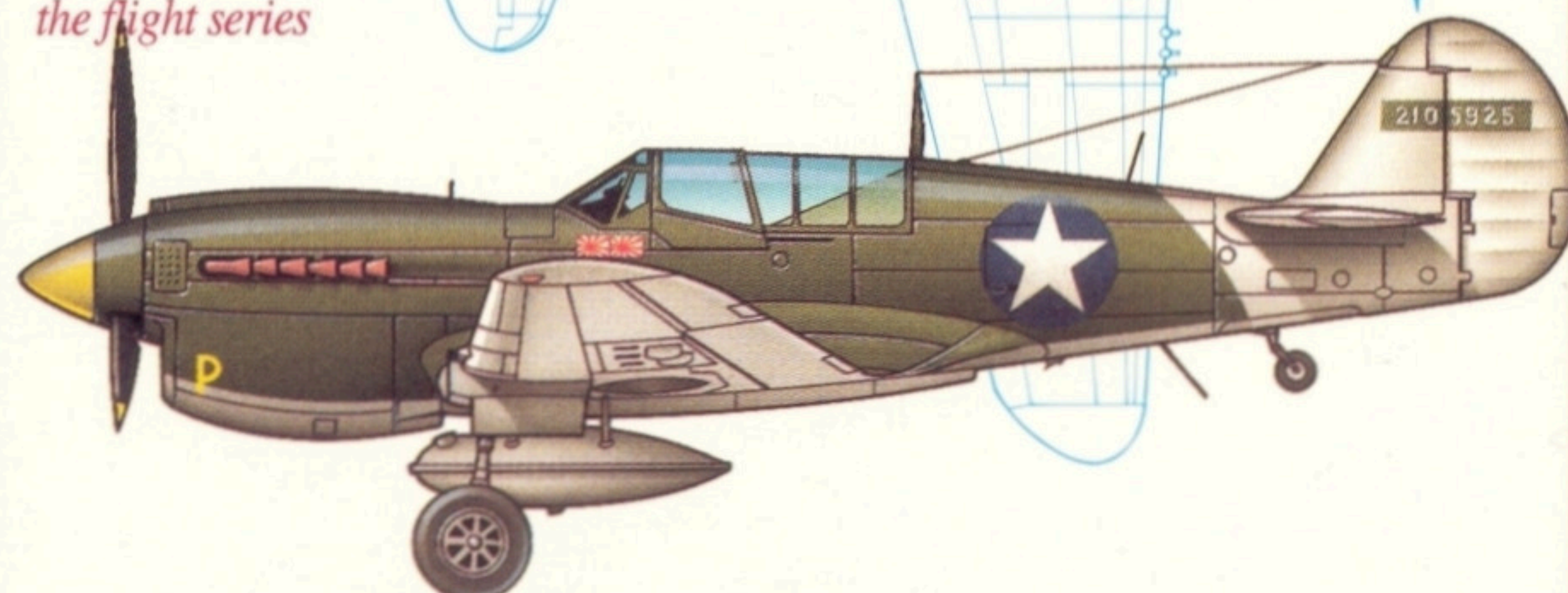
P-39Q AIRACOBRA

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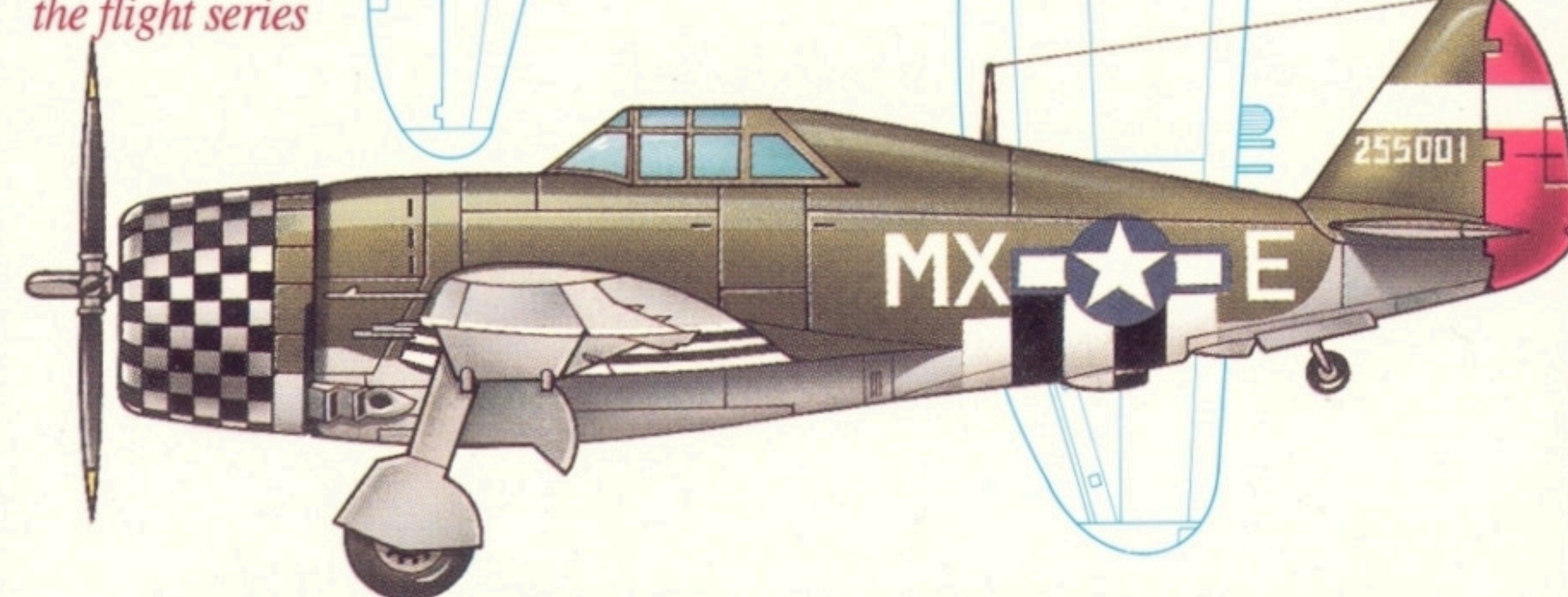
P-40E WARHAWK

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+
the flight series



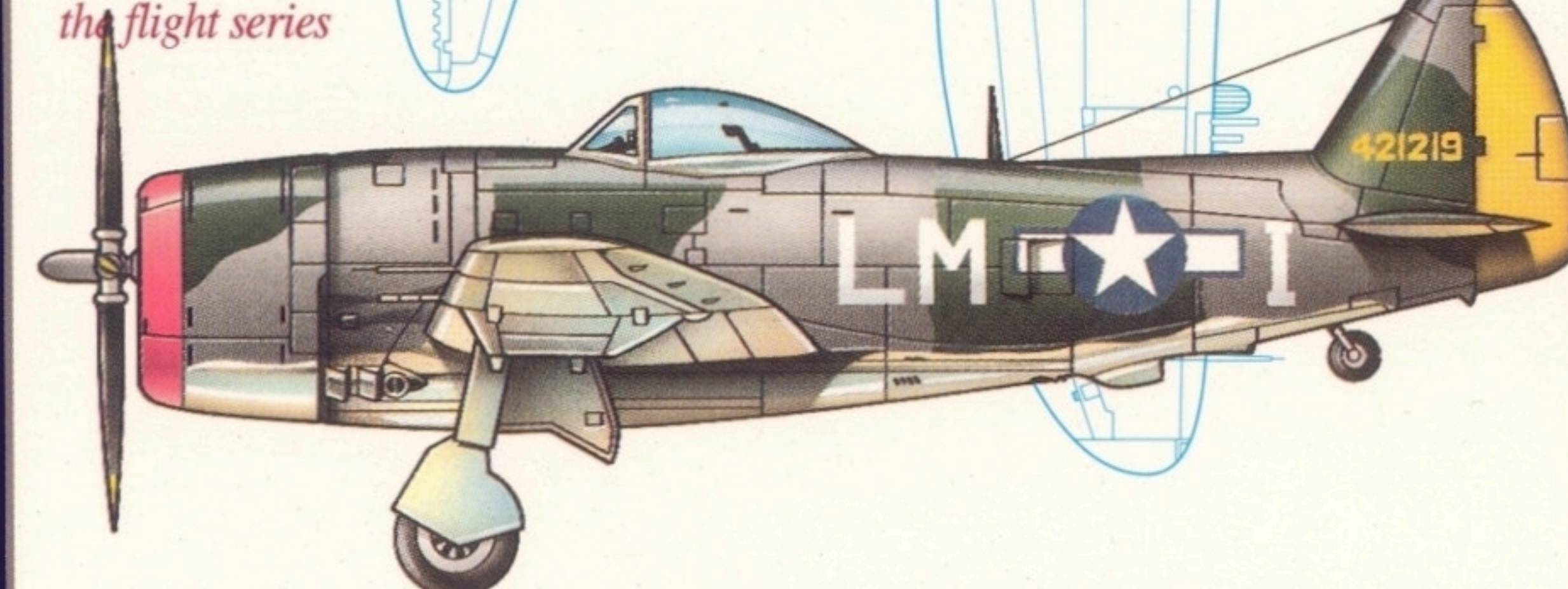
P-40N WARHAWK

WORLD WAR II
WAR
MACHINES
+
the flight series



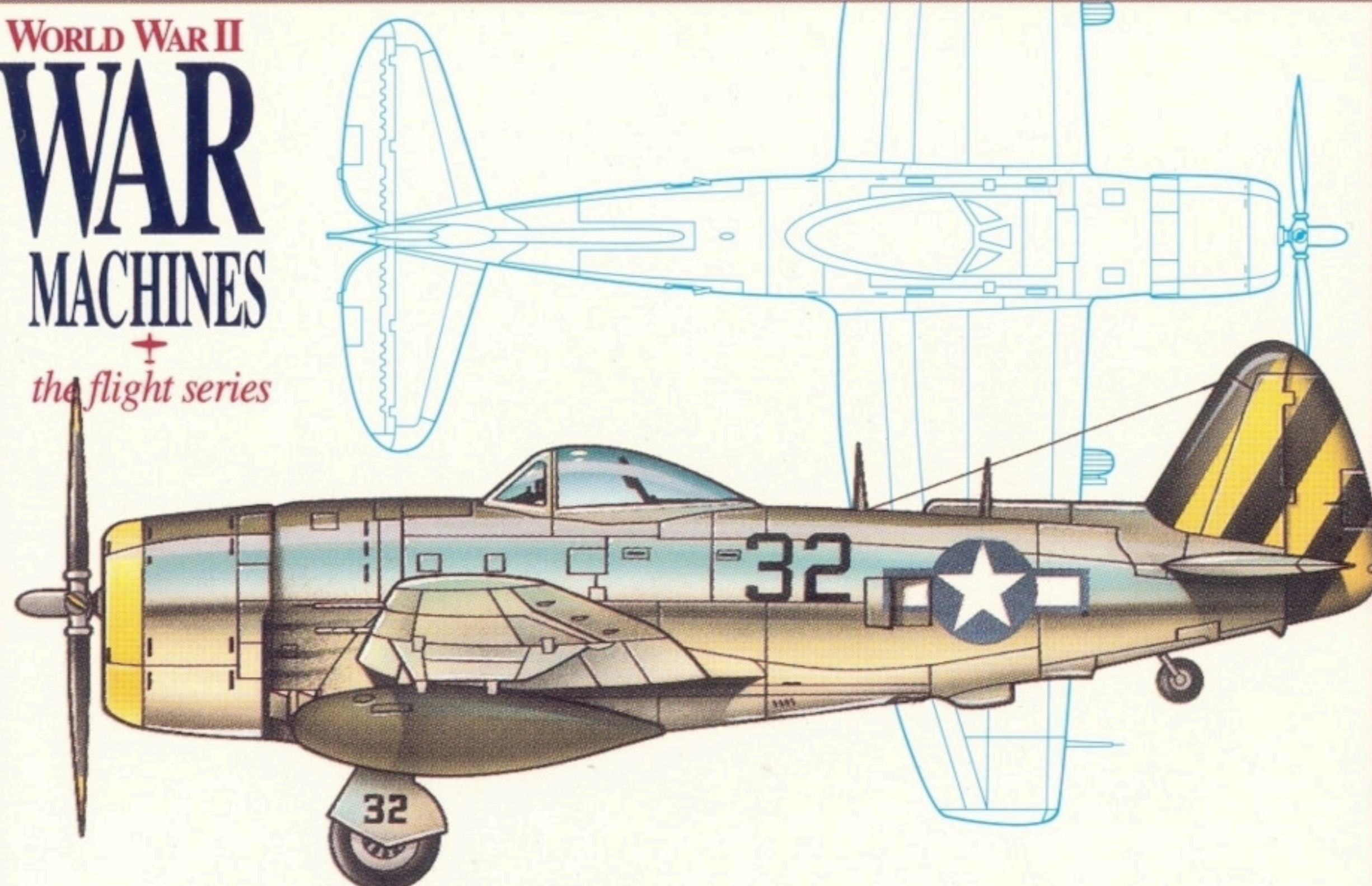
P-47D THUNDERBOLT

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WAR
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the flight series



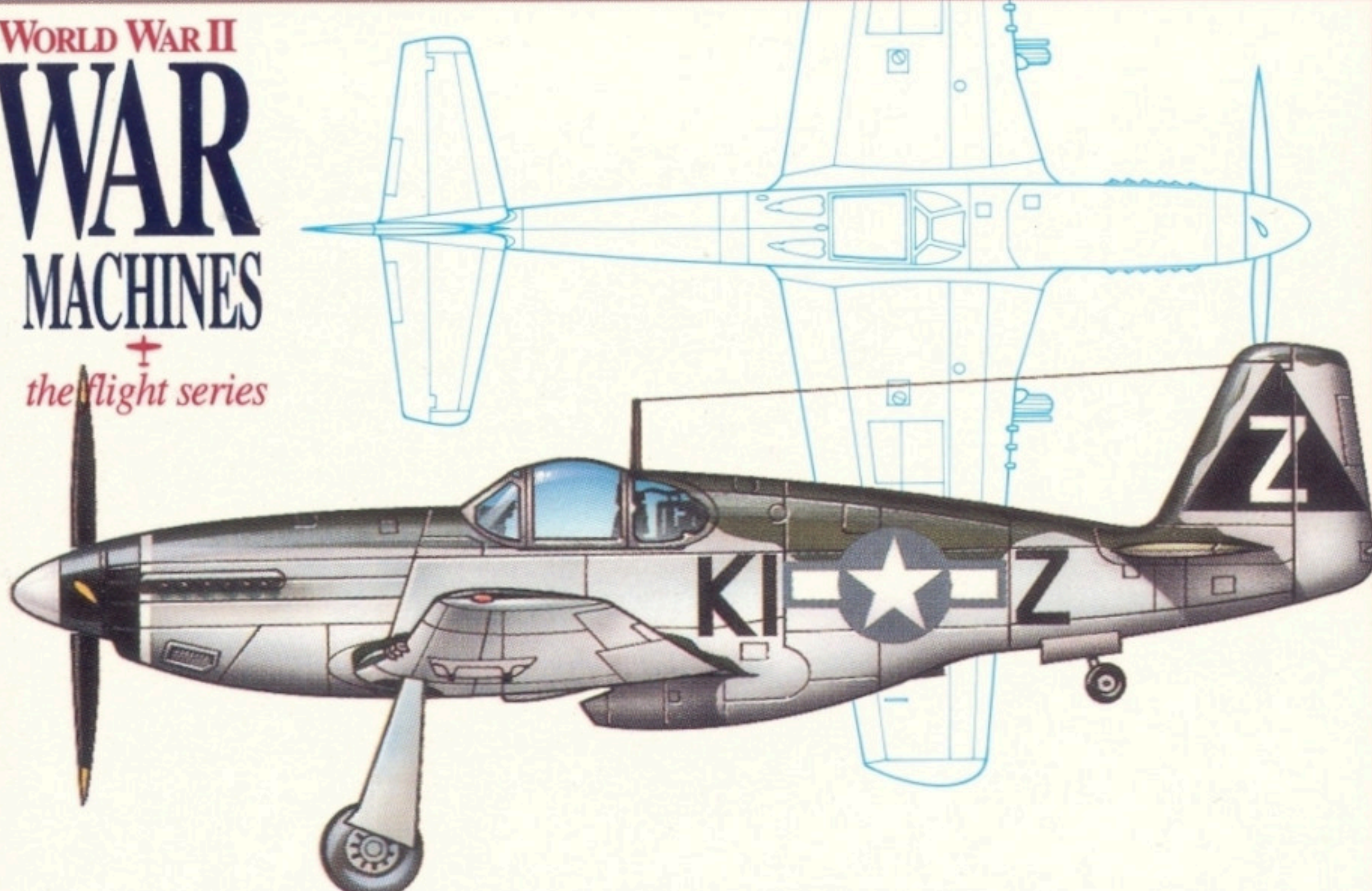
P-47D THUNDERBOLT

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WAR
MACHINES
+
the flight series



P-47N THUNDERBOLT

WORLD WAR II
WAR
MACHINES
+
the flight series



P-51B MUSTANG

WORLD WAR II
WAR
MACHINES
+
the flight series



P-51D MUSTANG

WORLD WAR II
**WAR
MACHINES**
+
the flight series

1

**Lockheed
P-38J
Lightning**

First Printing
RG
the richards group, inc.

The unique twin engine/twin-boom fuselage design of the P-38 proved versatile, enabling it to serve as long-range fighter escort, fighter bomber and reconnaissance aircraft. The Japanese regarded the Lightning as the best US high-altitude fighter. Other distinctions claimed by the P-38 include the first victory over a German aircraft (a Condor over the North Atlantic on 12/7/41) and the downing over the Solomons in 1943 of the aircraft carrying Admiral Yamamoto. The 2 top scoring US aces flew P-38s; Bong (40 kills) and McGuire (38 kills). This Lightning has the markings of the 433 Fighter Squadron, 475th Fighter Group, 5th Air Force, Dobodura New Guinea in early 1944.

Performance:
Maximum 414 m.p.h. at 25,000 ft.

Range:
2,260 miles maximum with external fuel tanks

Engines:
Two 1,425 h.p. 12 cylinder liquid-cooled Allison V-1710-91s

Armament:
Four .50 in. MGs, one 20 mm cannon, and 3200 lbs. of bombs

Dimensions:
Wing span 52 ft., Length 37 ft. 10 in., Height 9 ft. 10 in.

Ceiling:
35,000 ft.

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**WAR
MACHINES**
+
the flight series

2

**Bell
P-39Q
Airacobra**

First Printing
RG
the richards group, inc.

With tricycle landing gear and an engine situated behind the pilot, the P-39 was considered radical in 1939. Early in the war it saw much action, first in the Pacific and later in North Africa. Like most early war US fighters, it was inferior to the Japanese Zero, except in its ability to take considerable punishment and still fly. In North Africa it began operating as a ground support aircraft, and it was in this capacity that the Soviet airforce used the P-39 with great success. Half of the 9,558 P-39s produced found their way to the Soviets. This P-39Q carries the colors and markings of the 67th Fighter Sqd, 347th Fighter Group, 13th Air Force, Solomon Islands in 1943.

Performance:
Maximum 385 m.p.h. at 11,000 ft.

Range:
650 miles without drop tanks

Engine:
1200 h.p. 12 cylinder liquid-cooled Allison V-1710-85

Armament:
Four .50 in. MGs, 2 per wing, one 37 mm cannon, 500 lb. bomb load

Dimensions:
Wing span 34 ft., Length 30 ft. 2 in., Height 12 ft. 5 in.

Ceiling:
35,000 ft.

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**WAR
MACHINES**
+
the flight series

3

**Curtiss
P-40E
Warhawk**

First Printing
RG
the richards group, inc.

The P-40 design originated in the late 1930s and was not a match for contemporary European or Japanese fighters. Despite this, almost 14,000 P-40s of all types were produced and saw action on all war fronts with several different nations. Perhaps the best known use of early P-40s was with the American Volunteer Group in China. The Flying Tigers, as they became known, flew P-40Bs and Cs - the first US fighters to face the Zero. Their successes are a tribute to the pilots and the tactics they used. The AVG was absorbed by the 23rd Fighter Group in mid-1942 and this P-40E carries the 23rd's markings in late 1942, complete with Chinese insignia.

Performance:
Maximum 354 m.p.h. at 15,000 ft.

Range:
850 miles without drop tanks

Engine:
1,150 h.p. 12 cylinder liquid-cooled Allison V-1710-39

Armament:
Six .50 in. MGs, 3 per wing, and 500 lb. bomb load

Dimensions:
Wing span 37 ft. 4 in., Length 31 ft. 9 in., Height 12 ft. 4 in.

Ceiling:
29,000 ft.

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WORLD WAR II
**WAR
MACHINES**
+
the flight series

4

**Curtiss
P-40N
Warhawk**

First Printing
RG
the richards group, inc.

The P-40N turned out to be the most produced version of the Warhawk - 5,219 were built between 1943 and 1944. The "N" was an attempt to lighten the P-40 and simultaneously fit it with a more powerful Allison engine to increase overall performance. Even with these modifications, the P-40N was of limited value as a front line fighter and served primarily in the ground attack and tactical fighter-bomber role - a role it performed well. The P-40N on this card carries the colors and markings of the 35th Fighter Sqd., 8th Fighter Group, 5th Air Force in mid-1943 when this unit flew from bases in New Guinea.

Performance:
Maximum 378 m.p.h. at 10,500 ft.

Range:
240 miles without drop tanks

Engine:
1,360 h.p. 12 cylinder liquid-cooled Allison V-1710-81

Armament:
Four or six .50 in. MGs, 2/3 per wing, and 500 lb. bomb load

Dimensions:
Wing span 37 ft. 4 in., Length 33 ft. 4 in., Height 12 ft. 4 in.

Ceiling:
38,000 ft.

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WORLD WAR II
**WAR
MACHINES**
+
the flight series

5

**Republic
P-47D
Thunderbolt
(Razorback)**

First Printing
RG
the richards group, inc.

In early 1943 when it began equipping fighter groups in Europe, the P-47D was the largest and heaviest (7 tons) single-engined fighter in production. Even so, its turbo supercharged engine permitted it to out perform German Bf 109s and Fw 190s. It could out-dive anything. Drop tanks enabled it to protect bombers deep inside Germany. Combat losses (5,222) were low due to its ability to absorb great punishment. Some of these same attributes made it an excellent fighter-bomber. The 8th Air Force "razorback" shown carries the colors and markings of the 78th Fighter Group based at Duxford in the UK. It was just one of the 15,660 P-47s built.

Performance:
Maximum 428 m.p.h. at 30,000 ft.

Range:
800 miles on internal fuel, 1,700 with drop tanks

Engine:
2,300 h.p. 18 cylinder Pratt & Whitney R-2800-59 air-cooled radial

Armament:
Eight .50 in. MGs, 4 per wing and a 2300lb. external load

Dimensions:
Wing span 40 ft. 9 in., Length 36 ft. 1 in., Height 14 ft. 8 in.

Ceiling:
40,000 ft.

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WORLD WAR II
**WAR
MACHINES**
+
the flight series

6

**Republic
P-47D
Thunderbolt
(Bubbletop)**

First Printing
RG
the richards group, inc.

In mid-1943 a new version of the P-47D began appearing in the skies over Europe. It incorporated a "bubble top" canopy, providing excellent all-around vision, cut down rear fuselage and greater internal fuel, providing greater range. Later bubbletops were also fitted with a small dorsal fin leading to the tail to for added stability. The 56th Fighter Group, 8th Air Force flew P-47s until the end of the war refusing to switch to P-51s. The famed 56th produced many aces including Gabreski (31 kills) and Johnson (28 kills). The P-47D pictured on this card served with the 62nd Fighter Sqd., 56th Fighter Group, and was based in Boxted, England in early 1945.

Performance:
Maximum 428 m.p.h. at 30,000 ft.

Range:
1000 miles on internal fuel, 1,900 miles with drop tanks

Engine:
2,300 h.p. 18 cylinder Pratt & Whitney R-2800-59 air-cooled radial

Armament:
Eight .50 in. MGs, 4 per wing and a 2500 lb. bomb load

Dimensions:
Wing span 40 ft. 9 in., Length 36 ft. 1 in. Height 14 ft. 8 in.

Ceiling:
42,000 ft.

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WORLD WAR II
**WAR
MACHINES**
+
the flight series

7

**Republic
P-47N
Thunderbolt**

First Printing
RG
the richards group, inc.

In the Spring of 1945 combat units in the Pacific began receiving the P-47N. This version of the P-47 featured not only a more powerful engine, but an extended wing with clipped tips housing fuel cells capable of carrying an additional 200 gallons of gas. The additional fuel was needed for the ultra-long range bomber escort missions required in the Pacific theater. P-47Ns were capable of accompanying B-29s from bases in Saipan in the Marianas to targets in Japan. The aircraft on this card served with the 333rd Fighter Squadron, 318th Fighter Group based on Saipan - the first to receive the P-47N.

Performance:
Maximum 465 m.p.h. at 30,000 ft.

Range:
2,350 miles maximum range with drop tanks

Engine:
2,800 h.p. 18 cylinder Pratt & Whitney R-2800-57 air-cooled radial

Armament:
Eight .50 in. MGs, 4 per wing and 2,300 lb. bomb load

Dimensions:
Wing span 42 ft. 9 in., Length 36 ft. 1 in., Height 14 ft. 8 in.

Ceiling:
42,000 ft.

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WORLD WAR II
**WAR
MACHINES**
+
the flight series

8

**North
American
P-51B
Mustang**

First Printing
RG
the richards group, inc.

Originally designed to fit a 1940 British specification, the first Mustang was designed and built in a mere 117 days. The design was sound but initial results with Allison engines were disappointing. The P-51B emerged in 1942 when a Rolls Royce Merlin was substituted as the power plant. The combination produced a superb high altitude fighter capable of escort missions into the heart of Germany. The 8th Air Force began using the P-51B in December of 1943. The 8th Air Force P-51B on this card carries the markings of the 55th Fighter Squadron, 20th Fighter Group which flew from bases in the UK in July of 1944. In all, slightly over 3,700 P-51B models were produced.

Performance:
Maximum 440 m.p.h. at 30,000 ft.

Range:
810 miles combat range, 1,300 miles with drop tank

Engine:
1,400 h.p. 12 cylinder liquid-cooled Packard V-1650 (Rolls Royce Merlin)

Armament:
Four .50 in. MGs, two per wing

Dimensions:
Wing span 37 ft. Length 32 ft. 2 in., Height 12 ft. 2 in.

Ceiling:
42,000 ft.

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WORLD WAR II
**WAR
MACHINES**
+
the flight series

9

**North
American
P-51D
Mustang**

First Printing
RG
the richards group, inc.

Regarded as one of the finest fighters ever produced, P-51Ds began arriving in Europe in mid-1944 and in the Pacific in late 1944. The "D" model had a bubble canopy providing clear, all-around vision, and clean, almost elegant lines. Nearly 8,000 were built. In level flight P-51Ds could match Bf 109Gs, and in dives and climbs, could outperform them. These qualities enabled P-51 pilots to down nearly 5,000 aircraft in air-to-air combat. Preddy (28 kills) and Gentile (22 kills) were top scoring 8th Air Force P-51 pilots. This P-51D displays the markings of the 334th Fighter Sqd., of the famous, high scoring 4th Fighter Group, 8th Air Force in mid 1944.

Performance:
Maximum 437 m.p.h. at 25,000 ft.

Range:
950 miles, with drop tanks maximum of 2,000 miles

Engine:
1,590 h.p. 12 cylinder liquid-cooled Packard V-1650

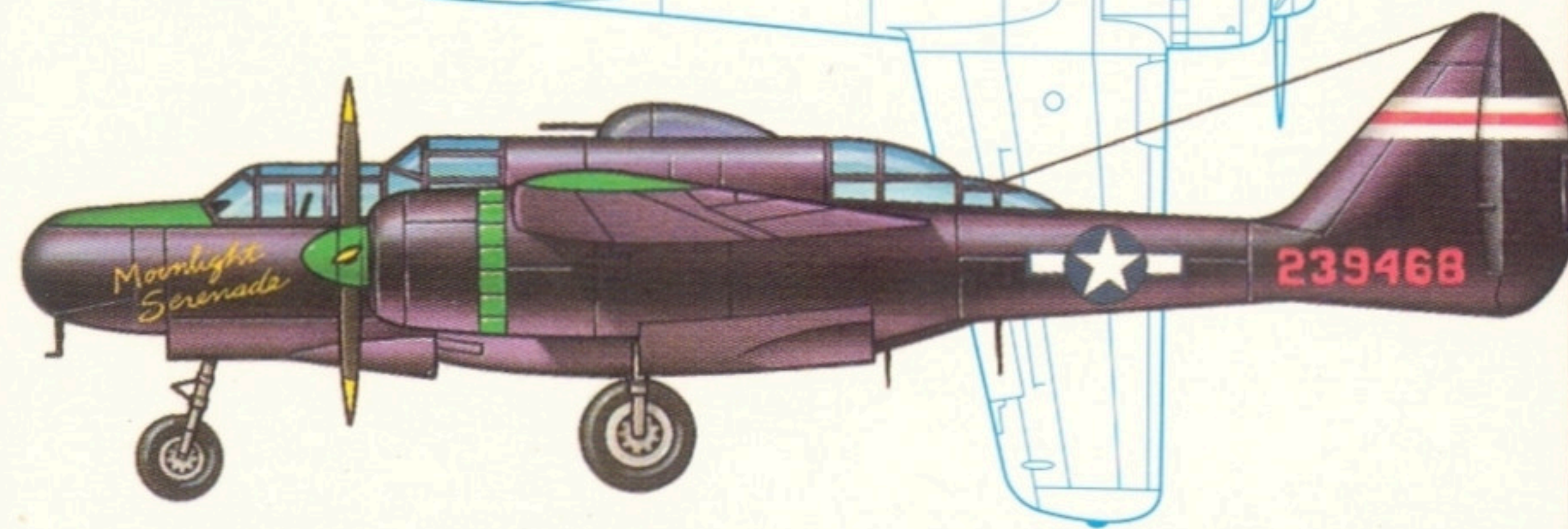
Armament:
Six .50 in. MGs, 3 per wing

Dimensions:
Wing span 37 ft., Length 32 ft. 3 in. Height 13 ft. 8 in.

Ceiling:
41,900 ft.

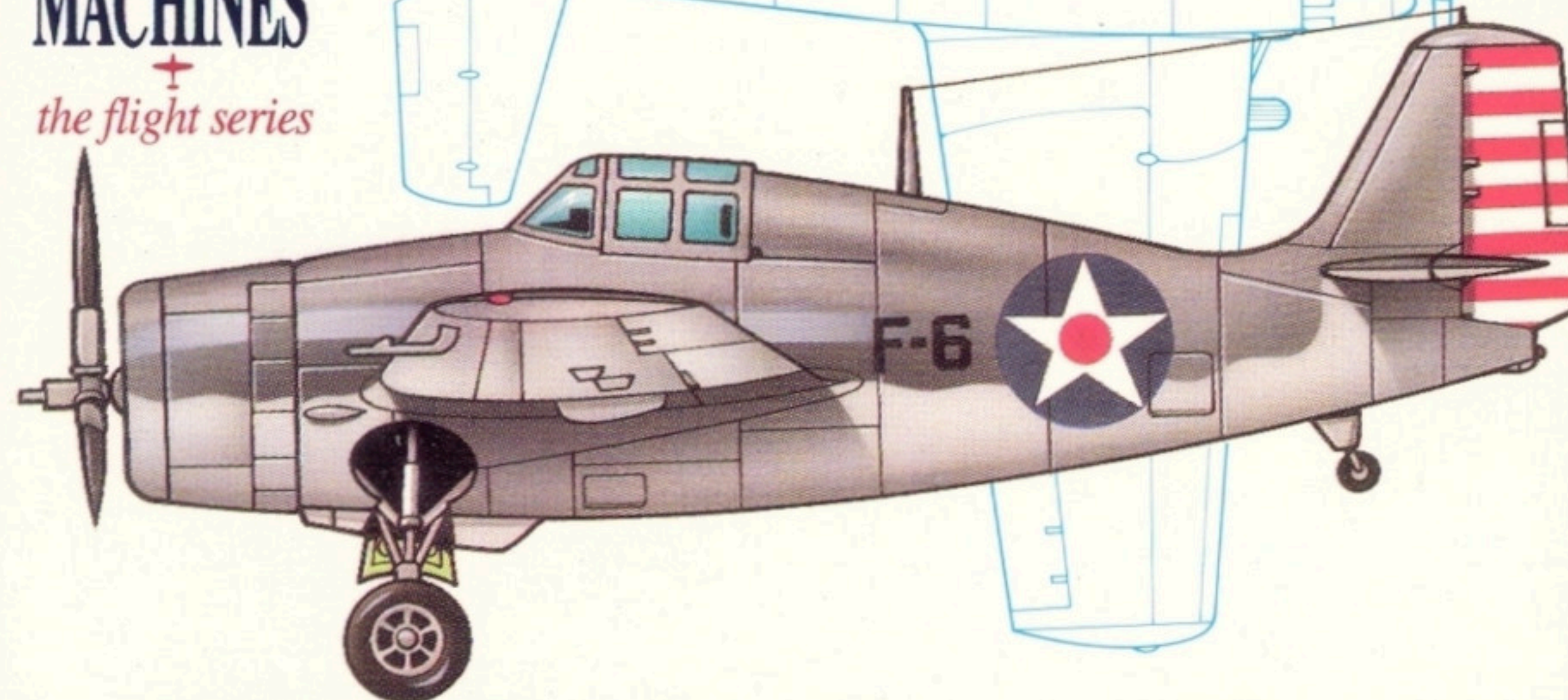
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WAR
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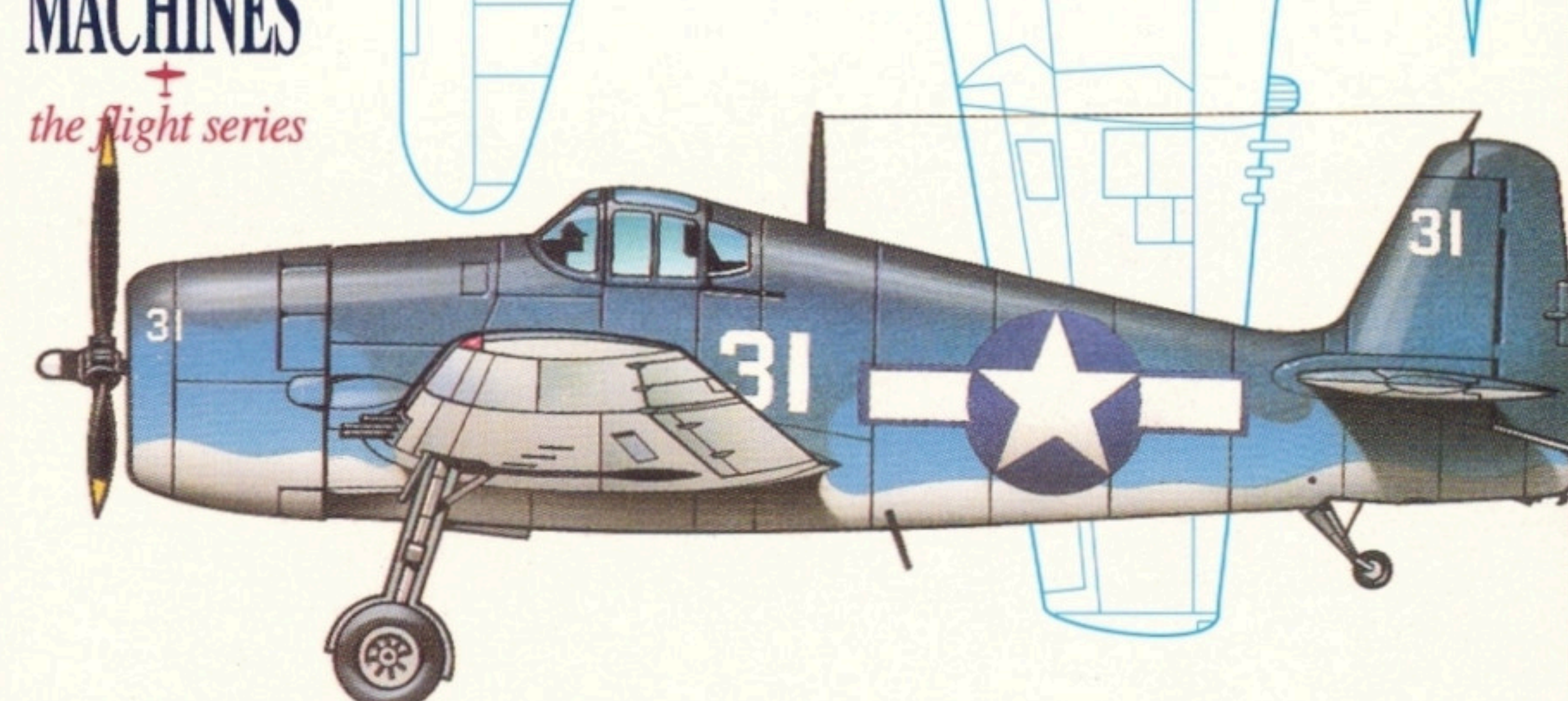
P-61B BLACK WIDOW

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WAR
MACHINES
+
the flight series



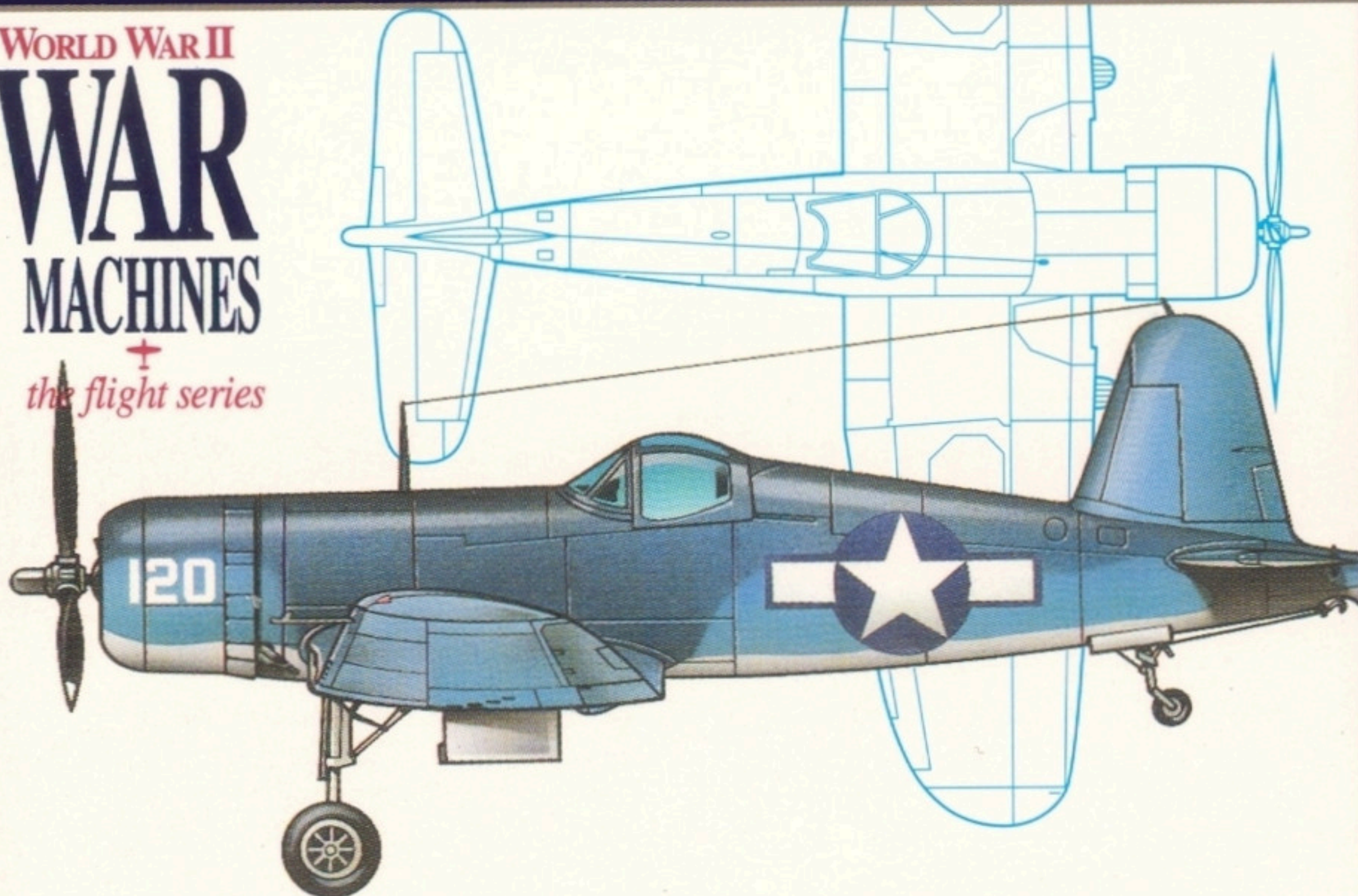
F4F-3 WILDCAT

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WAR
MACHINES
+
the flight series



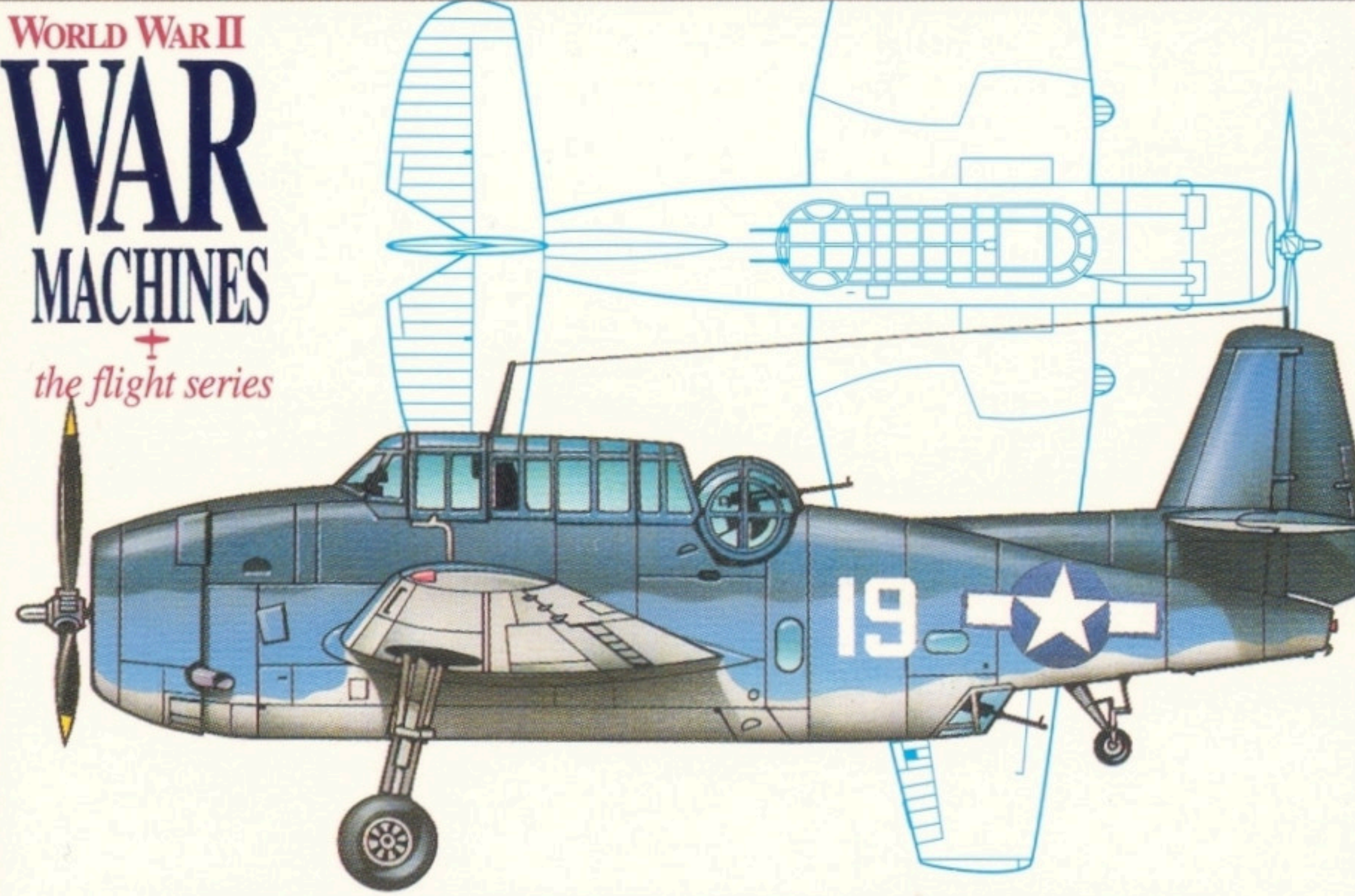
F6F-3 HELLCAT

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WAR
MACHINES
+
the flight series



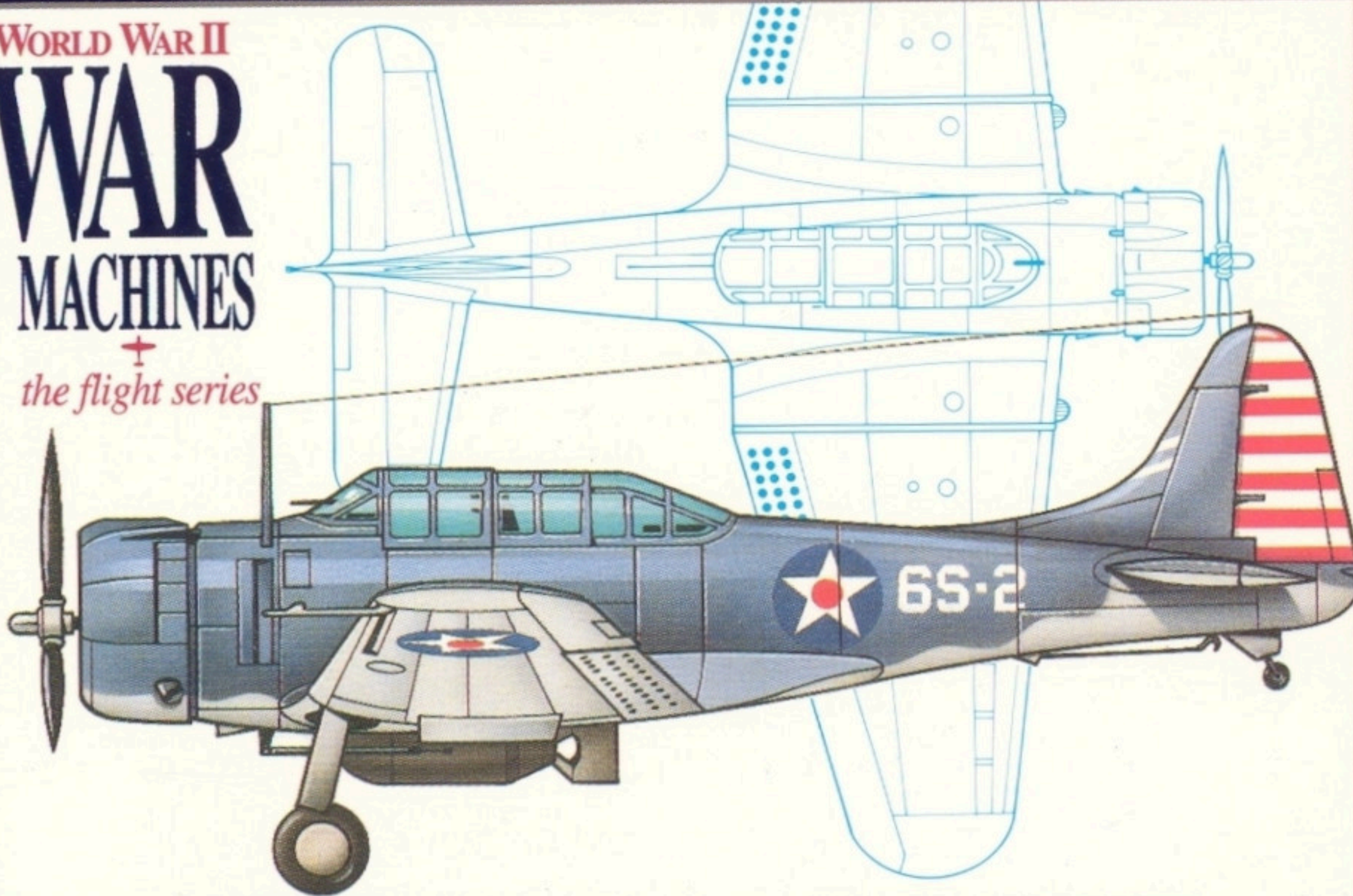
F4U-1A CORSAIR

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WAR
MACHINES
+
the flight series



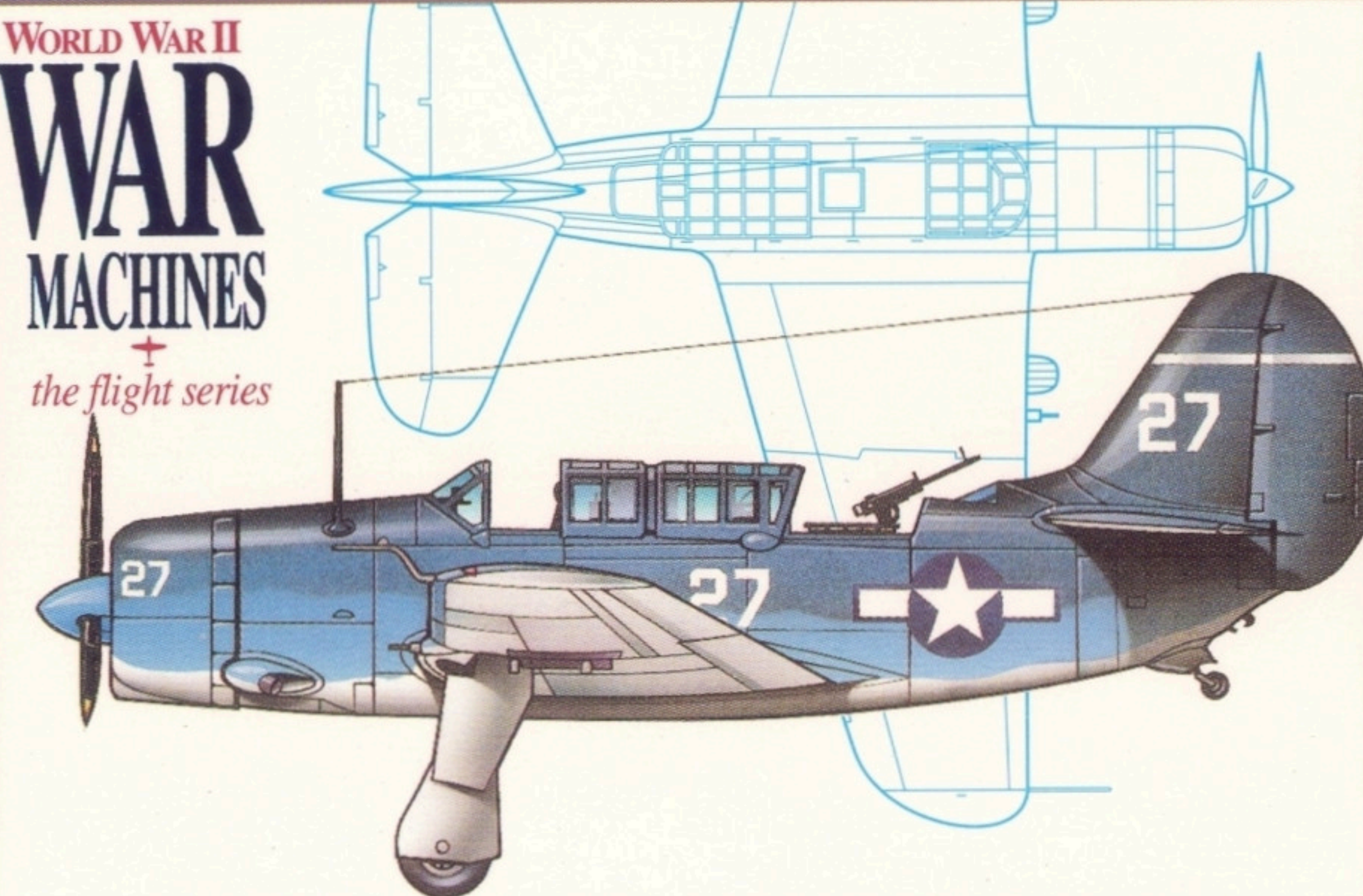
TBF AVENGER

WORLD WAR II
WAR
MACHINES
+
the flight series



SBD-3 DAUNTLESS

WORLD WAR II
WAR
MACHINES
+
the flight series



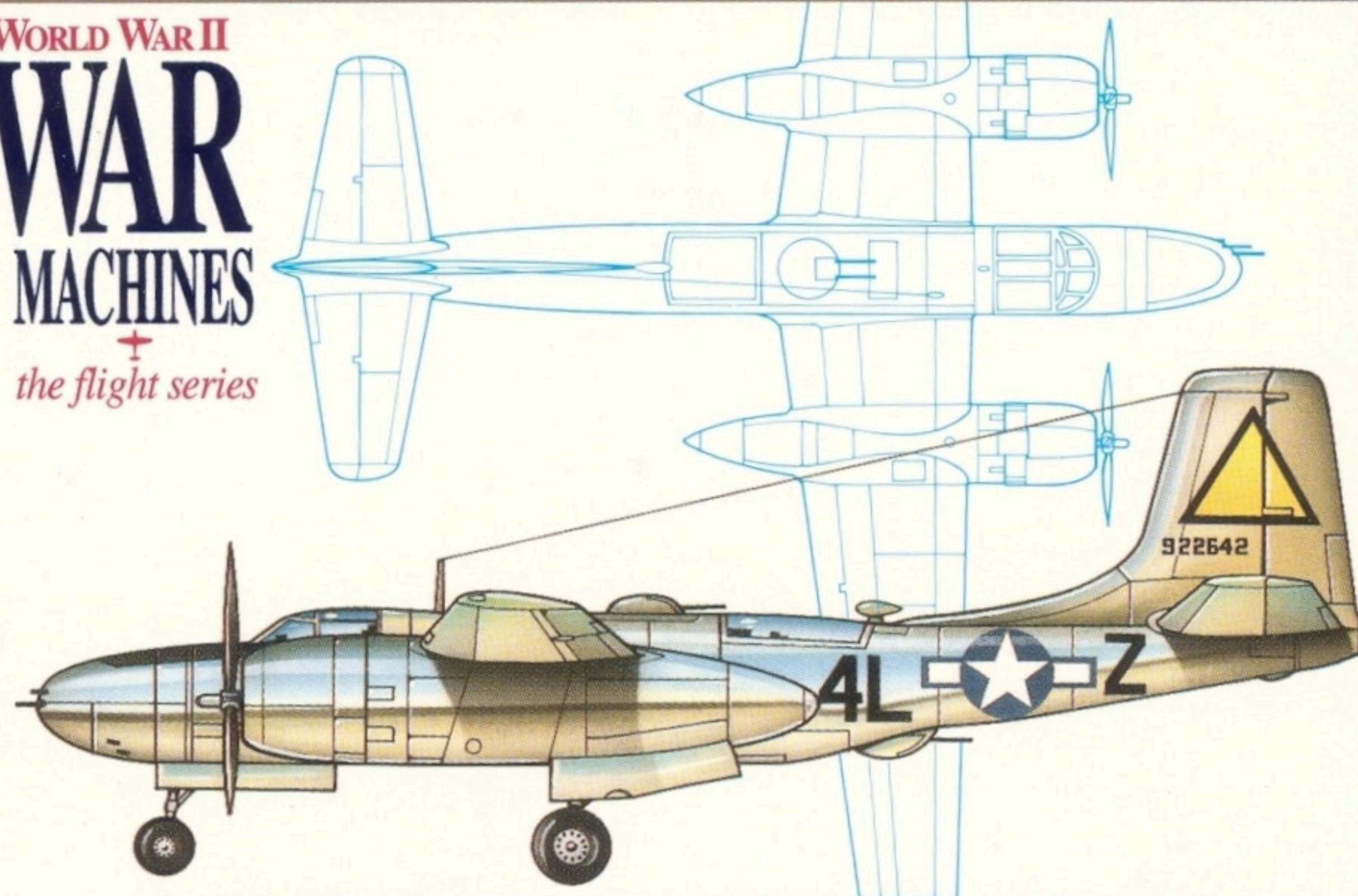
SB2C-1 HELLDIVER

WORLD WAR II
WAR
MACHINES
+
the flight series



A-20J HAVOC

WORLD WAR II
WAR
MACHINES
+
the flight series



A-26B INVADER

WORLD WAR II
**WAR
MACHINES**
+
the flight series

10

**Northrop
P-61B
Black
Widow**

First Printing
RG
the richards group, inc.

Large, but extremely maneuverable and packing a punch as deadly as its menacing looks, the P-61 was aptly named the Black Widow. It was the only WWII US aircraft designed specifically as a night fighter. Painted black and flown at night, the P-61 used air-borne radar to locate enemy aircraft. The formidable P-61 did not see service until the middle of 1944 due to problems with the radar unit. 450 P-61Bs were built and they served in both the Pacific theater and in Europe. The P-61B on this card served with the 550th Night Fighter Sqd. in the Pacific during 1945 and is currently on display at the Air Force Museum in Dayton OH.

Performance:

Maximum 366 m.p.h. at 20,000 ft.

Range:

1,050 miles

Engines:

Two 2,000 h.p. 18 cylinder

Pratt & Whitney

R-2800-65 air-cooled radials

Armament:

Four 20 mm cannon in fuselage ,

four .50 in. MGs in dorsal turret,

6,400 lb. bomb load

Dimensions:

Wing span 66 ft., Length

49 ft. 7 in., Height 14 ft. 8 in.

Ceiling:

33,000 ft.

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WORLD WAR II
**WAR
MACHINES**
+
the flight series

11

**Grumman
F4F-3
Wildcat**

First Printing
RG
the richards group, inc.

The F4F-3, shown here in the early war colors of the USS Lexington, was the US Navy's most modern carrier fighter at the start of the Pacific war. The first Grumman "cat" was at a disadvantage against the Japanese Zero. It lacked the Zero's climb rate, range and agility but did offer good pilot protection and could take considerable punishment and stay in the air. Trying to turn with a Zero was usually fatal and Wildcat pilots soon learned to work in pairs, stay at altitude, maintain high speeds and dive when attacked. Wildcats "held on" until 1943 when more effective carrier fighters became available. In all, 7,825 Wildcats of all types were produced.

Performance:

Maximum 330 m.p.h. at 21,300 ft.

Range:

845 miles

Engine:

1,200 h.p. 14 cylinder

Pratt & Whitney

R-1830-76 air-cooled radial

Armament:

Four .50 in. MGs, 2 per wing

Dimensions:

Wing span 38 ft.,

Length 28 ft. 9 in.,

Height 11 ft. 10 in.

Ceiling:

37,500 ft.

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WORLD WAR II
**WAR
MACHINES**
+
the flight series

12

**Grumman
F6F-3
Hellcat**

First Printing
RG
the richards group, inc.

Starting in 1942, over 12,000 Hellcats were produced in just over two years! Perhaps more impressive is the Hellcat's record against Japanese aircraft. It is credited with the best "kill" ratio of any WWII fighter - 19 enemy aircraft for each Hellcat lost. F6F-3s like this one began to equip the Navy's new fast carriers in 1943. The F6F quickly became the principal US carrier fighter, accounting for a total of 5,156 enemy aircraft by war's end. All of the US Navy's top scoring aces, including McCampbell (34 kills) and Valencia (23 kills) piloted Hellcats. Not quite as agile as the Zero, Hellcats had superior armor, speed and rate of climb.

Performance:

Maximum 376 m.p.h. at 17,300 ft.

Range:

1,090 miles without drop tanks

Engine:

2,000 h.p. 18 cylinder

Pratt & Whitney

R-2800-10 air-cooled radial

Armament:

Six .50 in. MGs, 3 per wing

Dimensions:

Wing span 42 ft. 10 in.,

Length 33 ft. 7 in.,

Height 13 ft. 1 in.

Ceiling:

38,400 ft.

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WORLD WAR II
**WAR
MACHINES**
+
the flight series

13

**Chance-
Vought
F4U-1A
Corsair**

First Printing
RG
the richards group, inc.

In 1940 the Corsair became the first US fighter to exceed 400 m.p.h. in level flight and went on to become what many regard as the best US fighter of WWII. Because the big gull-winged fighter was initially thought unfit for carrier operations, the Corsair first saw combat with Marine units fighting in the Solomon Is. In early 1943, it equipped all eight Marine fighter squadrons in the Pacific. Over the next two years, the Corsair established a kill ratio of 11:1 and was considered by most Japanese pilots to be the best US fighter at any altitude. Top scoring Marine aces flying the F4U were Boyington (28 kills) and Foss (26 kills). F4Us like that pictured, flew with VMF-111 and other Marine units.

Performance:

Maximum 417 m.p.h. at 20,000 ft.

Range:

1,015 miles without drop tanks

Engine:

2,000 h.p. 18 cylinder Pratt &

Whitney R-2800-8 air-cooled

radial

Armament:

Six .50 in. MGs, 3 per wing

Dimensions:

Wing span 41 ft.,

Length 33 ft. 4 in.,

Height 15 ft. 1 in.

Ceiling:

36,900 ft.

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WORLD WAR II
**WAR
MACHINES**
+
the flight series

14

**Grumman
TBF
Avenger**

First Printing
RG
the richards group, inc.

The Avenger torpedo bomber first flew in 1941 and made an unsuccessful combat debut in 1942 at the battle of Midway. There, 5 of 6 unescorted TBFs were lost. When working as part of carrier air groups, TBFs fared much better. They participated in every major carrier engagement in the Pacific and by war's end, TBFs had contributed to the demise of Japan's two super battleships (*Musashi* and *Yamato*), 5 carriers and a significant percentage of Japanese merchant shipping. 9,839 Avengers were built, each carried a crew of 3 and it was the largest carrier aircraft used by the Navy. The TBF on this card flew from the USS Essex in 1943/44.

Performance:

Maximum 271 m.p.h. at 12,000 ft.

Range:

1,215 miles

Engine:

1,700 h.p. 14 cylinder

Wright R-2600-8

air-cooled radial

Armament:

Two .30 in. MGs (cowling/fuse-

lage belly), one .50 in. MG (tur-

ret), one 22 in. 1,921 lb. torpedo

Dimensions:

Wing span 54 ft. 2 in., Length

40 ft., Height 16 ft. 5 in.

Ceiling:

22,400 ft.

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WORLD WAR II
**WAR
MACHINES**
+
the flight series

15

**Douglas
SBD-3
Dauntless**

First Printing
RG
the richards group, inc.

Arguably the aircraft that turned the tide in the Pacific, Dauntless dive bombers like this USS Enterprise based SBD-3 from VS-6, were the US Navy's principal air weapon during the first 11 months of the Pacific war. Not fast, but an exceptionally stable dive bombing platform, the SBD could take stress loads of up to 9 Gs. These attributes were put to the test during the key battles of the Coral Sea, Midway, and the epic struggles in the eastern Solomon Islands. Dauntlesses destroyed Japanese naval air supremacy at Midway, sinking four fleet aircraft carriers. A total of 5,936 were produced, the last in 1944.

Performance:

Maximum 250 m.p.h. at 16,000 ft.

Range:

1,345 miles

Engine:

1,000 h.p. 9 cylinder

Wright R-1820-52

air-cooled radial

Armament:

One 500 lb. or 1,000 lb. bomb,

two .50 in. wing guns and two 30

MGs for rear defense

Dimensions:

Wing span 41 ft. 6 in., Length

32 ft. 6 in., Height 13 ft. 7 in.

Ceiling:

27,100 ft.

© 1993

WORLD WAR II
**WAR
MACHINES**
+
the flight series

16

**Curtiss
SB2C-1
Helldiver**

First Printing
RG
the richards group, inc.

In November of 1943, a new dive bomber began to replace the venerable Dauntless on US carriers - the Helldiver. Not a particularly attractive aircraft and not as popular with their crews as the Dauntlesses had been, Helldivers nevertheless proved to be a potent weapon. Hundreds of Helldivers served with Task Force 58 as it cut across the Central Pacific. Along with US submarines and the Avenger torpedo bomber, Helldivers were responsible for the final destruction of Japan's carriers and other surface ships in 1944/45. Over 7,200 Helldivers were built and they served with the US fleet until into the 1950s. The SB2C-1 pictured here served on a TF 58 carrier - the USS Essex.

Performance:

Maximum 281 m.p.h. at 12,400 ft.

Range:

1,110 miles

Engine:

1,700 h.p. 14 cylinder

Wright R-2600-8

air-cooled radial

Armament:

Two 20 mm cannon in wings, two

.30 in. MG (rear gunner), and a

1,000 lb. bomb load

Dimensions:

Wing span 49 ft. 9 in., Length

36 ft. 8 in., Height 13 ft. 2 in.

Ceiling:

24,700 ft.

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WORLD WAR II
**WAR
MACHINES**
+
the flight series

17

**Douglas
A-20J
Havoc**

First Printing
RG
the richards group, inc.

First used by the French and the British, and later in substantial numbers by the Soviets, the Havoc was an extremely versatile light bomber and attack aircraft. For a time it was even used by the USAAF as a night fighter (designated P-70) in the Pacific before being replaced by the Black Widow. Although most versions of the A-20 appeared with a glazed nose, the A-20G had a solid nose housing six guns. The "J" reintroduced the glazed nose and was used primarily for tactical bombing. A total of 7,385 A-20s were built. The A-20J pictured here flew with the 668th Bomb Group, 416th Bomb Squadron in the skies over Europe in June of 1944.

Performance:

Maximum 317 m.p.h. at 10,700 ft.

Range:

1,000 miles

Engines:

Two 1,600 h.p. 14 cylinder

Wright R-2600-23

air-cooled radials

Armament:

Six .50 in. MGs and a 4,000 lb.

bomb load

Dimensions:

Wing span 61 ft. 4 in.,

Length 48 ft. 4 in.,

Height 17 ft. 7 in.

Ceiling:

23,100 ft.

© 1993

WORLD WAR II
**WAR
MACHINES**
+
the flight series

18

**Douglas
A-26B
Invader**

First Printing
RG
the richards group, inc.

The A-26 was designed as a replacement for the A-20 ground attack/tactical bomber and it entered service in the latter half of 1944. The "B" model, which was the most numerous model to see action in WWII, was heavily armed and very fast. Typically, Invaders carried 6 to 8 guns in the nose and the dorsal turret's 2 additional guns could be trained forward. Most of its combat sorties were carried out over Europe. A-26s were so effective that they went on to see service as bombers in Korea and as counter insurgency aircraft in Viet Nam. The Invader on this card carries the colors and markings of the 391st Bomb Group, 9th Air Force in April 1945.

Performance:

Maximum 355 m.p.h. at 15,000 ft.

Range:

1,400 miles

Engines:

Two 2,000 h.p. 18 cylinder

Pratt & Whitney R-2800-27

air-cooled radials

Armament:

Ten .50 in. MGs and a

4000 lb. bomb load

Dimensions:

Wing span 70 ft.

Length 50 ft.,

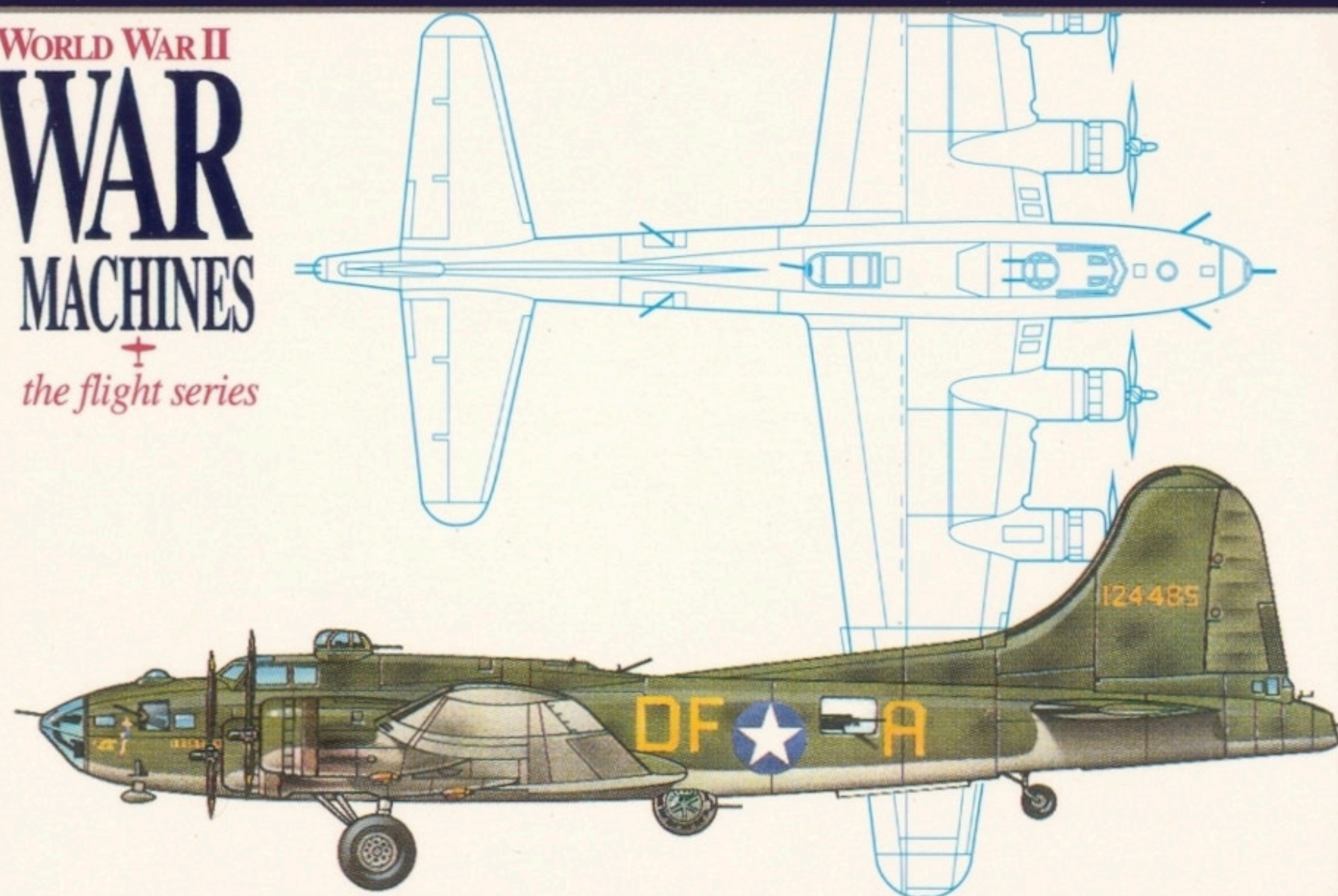
Height 18 ft. 6 in.

Ceiling:

22,100 ft.

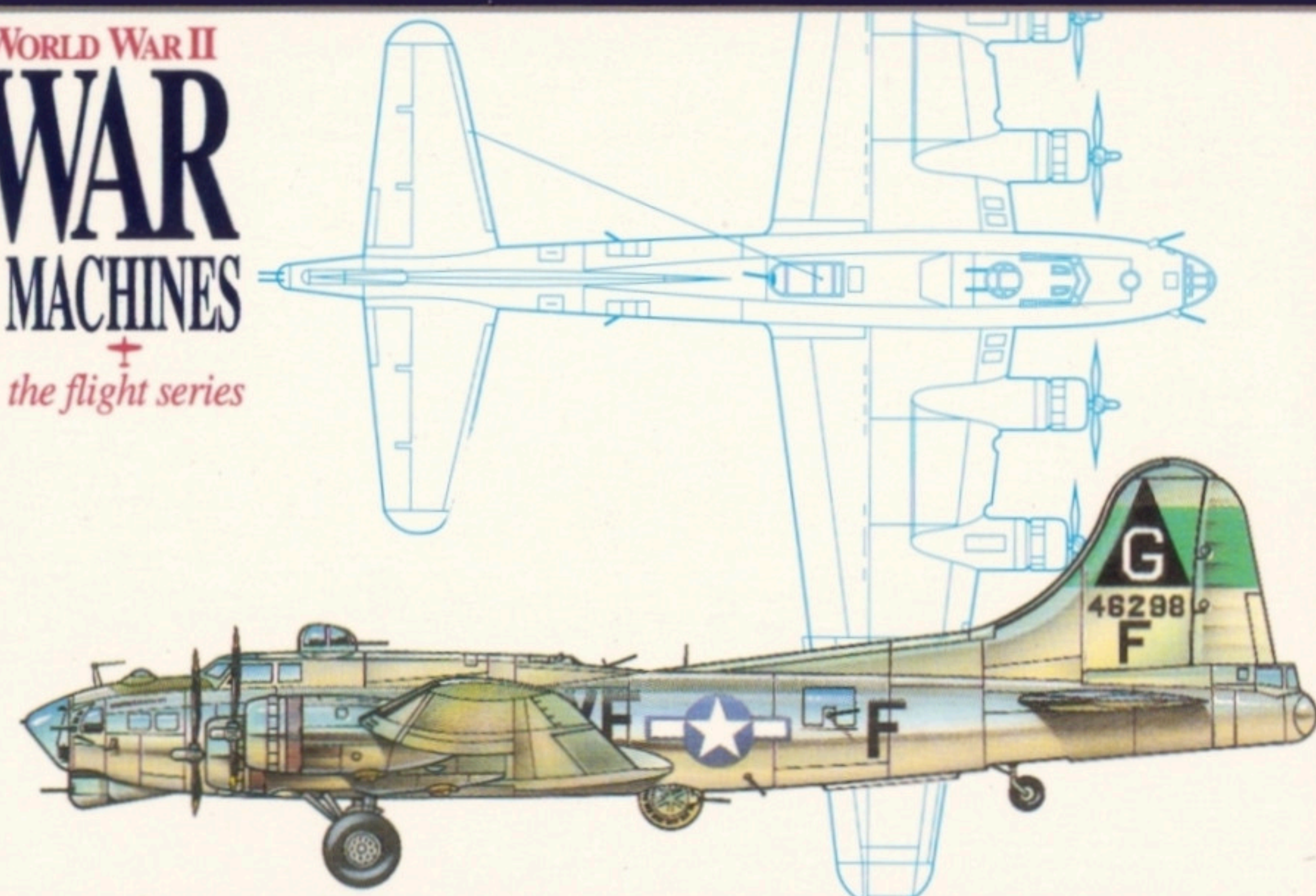
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WORLD WAR II
WAR
MACHINES
+
the flight series



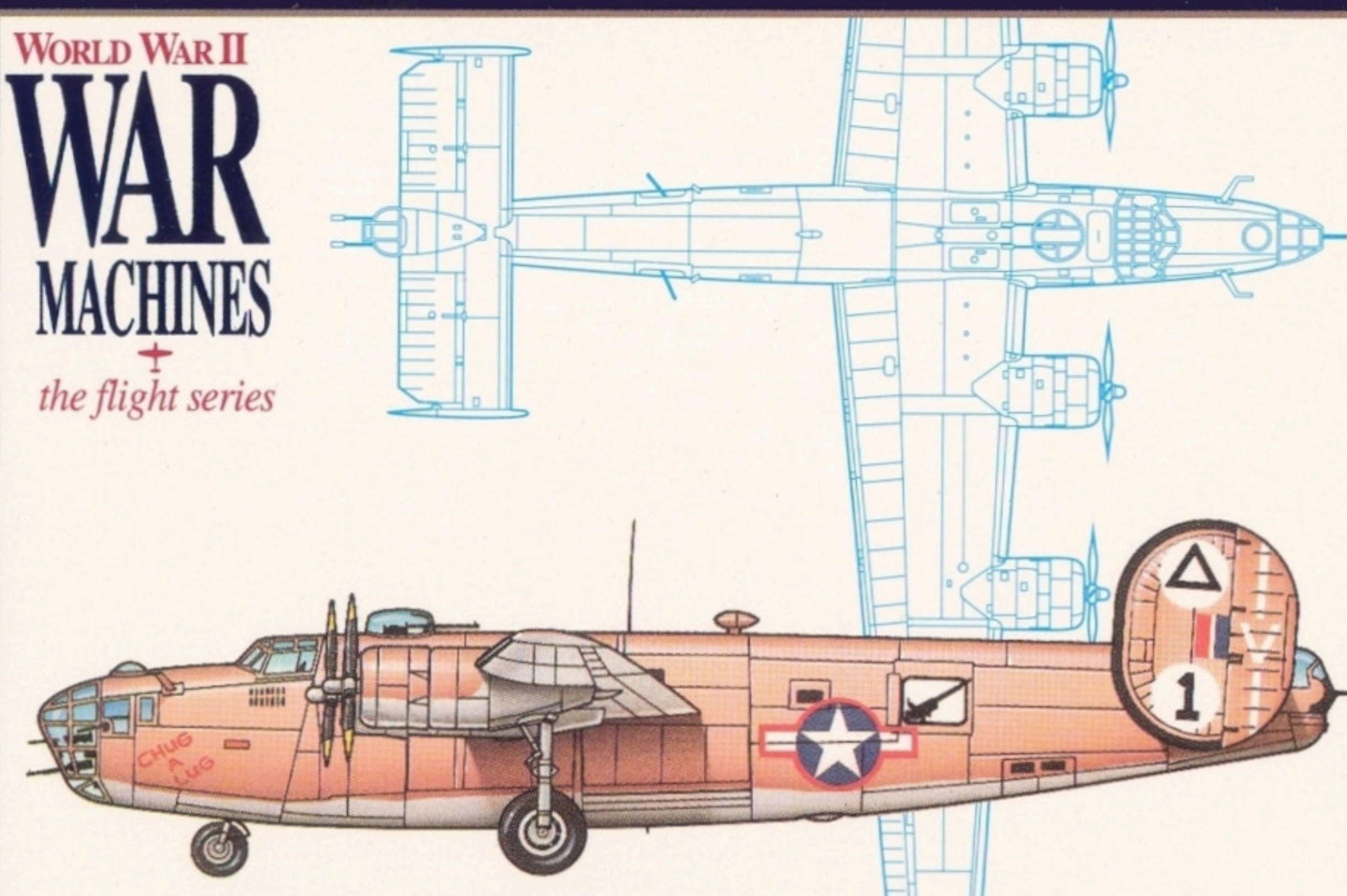
B-17F FLYING FORTRESS

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WAR
MACHINES
+
the flight series



B-17G FLYING FORTRESS

WORLD WAR II
WAR
MACHINES
+
the flight series



B-24D LIBERATOR

WORLD WAR II
WAR
MACHINES
+
the flight series



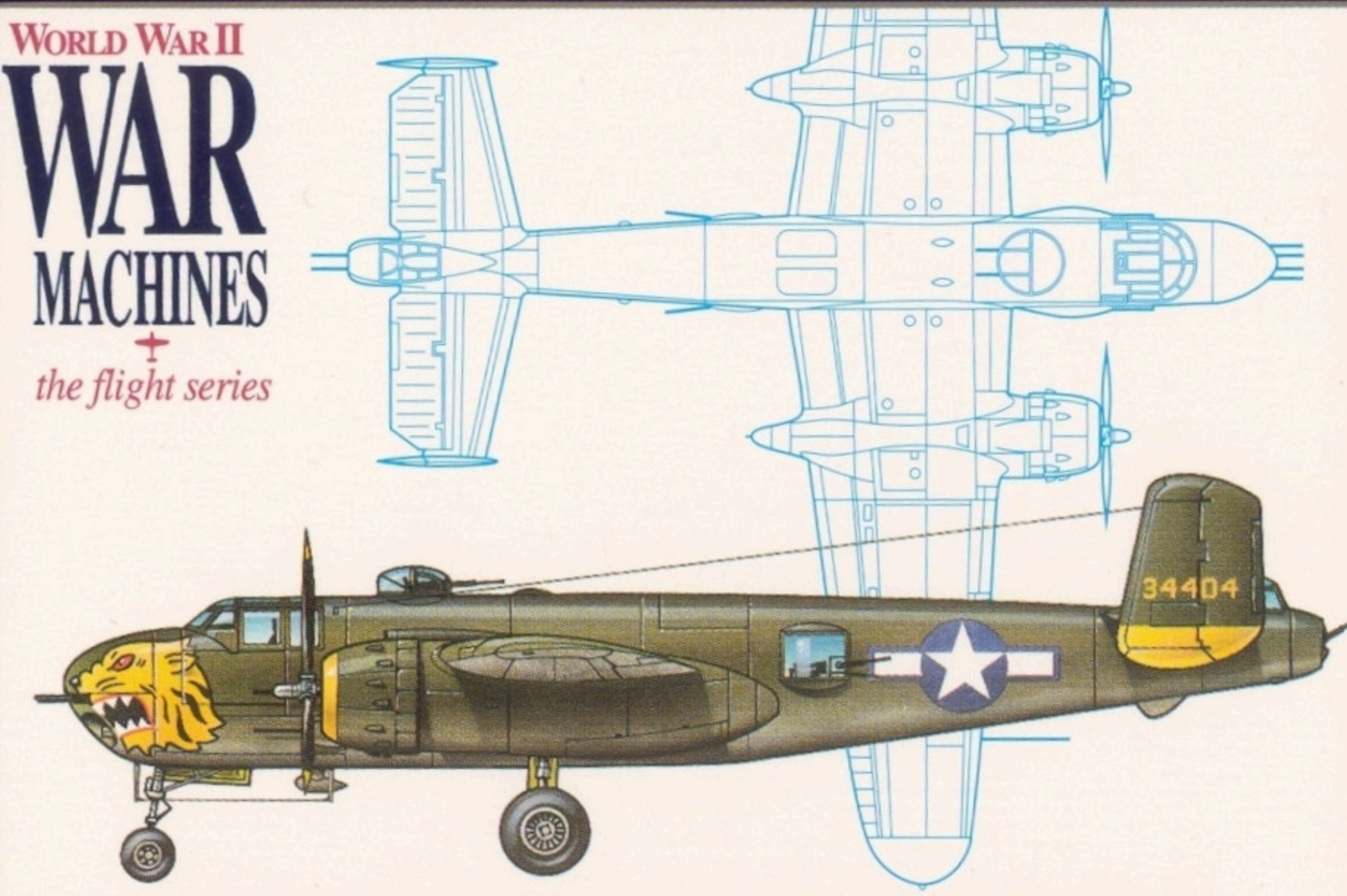
B-24J LIBERATOR

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WAR
MACHINES
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the flight series



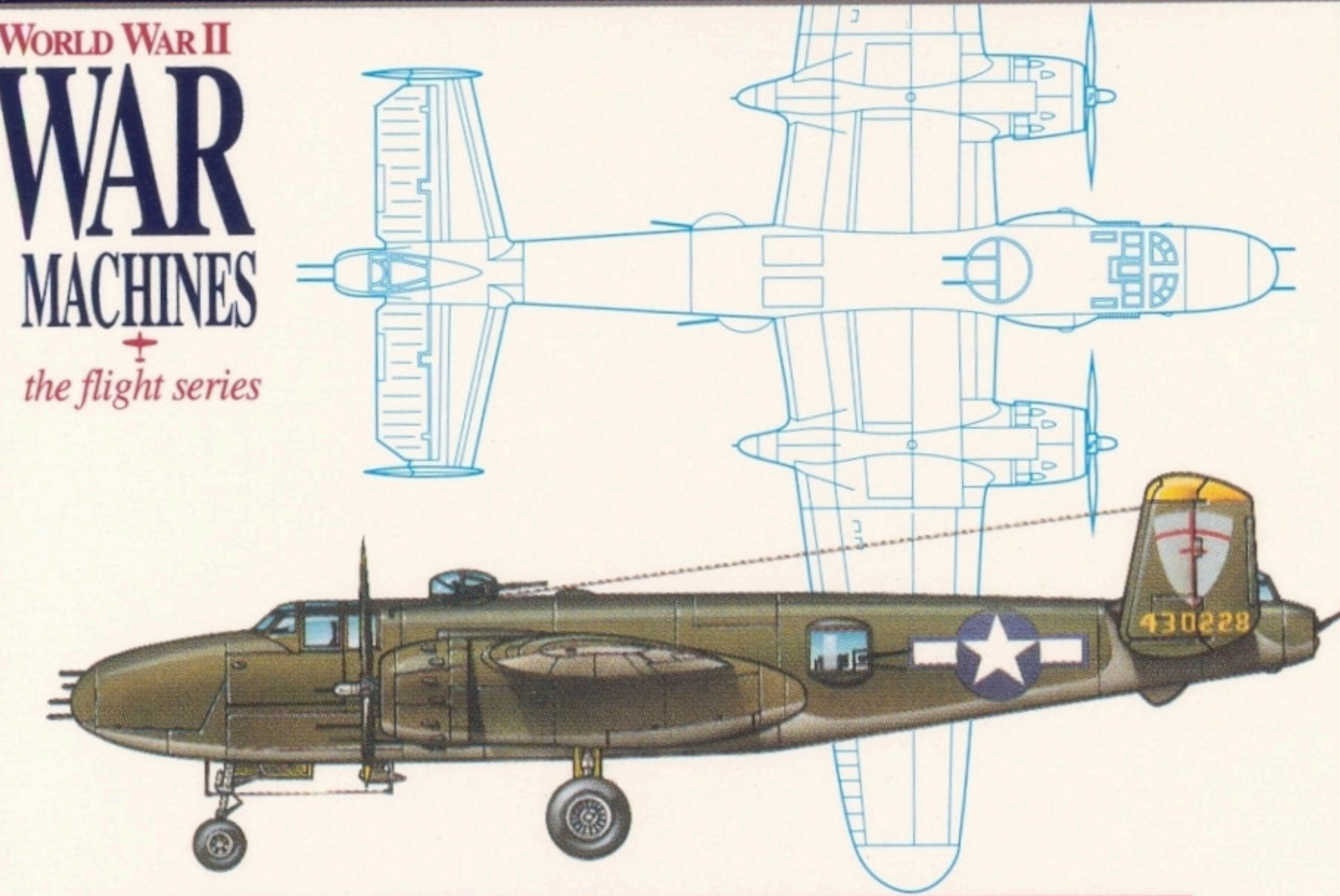
B-25C/D MITCHELL

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WAR
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+
the flight series



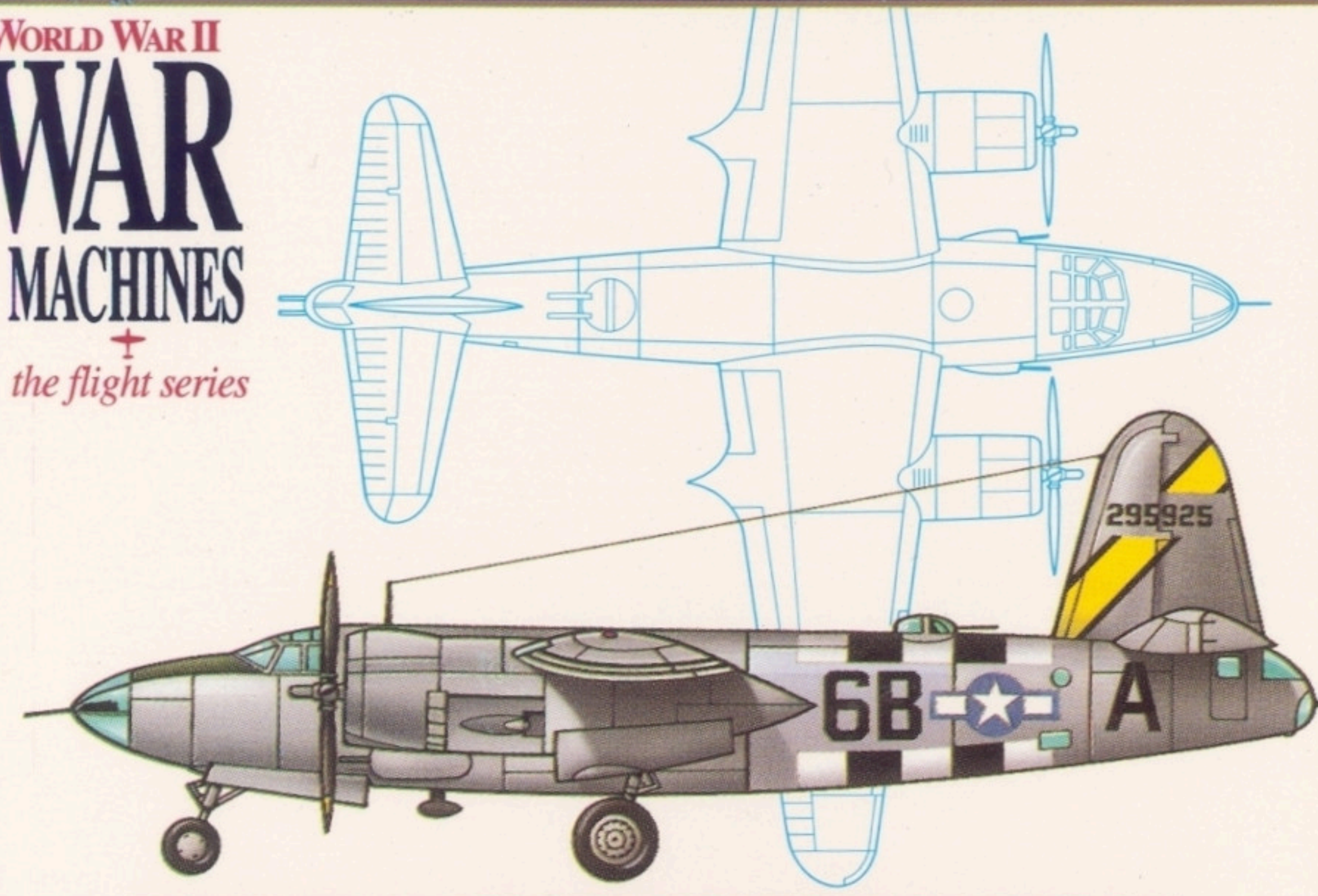
B-25H MITCHELL

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B-25J MITCHELL

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WAR
MACHINES
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the flight series



B-26B MARAUDER

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WAR
MACHINES
+
the flight series



B-29A SUPERFORTRESS

WORLD WAR II
**WAR
MACHINES**
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the flight series

19

**Boeing
B-17F
Flying
Fortress**

First Printing
RG
the richards group, inc.

The Fortress served in the Pacific and Mediterranean, but it was over northern Europe that it was to leave its mark. In 1942 the 8th Air Force began daylight strategic bombing with B-17Es and Fs. These missions revealed some of the B-17's many attributes - they could take incredible damage and they possessed tremendous defensive firepower. The nose was the least defensible position and Luftwaffe fighters exploited this weakness with head-on, or rolling frontal attacks. Shown here is the Memphis Belle, 324th Bomb Sqd., 91st Bomb Group. She was one of the first B-17s to survive fighters and flak and complete 25 combat missions over Germany.

Performance:
Maximum 299 m.p.h. at 25,000 ft.
Range:
1,850 - 2,100 miles with normal load, longer with reduced loads
Engines:
Four 1,200 h.p. 9 cylinder Wright R-1820-97 air-cooled radials

Armament:
Twelve .50 in. MGs, and 6,000 lb. bomb load, maximum 17,600 lb.
Dimensions:
Wing span 103 ft. 9 in. Length 74 ft. 9 in. Height 19 ft. 1 in.
Ceiling:
35,000 ft.

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**WAR
MACHINES**
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20

**Boeing
B-17G
Flying
Fortress**

First Printing
RG
the richards group, inc.

A total of 12,731 B-17s of all types were built between 1939 and 1945. Of that total, 8,680 were the "G" model which entered service with the 8th and 15th Air Forces towards the end of 1943. B-17Gs featured a "chin" turret mounting twin "fifties" designed to combat frontal assaults by enemy fighters and it proved to be effective. In fact, B-17 crews claim more enemy fighters per combat sortie than any other US aircraft, including fighters. Towards the end of the war in Europe, US aircraft retained their natural metal finish. This B-17G carries the markings of the 364th Bomb Sqd., 305th Bomb Group, 8th Air Force in late 1944.

Performance:
Maximum 287 m.p.h. at 25,000 ft.
Range:
1,850 - 2,100 miles with normal load, longer with reduced loads
Engines:
Four 1,200 h.p. 9 cylinder Wright R-1820-97 air-cooled radials

Armament:
Thirteen .50 in. MGs, 6,000 lb. bomb load, maximum 17,600 lb. bomb load
Dimensions:
Wing span 103 ft. 9 in., Length 74 ft. 9 in., Height 19 ft. 1 in.
Ceiling:
35,600 ft.

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**WAR
MACHINES**
+
the flight series

21

**Consolidated
B-24D
Liberator**

First Printing
RG
the richards group, inc.

In early 1942, the B-24D began sharing combat duty with the B-17. The two "heavies" flew side by side in Europe, but in the Pacific, the B-24 dominated. This was due to the B-24's longer range and heavier bomb load. B-24Ds will always be remembered for the daring and costly attack on Romania's Ploesti oil fields on August 1, 1943. 164 B-24s departed Benghazi Libya, flew over 1,000 miles and bombed the target at altitudes as low as 50 feet. 54 B-24s were lost and 55 returned heavily damaged. This desert pink 15th AF, 98th Bomb Group B-24D (Chug a Lug) participated in the raid and went on to complete 105 missions.

Performance:
Maximum 303 m.p.h. at 25,000 ft.
Range:
2,850 miles
Engines:
Four 1,200 h.p. 14 cylinder Pratt & Whitney R-1830-43 air-cooled radials

Armament:
Ten to eleven .50 in. MGs, and an 8,000 lb. bomb load
Dimensions:
Wing span 110 ft., Length 66 ft. 4 in., Height 17 ft. 11 in.
Ceiling:
32,000 ft.

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**WAR
MACHINES**
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the flight series

22

**Consolidated
B-24J
Liberator**

First Printing
RG
the richards group, inc.

By war's end an astonishing total of 18,188 Liberators were built - more than any other US bomber. Of that total, 6,678 were B-24Js - the most produced version of the B-24. Slightly longer than the "D", it refined the original design and added the protection of a nose turret. It has been said that the B-24 was not capable of taking as much punishment as the B-17 and as a result was not as popular with crews. It can also be argued that the B-24 proved more versatile, serving as tanker, transport, reconnaissance and anti-sub aircraft as well as bomber. This B-24J carries the markings of the 787th Bomb Sqd, 466th Bomb Group, 8th Air Force.

Performance:
Maximum 290 m.p.h. at 25,000 ft.
Range:
2,100 miles
Engines:
Four 1,200 h.p. 14 cylinder Pratt & Whitney R-1830-65 air-cooled radials

Armament:
Ten .50 in. MGs, and a 8,800 lb. bomb load
Dimensions:
Wing span 110 ft. Length 67 ft. 2 in., Height 18 ft.
Ceiling:
28,000 ft.

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MACHINES**
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the flight series

23

**North
American
B-25C/D
Mitchell**

First Printing
RG
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The B-25 is perhaps the best known US medium bomber due to Lt. Col. Doolittle's famous raid on Tokyo in April of 1942. That raid employed 16 B-25Bs flown from the deck of the USS Hornet. By war's end, six major variants of the B-25 had been produced, it had served on all fronts, and many believe it had become the most effective medium bomber of the war. The first of 3,909 B-25Cs andDs (identical models produced at different plants) became available in early 1942 and immediately saw combat in North Africa and the South West Pacific. This B-25D displays the markings of the 501st Bomb Sqd., 345th Bomb Group, 5th Air Force, SW Pacific mid-1943.

Performance:
Maximum 285 m.p.h. at 15,000 ft.
Range:
1,500 miles
Engines:
Two 1,700 h.p. 14 cylinder Wright R-2600-13 air-cooled radials

Armament:
Five to eight .50 in. MGs and a 3,000 lb. bomb load
Dimensions:
Wing span 67 ft. 7 in., Length 52 ft. 11 in. Height 15 ft. 9 in.
Ceiling:
21,200 ft.

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the flight series

24

**North
American
B-25H
Mitchell**

First Printing
RG
the richards group, inc.

The B-25H was a response to the need for additional fire-power in the Pacific theater. With the B-25G and the B-25H, the aircraft's armament was completely revised. Most notable was the shortened solid nose that replaced the original glazed version. Packed inside were 4 machine guns and a 75 mm cannon. On each side of the nose, 4 additional machine guns were mounted. This impressive arrangement proved to be particularly effective against ships and ground targets. A total of 1,000 B-25Hs were built for operations in the Pacific and they started arriving in 1944. This aircraft carries the colorful markings of the 823rd Bomb Squadron, 38th Bomb Group, 5th Air Force.

Performance:
Maximum 275 m.p.h. at 15,000 ft.
Range:
1,500 miles
Engines:
Two 1,700 h.p. 14 cylinder Wright R-2600-13 air-cooled radials

Armament:
Fourteen .50 in. MGs, one 75 mm cannon, 3,000 lb. bomb load
Dimensions:
Wing span 67 ft. 7 in., Length 51 ft. Height 15 ft. 9 in.
Ceiling:
Approximately 21,200 ft.

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WORLD WAR II
**WAR
MACHINES**
+
the flight series

25

**North
American
B-25J
Mitchell**

First Printing
RG
the richards group, inc.

The B-25J was the final and most numerous production version of the Mitchell - 4,318 were built. In fact there were two versions of the "J", one with a glazed nose for the traditional bombing role and one with a solid nose for use as a gunship. The gunship version carried no fewer than 8 machine guns in the nose. Combined with 4 guns in packs on both sides of the cockpit and the 2 in the dorsal turret, the gunship could bring 14 machine guns to bear on a target during a strafing run. A total of 800 B-25J gunships were built. The aircraft on this card displays the markings of the 42nd Bomb Group (the Crusaders), 13th Air Force, SW Pacific in late 1944.

Performance:
Maximum 272 m.p.h. at 13,000 ft.
Range:
1,350 miles
Engines:
Two 1,700 h.p. 14 cylinder Wright R-2600-29 air-cooled radials

Armament:
Eighteen .50 in. MGs, and a 3,000 lb. bomb load
Dimensions:
Wing span 67 ft. 7 in., Length 52 ft. 11 in., Height 15 ft. 9 in.
Ceiling:
Approximately 24,200 ft.

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WORLD WAR II
**WAR
MACHINES**
+
the flight series

26

**Martin
B-26B
Marauder**

First Printing
RG
the richards group, inc.

The Army's 1939 specification called for speed and Martin responded with the "hot rod" of US medium bombers. The Martin design used a low drag fuselage and small wing area. The small wing area necessitated high landing and take off speeds, and in the hands of inexperienced pilots the B-26 was a demanding aircraft. Frequent training accidents led to the famous adage, *One a day in Tampa Bay*. In the hands of experienced 9th Air Force pilots, the B-26 had the lowest operational loss rate of any US bomber over Europe. Used in the Pacific as well, the B-26 performed best as a tactical bomber. 5,157 B-26s were built, among them, this 9th Air Force B-26B from the 397th Bomb Group.

Performance:
Maximum 310 m.p.h. at 14,500 ft.
Range:
1,150 miles
Engines:
Two 2,000 h.p. 18 cylinder Pratt & Whitney R-2899-43 air-cooled radials

Armament:
Eleven .50 in. MGs and a 4,000 lb. bomb load
Dimensions:
Wing span 71 ft., Length 56 ft. 1 in., Height 20 ft. 4 in.
Ceiling:
Approximately 23,000 ft.

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WORLD WAR II
**WAR
MACHINES**
+
the flight series

27

**Boeing
B-29A
Superfortress**

First Printing
RG
the richards group, inc.

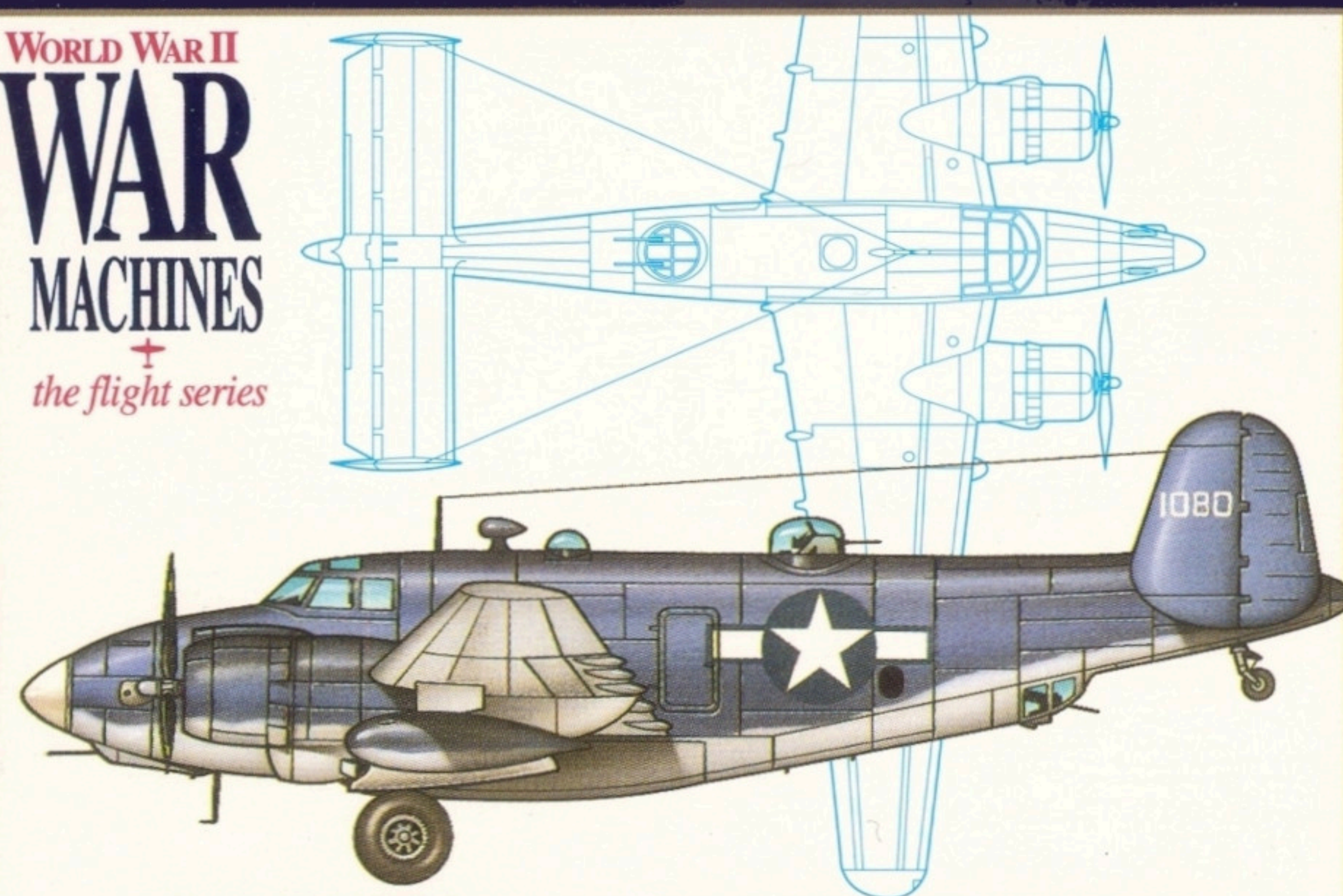
3,970 B-29 strategic bombers were built during WWII. First flown in 1942 and delivered to operational units in 1943, the B-29 was used exclusively against Japanese targets. Raids against the Japanese mainland were first flown from bases in China and India in mid-1944. The long combat range of the B-29s made raids from these far-flung bases possible. Effective high-level precision bombing proved difficult and it wasn't until bases in the Marianas were built and B-29s were switched to low level area devastation bombing, that raids had a major impact. This Tinian (Marianas) based B-29 served with the 313 Bomb Wing, 504th Bomb Group in July of 1945.

Performance:
Maximum 358 m.p.h. at 25,000 ft.
Range:
4,100 miles
Engines:
Four 2,200 h.p. 18 cylinder Wright R-3350-57 air-cooled radials

Armament:
Ten .50 in. MGs, one 20 mm cannon, 20,000 lb. bomb load
Dimensions:
Wing span 141 ft. 3 in., Length 99 ft., Height 29 ft. 7 in.
Ceiling:
31,850 ft.

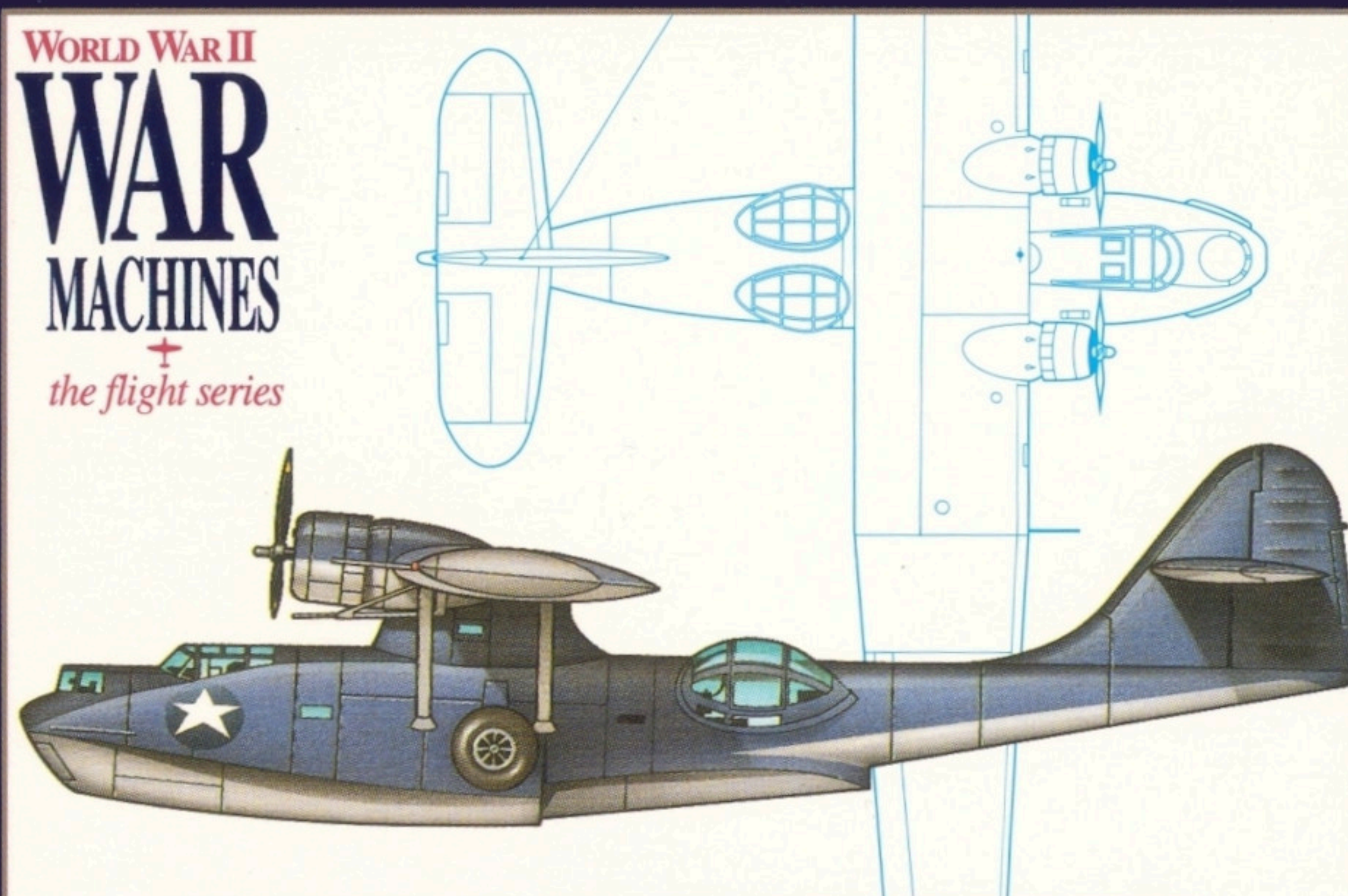
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WAR
MACHINES
+
the flight series



PV-2 HARPOON

WORLD WAR II
WAR
MACHINES
+
the flight series



PBY-5A CATALINA

WORLD WAR II
WAR
MACHINES
+
the flight series



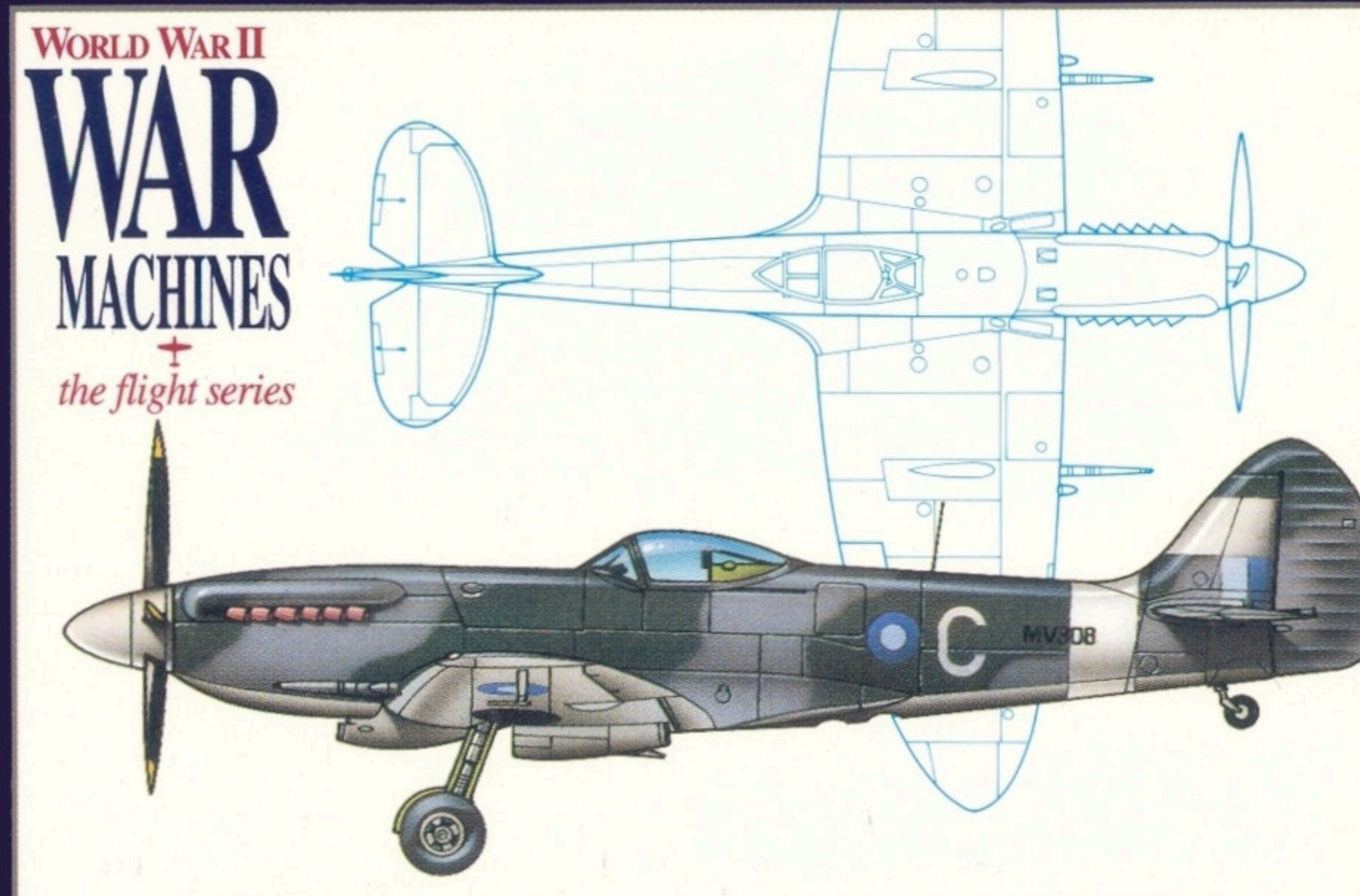
SPITFIRE MK.I

WORLD WAR II
WAR
MACHINES
+
the flight series



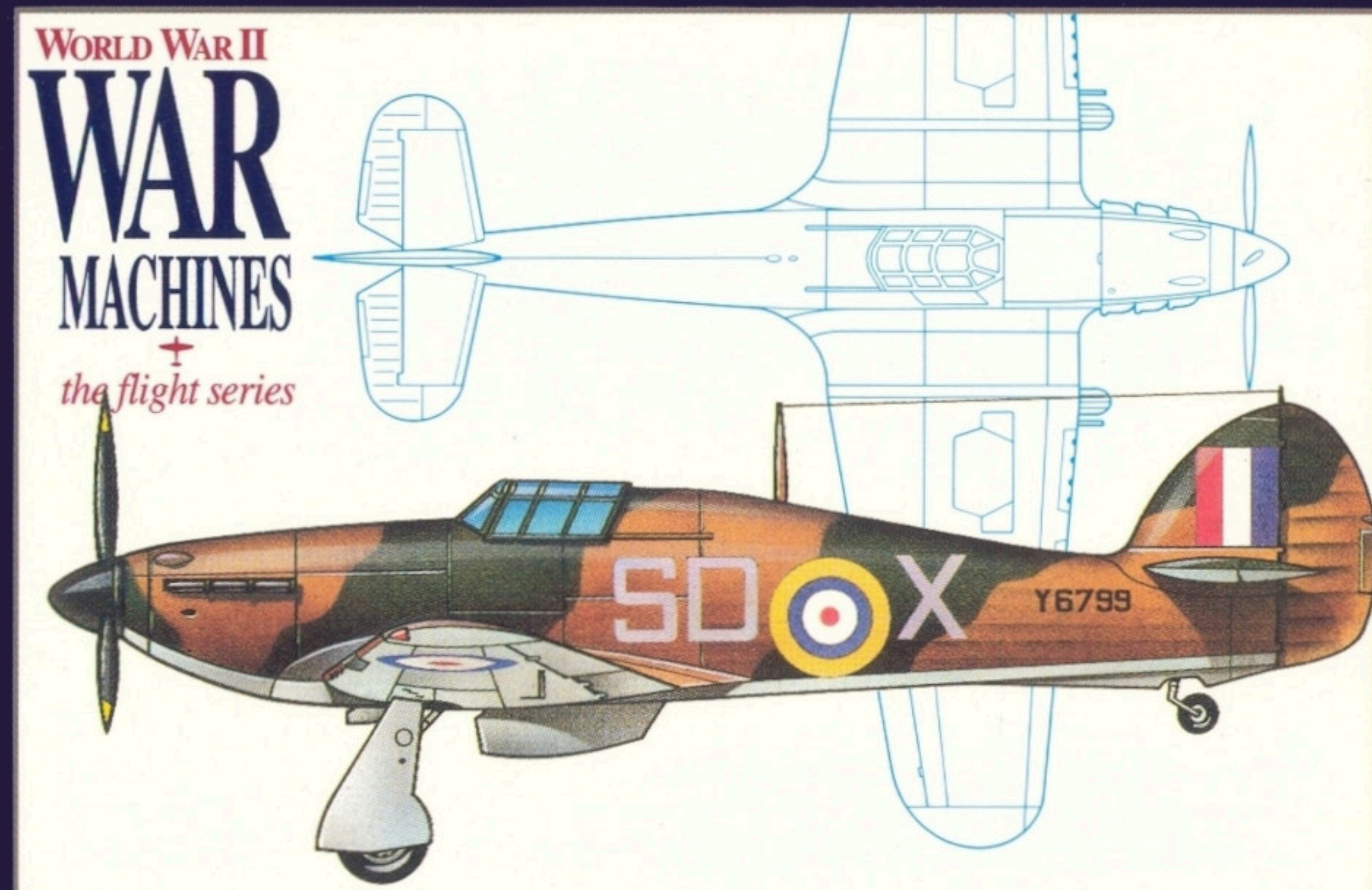
SPITFIRE MK.IX

WORLD WAR II
WAR
MACHINES
+
the flight series



SPITFIRE MK. XIV

WORLD WAR II
WAR
MACHINES
+
the flight series



HURRICANE MK. I

WORLD WAR II
WAR
MACHINES
+
the flight series



TYPHOON MK. IB

WORLD WAR II
WAR
MACHINES
+
the flight series



METEOR MK. I

WORLD WAR II
WAR
MACHINES
+
the flight series



SWORDFISH MK. I

WORLD WAR II
**WAR
MACHINES**
+
the flight series

28

**Lockheed
PV-2
Harpoon**

First Printing
RG
the richards group, inc.

Like the Hudson patrol bomber before it, the Harpoon was based on a commercial aircraft - the Lockheed Model 18. It was adapted for military use by making provisions for guns to be carried in the nose, in a dorsal turret and in a ventral position at the rear of the aircraft. With an internal bomb bay and strongpoints on each of the wings, the Harpoon was able to carry bombs, depth charges, mines, rockets and external fuel tanks and was well suited for the role of reconnaissance/patrol bomber. It served in this capacity for the US Navy primarily in the Pacific starting in 1944. Lockheed built 500 Harpoons for use by the US Navy.

Performance:

Maximum 282 m.p.h. at 13,700 ft.

Range:

900 to 1,790 miles dependent on load

Engines:

Two 2,000 h.p.

Pratt & Whitney R-2800-31

air-cooled radials

Armament:

Nine .50 in MGs in nose, fuselage

and dorsal turret, and up to a

4,000 lb. bomb load

Dimensions:

Wing span 75 ft., Length

51 ft. 5 in., Height 13 ft. 3 in.

Ceiling:

24,700 ft.

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WORLD WAR II
**WAR
MACHINES**
+
the flight series

29

**Consolidated
PBV-5A
Catalina**

First Printing
RG
the richards group, inc.

Asked to name one Flying Boat used in WWII, most aviation enthusiasts will name the "Cat". PBVs played a prominent role in the war in the Pacific and the exploits of this 1930s design are legendary. They performed daring rescues of downed airmen, long-range reconnaissance missions and anti-submarine patrols. These lumbering giants even made night torpedo bombing raids on Japanese shipping. It was a PBV that located the Japanese fleet at the battle of Midway and it was primarily as a scout and reconnaissance aircraft that the PBV made its invaluable contribution to the US war effort. Over 3,000 PBVs were built, 794 being PBV-5A amphibians like the one shown.

Performance:

Maximum 179 m.p.h. at 7,000 ft.

Range:

2,370 miles

Engines:

Two 1,200 h.p. 14 cylinder Pratt

& Whitney R-1830-82

air-cooled radials

Armament:

Five .50 in MGs and maximum

4,000 lb. bomb/torpedo load

Dimensions:

Wing span 104 ft., Length

63 ft. 10 in., Height 20 ft. 2 in.

Ceiling:

18,000 ft.

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WORLD WAR II
**WAR
MACHINES**
+
the flight series

30

**Supermarine
Spitfire
Mk. I**

First Printing
RG
the richards group, inc.

The legendary Spitfire had its origins in the Supermarine sea-planes of the 1920s and 1930s. The prototype was first flown in 1936 and the first operational Mark Is were delivered in June of 1938. Designed as a "home defense" fighter it carried only 85 gallons of fuel, limiting range and providing only 15 minutes of combat time once at altitude. Deliveries of the Mk. II began in June of 1940, and on the eve of the Battle of Britain, 292 Mk. Is & IIs equipped 19 squadrons. Along with over 450 Hurricanes, it was enough to provide the first real turning point in the war. This Mk. I carries early war camouflage and the markings of No. 19 Squadron based at Duxford during the Battle of Britain.

Performance:

Maximum 360 m.p.h. at 19,000 ft.

Range:

395 miles on internal fuel

Engine:

1,030 h.p. 12 cylinder

liquid-cooled

Rolls Royce Merlin II

Armament:

Eight .30 in. MGs, 4 per wing

Dimensions:

Wing span 36 ft. 10 in.,

Length 29 ft. 11 in.,

Height 11 ft. 5 in.

Ceiling:

34,200 ft.

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WORLD WAR II
**WAR
MACHINES**
+
the flight series

31

**Supermarine
Spitfire
Mk. IX**

First Printing
RG
the richards group, inc.

The beauty of the Spitfire's design was that its basic form could continually be refined to meet new challenges. The Mk. V - a refined, more powerfully engined Mk. I/II - was the equal of Bf 109Es and Fs. Almost 6,500 were built and it was the RAF's primary fighter in 1941-42. In late 1941 Fw 190s started to appear and they proved to be superior to the Mk. V. To meet the challenge, a Merlin 61 engine and a 4-blade prop were installed in a Mk. V air-frame. The resulting Mk. IX is still regarded by many as the best Spitfire produced. 5,665 Mk. IXs, like this one from No. 485 Squadron, were built making it the second most produced Spitfire.

Performance:

Maximum 408 m.p.h. at 19,000 ft.

Range:

434 miles on internal fuel

980 miles with drop tanks

Engine:

1,660 h.p. 12 cylinder

liquid-cooled

Rolls Royce Merlin 61

Armament:

Two 20 mm cannon and four

.30 in MGs

Dimensions:

Wing span 36 ft. 10 in.,

Length 31 ft. 4 in.,

Height 11 ft. 5 in.

Ceiling:

45,000 ft. ft.

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WORLD WAR II
**WAR
MACHINES**
+
the flight series

32

**Supermarine
Spitfire
Mk. XIV**

First Printing
RG
the richards group, inc.

As the struggle between the Luftwaffe and the Allies continued, fighter development proceeded at a brisk pace. Spitfires utilized ever more powerful engines like the Griffon 65, which was designed for maximum power at high altitude. When this engine was mated to a five blade prop and a modified airframe, a superb high altitude fighter emerged. It started to equip units in January of 1944, became the first Allied Fighter to down a Me 262 jet, and was responsible for destroying over 300 V-1 flying bombs. Some, like the late model Mk. XIV on this card fought in the final struggle against the Japanese in South East Asia. 957 were produced.

Performance:

Maximum 448 m.p.h. at 26,000 ft.

Range:

460 miles on internal fuel

850 miles with drop tanks

Engine:

2,050 h.p. 12 cylinder

liquid-cooled

Armament:

Two 20 mm cannon and four

.30 in MGs

Dimensions:

Wing span 36 ft. 10 in.,

Length 32 ft. 8 in.,

Height 12 ft. 8 in.

Ceiling:

44,500 ft.

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WORLD WAR II
**WAR
MACHINES**
+
the flight series

33

**Hawker
Hurricane
Mk I**

First Printing
RG
the richards group, inc.

The Hurricane's moment in history came during the Battle of Britain when it shared combat duties with the Spitfire. By that time Britain had over 2,000 examples of this mid-1930's design on hand. While Spitfires engaged German fighters, Hurricanes attacked the bombers; a role they excelled in. The Hurricane's performance was generally inferior to that of the escorting Bf 109Es, and by 1942 it was no longer judged to be an effective interceptor in Europe. Hurricanes were switched to the ground attack and fighter-bomber role which they performed effectively in the skies over Europe, Burma and North Africa. In all 12,780 were produced in the UK.

Performance:

Maximum 318 m.p.h. at 17,500 ft.

Range:

460 miles on internal fuel

900 miles with drop tanks

Engine:

1,030 h.p. 12 cylinder

liquid-cooled Rolls Royce

Armament:

Eight .30 in. MGs, 4 per wing

Dimensions:

Wing span 40 ft.,

Length 31 ft. 5 in.,

Height 13 ft. 1 in.

Ceiling:

34,200 ft.

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WORLD WAR II
**WAR
MACHINES**
+
the flight series

34

**Hawker
Typhoon
Mk. IB**

First Printing
RG
the richards group, inc.

The Typhoon was supposed to replace the Hurricane as a fighter but it proved disappointing with poor performance characteristics at high altitude. It did have excellent low altitude performance and this was used to intercept hit-and-run raids by fast, low flying Fw 190s in 1942. Typhoons were then used as ground attack platforms and in this role they excelled. In cross-channel sweeps during 1943-44, they destroyed locomotives, other transport and armored vehicles. Typhoons fitted with two 1,000 lb. bombs and eight 3 inch rockets devastated German tanks at Caen and Falaise following the D-Day landings. This early Typhoon, circa 1943, carries standard day-fighter colors.

Performance:

Maximum 412 m.p.h. at 19,000 ft.

Range:

510 miles with bombs,

980 miles with drop tanks

Engine:

2,180 h.p. 24 cylinder liquid-

cooled Napier Sabre II A

Armament:

Four 20 mm cannon, 2 per wing,

and 2,000 lbs. of bombs/rockets

Dimensions:

Wing span 41 ft. 7 in., Length

31 ft. 11 in., Height 15 ft. 3 in.

Ceiling:

35,200 ft.

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MACHINES**
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the flight series

35

**Glouster
Meteor
Mk. I**

First Printing
RG
the richards group, inc.

The development of the Meteor began in August of 1940 and progressed slowly until the first flight in March of 1943. It became the first and only Allied jet fighter to enter service during WWII. Twenty Meteor Is became operational in July of 1944 with 16 of these going to No. 616 Squadron. There are no recorded encounters between Me 262 jets and Meteors; however, the Meteor was used successfully against the German V-1 Flying Bombs. In the first of these meetings, the V-1 was not shot down but plunged to earth when the Meteor pilot used his own wing to tip the V-1 over. The Meteor Mk. I on this card carries the markings of 616 Squadron.

Performance:

Maximum 410 m.p.h. at 30,000 ft.

Range:

Approximately 1,000 miles

Engine:

Two 1,700 lb. thrust

Rolls Royce

turbojets

Armament:

Four 20 mm cannon in nose

Dimensions:

Wing span 43 ft.,

Length 41 ft. 4 in.,

Height 13 ft.

Ceiling:

40,000 ft.

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WORLD WAR II
**WAR
MACHINES**
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the flight series

36

**Fairey
Swordfish
Mk. I**

First Printing
RG
the richards group, inc.

No study of WW II British aircraft can ever be complete without the Swordfish. When the war began in 1939, the "Stringbag" as it was known to its crews, was the Fleet Air Arm's major offensive weapon. Obsolete when the war began, this rugged, fabric covered torpedo bomber was in service until 1945. 2,391 were produced. The Swordfish achieved immortal fame in November 1940 when 20 of these ancient looking bi-planes from the carrier Illustrious sank three of Italy's six battleships in Taranto harbor. In May 1941, Swordfish from the Ark Royal crippled the German battleship Bismark, enabling British surface forces to sink her.

Performance:

Maximum 139 m.p.h. at 4,750 ft.

(without torpedo)

Range:

546 miles with torpedo

Engine:

690 h.p. Bristol-Pegasus

9 cylinder air-cooled radia

Armament:

One 1,610 lb. torpedo, or

1,500 lbs. of bombs, 2 MGs

Dimensions:

Wing span 45 ft. 6 in., Length

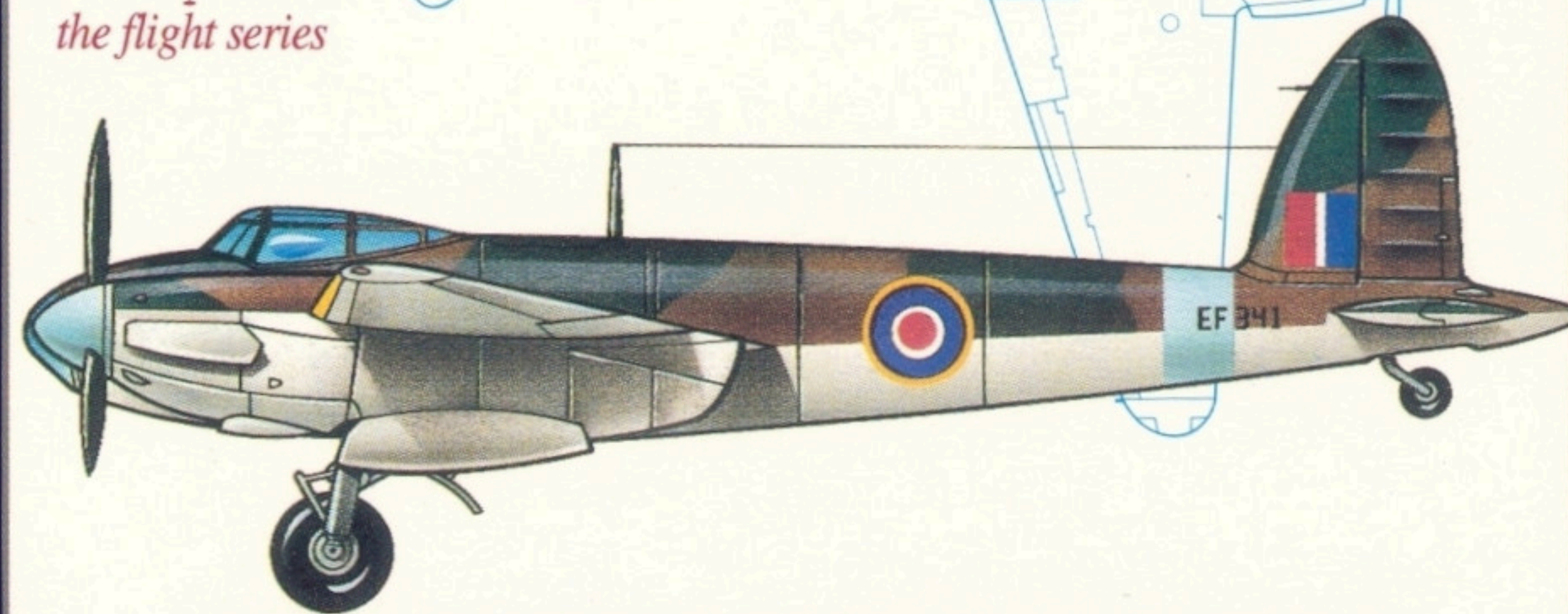
36 ft. 4 in., Height 12 ft. 10 in.

Ceiling:

10,700 ft.

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WORLD WAR II
WAR
MACHINES
+
the flight series



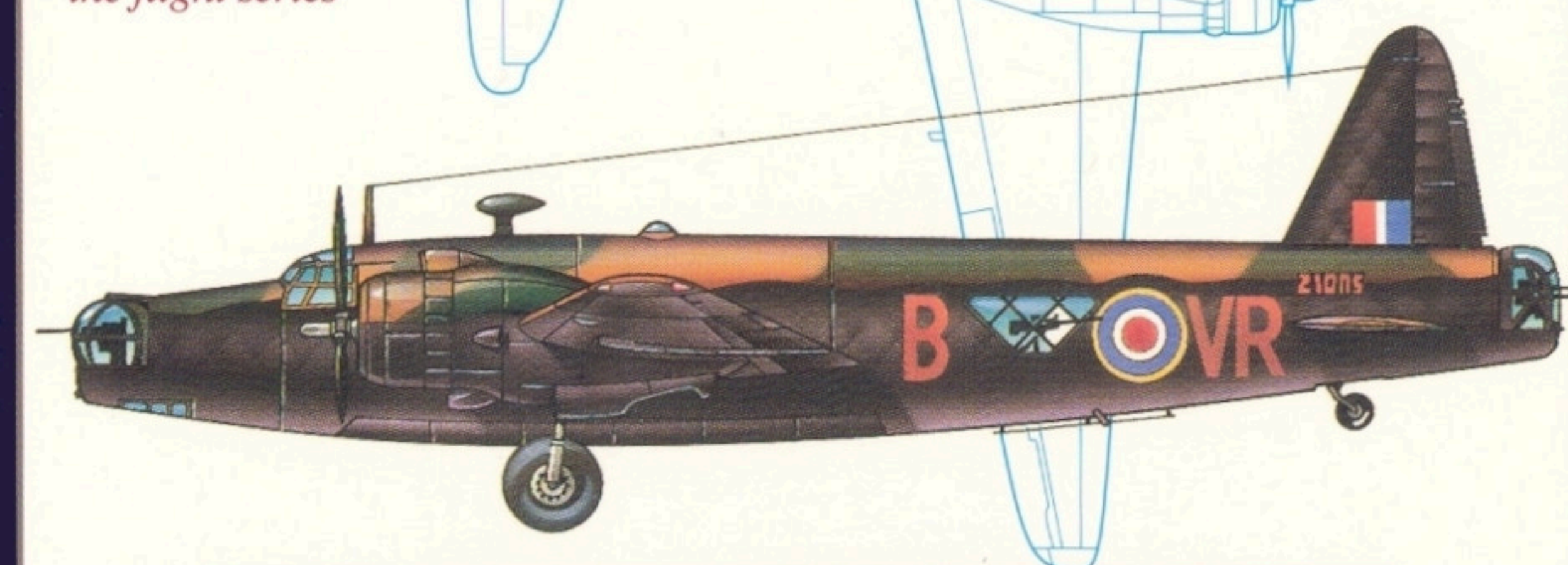
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MACHINES
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the flight series



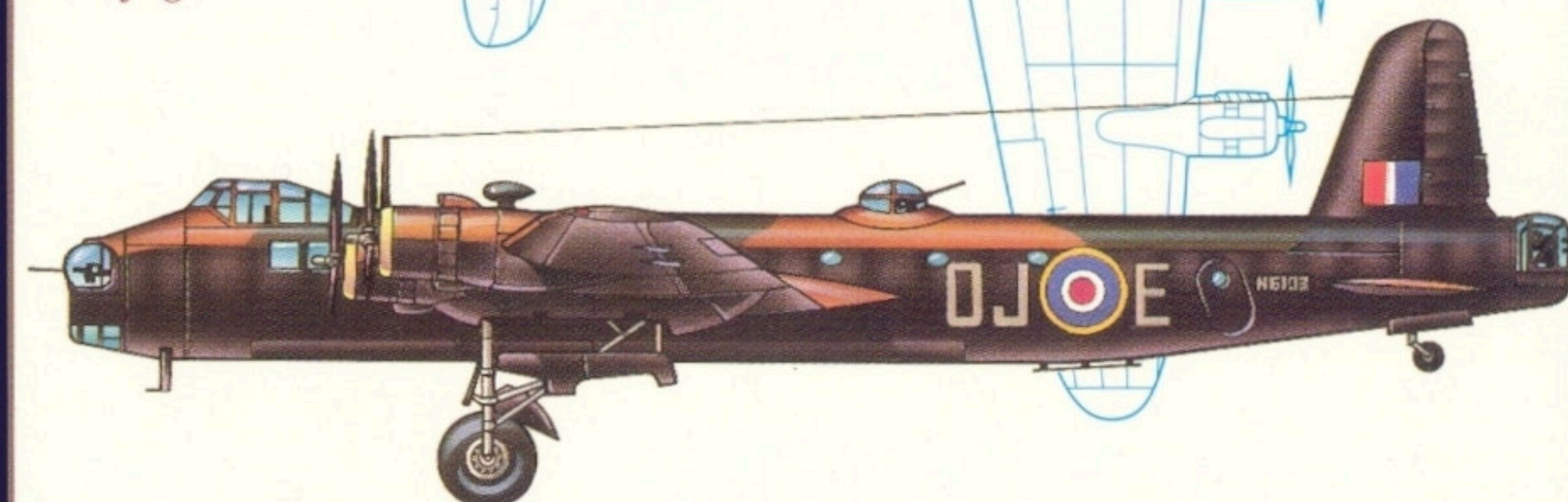
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WORLD WAR II
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MACHINES
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the flight series



WELLINGTON MK. III

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MACHINES
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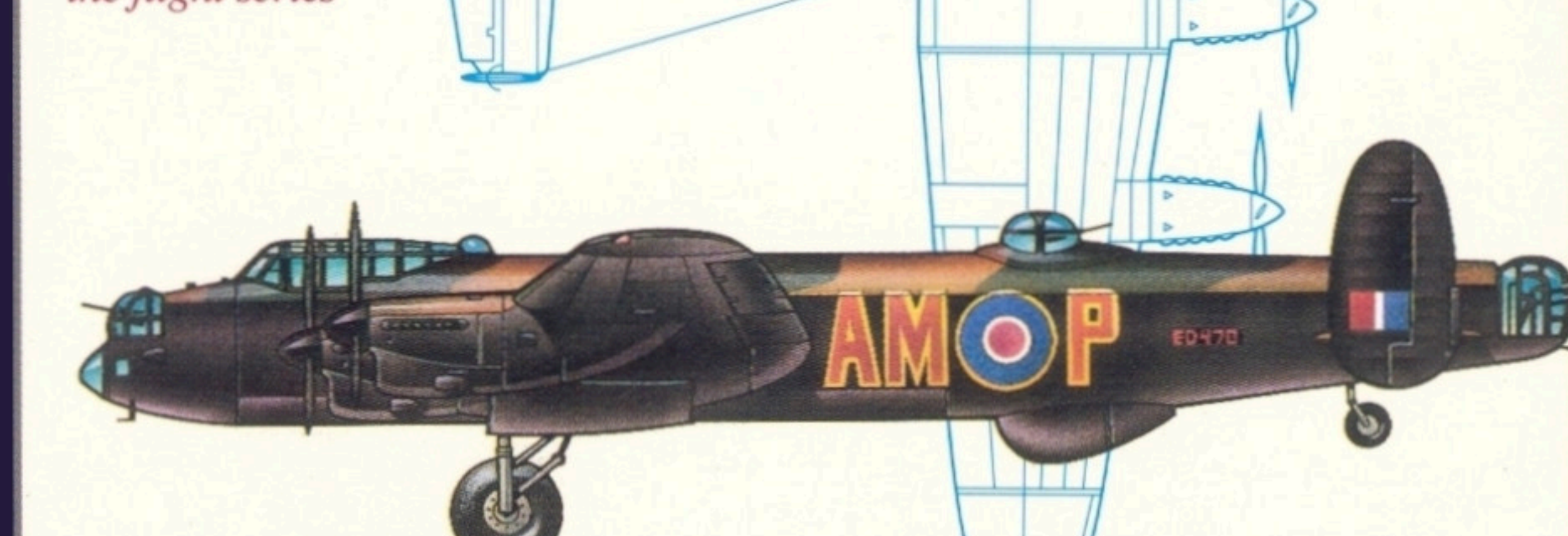
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the flight series



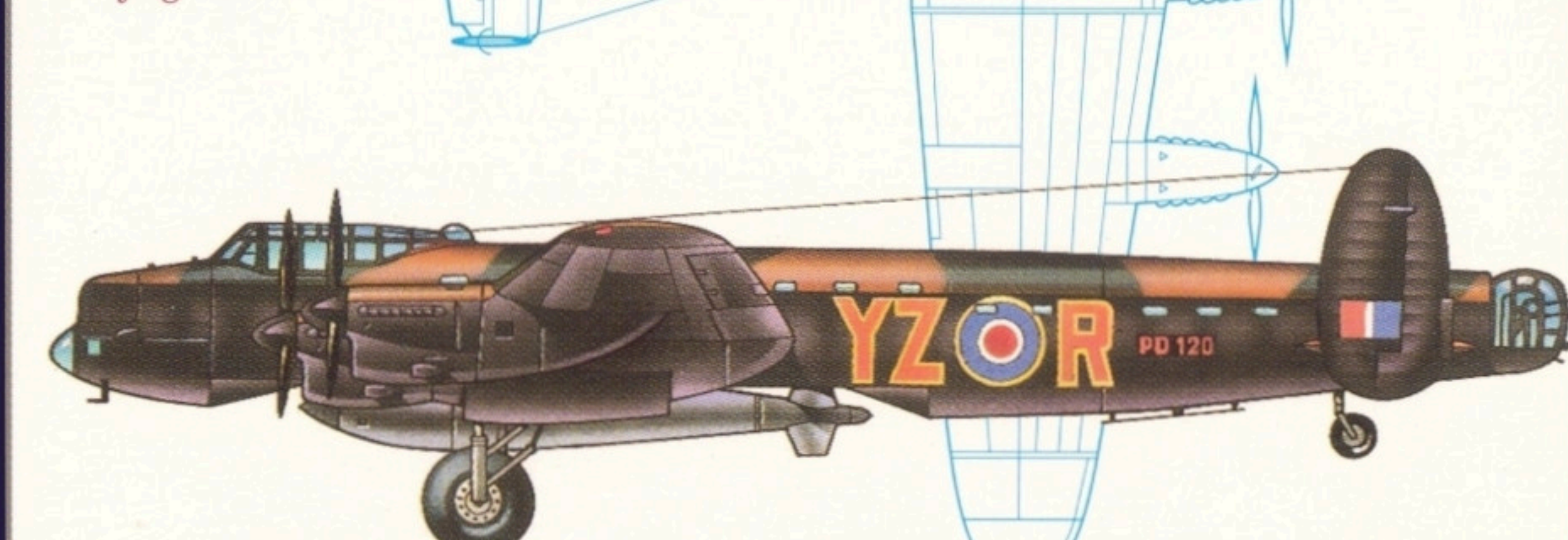
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MACHINES
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the flight series



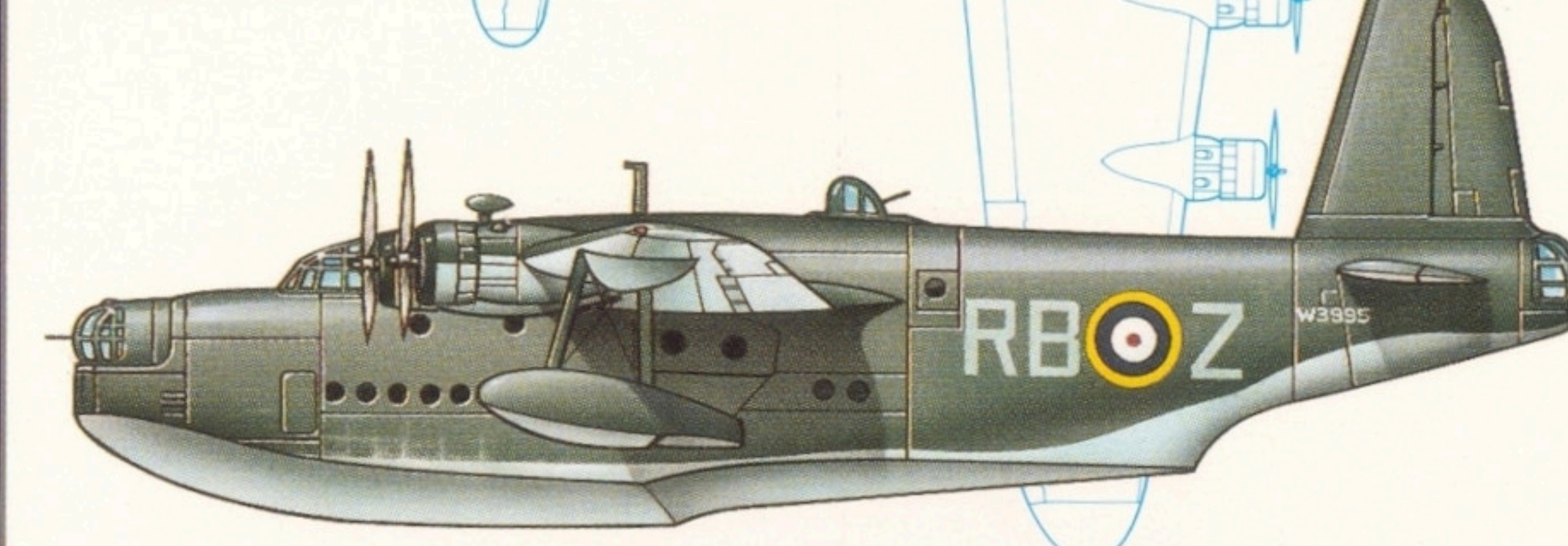
LANCASTER MK. III

WORLD WAR II
WAR
MACHINES
+
the flight series



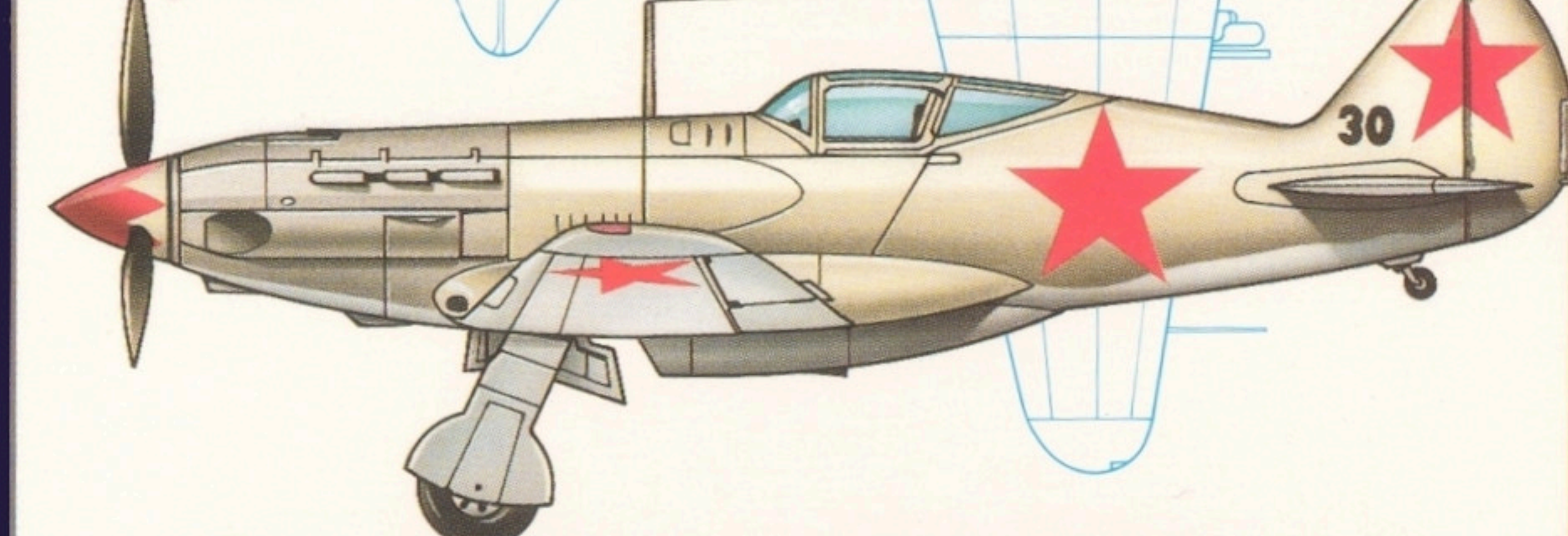
LANCASTER MK. I SPECIAL

WORLD WAR II
WAR
MACHINES
+
the flight series



SUNDERLAND MK. III

WORLD WAR II
WAR
MACHINES
+
the flight series



MIG-3

WORLD WAR II
WAR
MACHINES
+
the flight series

37

**de Havilland
Mosquito
Mk. IV
Series II**

First Printing
RG
the richards group, inc.

A superlative British light bomber, the Mosquito was constructed of wood and carried no defensive armament. It relied on speed and fighter-like agility to elude interceptors. True to its name-sake, the Mosquito was a nuisance to the Germans, unexpectedly appearing deep in occupied Europe to bomb priority targets. High speed, low level daylight attacks were its speciality, and its pin-point accuracy in hitting targets such as railway tunnels, V1 rocket sites and even Gestapo HQ, was legendary. The Mosquito also excelled as a night fighter, fighter-bomber and recon aircraft. It delivered the last RAF bombload of the war on Germany on May 2, 1945.

Performance:

Maximum 380 m.p.h. at 17,000 ft

Range:

Approximately 2,000 miles

Engines:

Two 1,250 h.p. 12 cylinder
liquid-cooled
Rolls Royce Merlin XXIs

Armament:

Four 500 lb. bombs

Dimensions:

Wing span 54 ft.,
Length 40 ft. 9 in.,
Height 15 ft. 3 in.
Ceiling:
28,800 ft.

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WORLD WAR II
WAR
MACHINES
+
the flight series

38

**Bristol
Beaufighter
Mk. IF**

First Printing
RG
the richards group, inc.

The Beaufighter was an extremely versatile long range heavy fighter and attack aircraft. It used the wings and many other components of another Bristol aircraft - the indifferent Beaufort torpedo bomber. The Beaufighter operated in Europe, the Mediterranean, Middle East and the Pacific. The Japanese called it "Whispering Death" and the German night blitz of 1940-41 ground to a halt in part because of the radar fitted night fighting Beaufighters. These remarkable aircraft also performed anti-shipping duty armed with torpedos and rockets. A total of 5,500 Beaufighters were built - including this Mk I night fighter.

Performance:

Maximum 328 m.p.h. at 15,000 ft.

Range:

1,170 miles maximum

Engines:

Two 1,590 h.p. 14 cylinder
Bristol Hercules
air-cooled radials

Armament:

Four 20 mm cannon (nose),
six .30 in. MGs (wings)

Dimensions:

Wing span 57 ft. 10 in.,
Length 41 ft. 4 in.,
Height 15 ft. 10 in.
Ceiling:
28,900 ft.

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WORLD WAR II
WAR
MACHINES
+
the flight series

39

**Vickers
Wellington
Mk. III**

First Printing
RG
the richards group, inc.

When the war began, Britain's strategic bomber force consisted of the twin-engined Wellington, Whitely and Hampden. Of the three, only the Wellington served as a front-line aircraft after 1942. Designed to a 1932 requirement, the "Wimpey" as it was called, was the mainstay of Bomber Command early in the war. Its unusual geodetic structure gave it great strength, but losses on daylight raids were so high that Bomber Command switched to night raids - a role the "Wimpey" performed until 1943. By 1945, 11,461 had been built - the Mk. III being the main early type. This Mk.III of 419 Squadron, R.C.A.F., displays standard colors employed by night bombers after 1940.

Performance:

Maximum 255 m.p.h. at 12,500 ft.

Range:

2,085 miles maximum

Engines:

Two 1,375 h.p. 14 cylinder
Bristol Hercules III
air-cooled radials

Armament:

Eight .30 in. MGs and a
4,500 lb. bomb load

Dimensions:

Wing span 86 ft. 2 in., Length
60 ft. 10 in., Height 17 ft.
Ceiling:
22,000 ft.

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WAR
MACHINES
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the flight series

40

**Short
Stirling
Mk. III**

First Printing
RG
the richards group, inc.

Britain used three heavy bombers in its strategic air campaign against Germany. The Stirling was the first to enter service (August 1940) and ultimately the least successful. The short, shoulder mounted wings were the cause of most of the shortcomings of this otherwise sound aircraft. The shoulder mounted wings necessitated very long and complicated landing gear and the short wing span caused performance to suffer, especially at higher altitudes. Initially used on daylight raids, the Stirling was switched to night bombing and, by the middle of 1943 few were in front line service. This Mk. III, one of over 2,000 Stirlings built, carries the markings of No. 149 Squadron.

Performance:

Maximum 270 m.p.h. at 14,000 ft.

Range:

590 miles with maximum bomb
load, 2,010 miles with 3,500 lbs.

Engines:

17,000 ft. Hercules XVI
air-cooled radials

Armament:

Eight .30 in. MGs and a maxi-
mum 14,000 lb. bomb load

Dimensions:

Wing span 99 ft. 1 in., Length
87 ft. 3 in., Height 22 ft. 9 in.
Ceiling:
17,000 ft.

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WAR
MACHINES
+
the flight series

41

**Handley
Page
Halifax
Mk. III**

First Printing
RG
the richards group, inc.

The Halifax was one of the famous trio of heavy bombers used by Bomber Command in the air campaign against Germany. The Halifax Mk. I went into service in late 1940 and was followed by several important Marks, the most notable being the Mk. III. This was perhaps the definitive version of the Halifax with its increased wingspan, powerful radial engines and H2S ground mapping radar housed in a ventral dome. Mk. IIIs began equipping squadrons in early 1944 and slightly over 2,000 were built. 6,100 examples (Mk. I - Mk. VII) of this excellent bomber were produced by 1945. The Mk. III on this card carries standard night bomber colors and the markings of No. 426 Squadron.

Performance:

Maximum 300 m.p.h. at 14,000 ft.

Range:

1,250 miles

Engines:

Four 1,615 h.p. 14 cylinder
Bristol Hercules XVI
air-cooled radials

Armament:

Nine .30 in. MGs and a maximum
13,000 lb. bomb load

Dimensions:

Wing span 104 ft. 2 in., Length
71 ft. 7 in., Height 20 ft. 9 in.
Ceiling:
24,000 ft.

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WAR
MACHINES
+
the flight series

42

**Avro
Lancaster
Mk. III**

First Printing
RG
the richards group, inc.

The last of Britain's famous trio of heavy bombers was the most successful and the most effective heavy night bomber of the war. Beginning life as the twin-engined Manchester (a failure), the "Lanc" evolved in 1941 when two additional engines were mated to a longer wing. The resulting Mk. I went into service in early 1942 and results exceeded all expectations. The "Lanc" had the best loss rate of all British "heavies"; 1 per every 132 tons of bombs dropped (Halifax-1 per 56 tons and Stirling-1 per 41 tons). Through several Marks and over 7,300 total aircraft, the Lancaster proved itself to be one of the greatest bombers in history.

Performance:

Maximum 287 m.p.h. at 11,500 ft

Range:

1,660 miles with maximum
bomb load

Engines:

Four 1,390 h.p. 12 cylinder
liquid-cooled
Rolls Royce Merlin 28s or 38s

Armament:

Eight .30 in. MGs and a maxi-
mum 14,000 lb. bomb load

Dimensions:

Wing span 102 ft.,
Length 69 ft. 6 in.,
Height 19 ft. 7 in.
Ceiling:
24,500 ft.

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WORLD WAR II
WAR
MACHINES
+
the flight series

43

**Avro
Lancaster
Mk. I
Special**

First Printing
RG
the richards group, inc.

The Lancaster was modified to perform special missions during the war. Stripped of most defensive weapons, H2S radar pod and bomb-bay, "Lancs" of No. 617 Sqd. destroyed several dams in Germany's Ruhr valley in May 1943 using special cylindrically shaped bombs. Delivered at an altitude of 60 ft., these weapons skipped along the water's surface until reaching the dam, then sank and exploded. Similarly modified "Lancs" were used to deliver the 12,000 lb. Tallboy bomb and three hits and several near misses by these massive weapons finally sank the battleship Tirpitz while at anchor in Norway in November 1944. This Mk. I Special of No. 617 Sqd. carries a Tallboy.

Performance:

Maximum 280 m.p.h. at 18,500 ft.

Range:

2,695 miles maximum

Engines:

Four 1,480 h.p. 12 cylinder
liquid-cooled
Rolls Royce Merlin XXs

Armament:

Four or six .30 in. MGs and a
maximum 22,000 lb. bomb load

Dimensions:

Wing span 102 ft., Length
69 ft. 6 in., Height 19 ft. 7 in.
Ceiling:
24,500 ft.

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WORLD WAR II
WAR
MACHINES
+
the flight series

44

**Short
Sunderland
Mk. III**

First Printing
RG
the richards group, inc.

Although the British used US built Catalinas, they also produced an outstanding flying-boat of their own. This was the Sunderland which had its origins in commercial flying boats of the early 1930s. First flown in 1937, the Sunderland was so successful that it served until 1959. Used for long-range reconnaissance and anti-submarine patrols, the Sunderland was heavily armed and capable of defending itself - the Germans called it the "Flying Porcupine". Sunderlands served in all major war theaters, including the North Sea, where running battles with German flying boats and maritime raiding Ju-88s were not unusual. Approximately 750 were built.

Performance:

Maximum 212 m.p.h. at 6,000 ft.

Range:

2,980 miles maximum

Engines:

Four 1,065 h.p. 9 cylinder
Bristol Pegasus XXII
air-cooled radials

Armament:

Ten .30 in. MGs and a
maximum 2,000 lb. bomb load

Dimensions:

Wing span 112 ft. 10 in., Length
85 ft. 4 in., Height 32 ft. 9 in.
Ceiling:
Approximately 18,000 ft.

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WORLD WAR II
WAR
MACHINES
+
the flight series

45

**Mikoyan
Gurevich
MiG-3**

First Printing
RG
the richards group, inc.

The famous line of MiG aircraft had its origins in WWII. The MiG 1 flew for the first time in early 1940 and the superficially similar MiG 3 entered service in the latter half of 1941. The MiGs were great technological leaps over earlier Soviet types, especially in the area of top speed, and both were used in the desperate efforts to slow the German invasion in 1941. In part because the MiG 3 was ineffective against German fighters except at high altitude, production ceased in late 1941 after over 2,000 aircraft had been built. MiG 3s served until 1943 as a high altitude reconnaissance aircraft. This MiG 3, in winter white, served as a fighter in late 1941.

Performance:

Maximum 398 m.p.h. at 25,500 ft.

Range:

Approximately 750 miles

Engine:

1,350 h.p. 12 cylinder
liquid-cooled
Mikulin AM-35A

Armament:

One 12.7 mm and two 7.62 mm
MGs, all in the nose

Dimensions:

Wing span 33 ft. 9 in.,
Length 26 ft.,
Height 8 ft. 6 in.
Ceiling:
Approximately 39,300 ft.

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WAR
MACHINES
the flight series



LAGG-3

WORLD WAR II
WAR
MACHINES
the flight series



LA-7

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WAR
MACHINES
the flight series



YAK-1

WORLD WAR II
WAR
MACHINES
the flight series



YAK-3

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MACHINES
the flight series



YAK-9

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WAR
MACHINES
the flight series



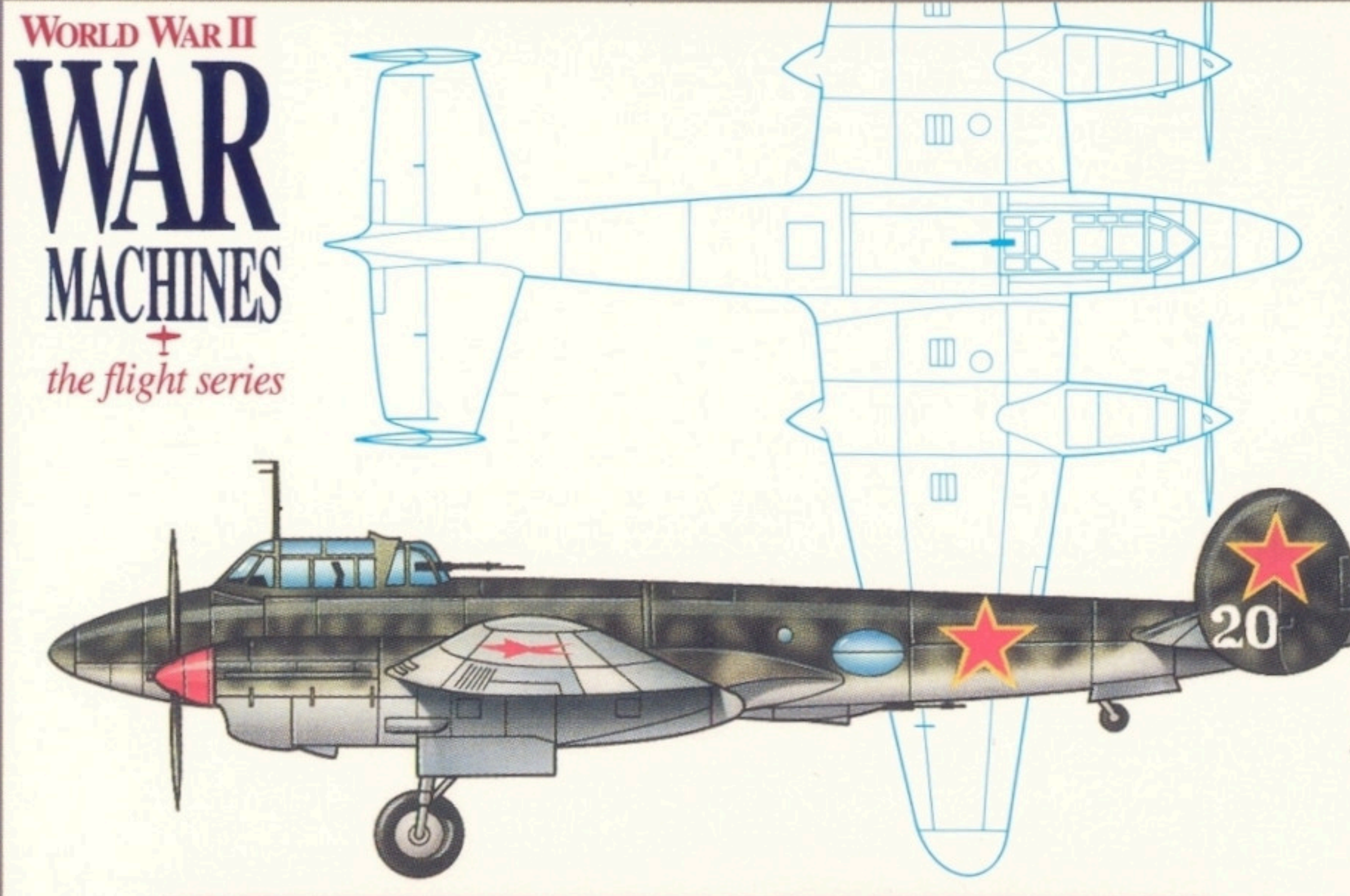
IL-2

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WAR
MACHINES
the flight series



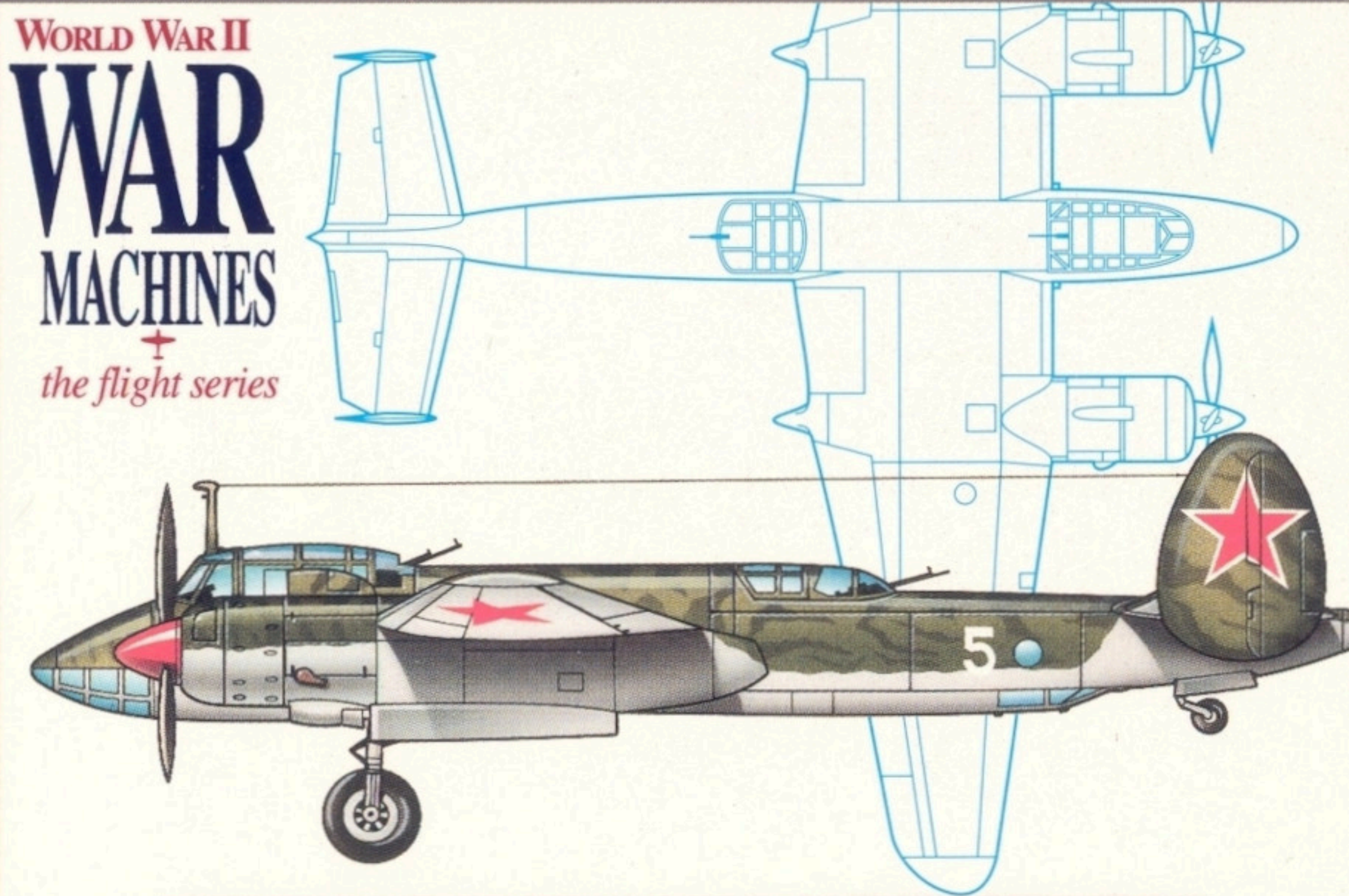
IL-4

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WAR
MACHINES
the flight series



PE-2

WORLD WAR II
WAR
MACHINES
the flight series



TU-2

WORLD WAR II
WAR
MACHINES
+
the flight series

46

Lavochkin
LaGG-3

First Printing
RG
the richards group, inc.

A contemporary of the MiGs, the LaGG-3 was also produced in large numbers. However, while the MiG was constructed of both metal and wood, the LaGG-3 was entirely made of wood, including the skin which was plywood. Like most early war Soviet fighters, the LaGG-3 possessed mediocre combat characteristics. It was only the great numbers of such aircraft and the determination of pilots defending their homeland that enabled the Soviets to survive until more advance aircraft were available. This LaGG-3 in the summer colors of an unknown unit represents all those that fought in the desperate air battles of 1941 and 1942.

Performance:

Maximum 348 m.p.h. at 16,000 ft.

Range:

Approximately 400 miles.

Engine:

1,200 h.p. 12 cylinder liquid-cooled Klimov M-105P

Armament:

One 20 mm cannon and two 12.7 mm MGs, all in the nose

Dimensions:

Wing span 32 ft. 2 in., Length 29 ft. 1 in., Height 8 ft. 9 in.

Ceiling:

Approximately 30,000 ft.

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WAR
MACHINES
+
the flight series

47

Lavochkin
La-7

First Printing
RG
the richards group, inc.

The original LaGG-3 design evolved during the war, first into the radial engined La-5 and La-5FN, and then into the fine La-7. Like its two predecessors, the La-7 used a large radial engine, but offered better performance chiefly through fuselage streamlining and weight reduction. The La-7 became the choice aircraft of many of the Soviet Union's top aces, among them Kozhedub (62 kills). The La-7 became available in substantial numbers in 1944 and was generally considered to be on equal terms with later German fighters such as the Bf 109G-6 and Fw 190 A-8. The La-7 appeared in a variety of camouflage colors and this one carries standard summer colors.

Performance:

Maximum 422 m.p.h. at 21,000 ft

Range:

Approximately 390 miles

Engine:

1,850 h.p. 14 cylinder ASH-82 FN air-cooled radial

Armament:

Three 20 mm cannon and provision for 440 lbs. of bombs/rockets

Dimensions:

Wing span 32 ft. 2 in., Length 27 ft. 11 in., Height 9 ft. 3 in.

Ceiling:

Approximately 34,000 ft.

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WAR
MACHINES
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the flight series

48

Yakovlev
Yak-1

First Printing
RG
the richards group, inc.

Within the first 6 months of the war, the Soviet Union had three modern front line fighters - the MiG-3, LaGG-3 and the Yak-1. Most Soviet pilots considered the Yak-1 the best of the three. Constructed of fabric covered steel tube frames and wooden wings, Yaks proved to be light weight, very maneuverable and easy to service in the field. German pilots considered Yak-1s to be lightly armed and lacking sufficient power, however the basic design was sound and over 8,000 Yak-1s left the production lines before the end of 1943. Later Yak models brought production totals to an incredible 37,000 aircraft. The Yak-1 on this card carries a typical early war camouflage scheme and colors.

Performance:

Maximum 372 m.p.h. at 12,000 ft.

Range:

Approximately 550 miles

Engine:

1,240 h.p. 12 cylinder liquid-cooled Klimov M-105P

Armament:

One 20 mm cannon and one or two 12.7 mm MGs

Dimensions:

Wing span 32 ft. 9 in., Length 27 ft. 9 in., Height 8 ft. 6 in.

Ceiling:

Approximately 32,800 ft.

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the flight series

49

Yakovlev
Yak-3

First Printing
RG
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The Yak -3 evolved from efforts to improve the combat performance of the Yak-1. This was accomplished via a series of design modifications which included reducing weight and improving aerodynamics. A comparison of Yak-1 and Yak-3 profiles clearly reveals many of the modifications. The result was one of the best fighters of WWII. The first Yak-3s began combat operations in mid 1943. They proved to be especially effective at lower altitude where they had a tighter turning circle and better acceleration than Bf 109G-2s. Small, fast and very maneuverable, Yak-3s like that pictured, served until the end of the war taking a heavy toll of German air units.

Performance:

Maximum 404 m.p.h. at 16,000 ft.

Range:

Approximately 500 miles

Engine:

1,240 h.p. 12 cylinder liquid-cooled Klimov M-105PF-2

Armament:

One 20 mm cannon and two 12.7 mm MGs

Dimensions:

Wing span 30 ft. 2 in., Length 27 ft. 10 in., Height 7 ft. 11 in.

Ceiling:

Approximately 35,100 ft.

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WAR
MACHINES
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the flight series

50

Yakovlev
Yak-9

First Printing
RG
the richards group, inc.

Parallel with the development of "light" fighters, or pure interceptors like the Yak-1 and 3, Yakovlev designers created "heavy" fighters like the Yak-7 and 9. These multi-purpose fighters took on the fighter-bomber, long range bomber escort, and ground attack roles. Yak-9s first saw combat in late 1942 and became the most numerous Soviet fighter with no less than 15,000 being produced by war's end. It compared favorably with contemporary German fighters such as the Bf 109G-2 but in the end, it was the vast numbers of these aircraft rather than any qualitative differences that led to Soviet air supremacy on the Eastern front.

Performance:

Maximum 373 m.p.h. at 11,000 ft., later models 435 m.p.h.

Range:

Approximately 550 miles, long range versions 840 to 1,300 miles

Engine:

1,260 h.p. 12 cylinder liquid-cooled Klimov M-105PF-3

Armament:

One 20 mm cannon and two 12.7 mm MGs

Dimensions:

Wing span 32 ft. 10 in., Length 28 ft. 1 in., Height 8 ft.

Ceiling:

Approximately 35,000 ft.

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WORLD WAR II
WAR
MACHINES
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the flight series

51

Ilyushin
Il-2

First Printing
RG
the richards group, inc.

Together, the Il-2 (about 35,000 built) and the Pe-2 (about 11,000 built) accounted for the vast majority of Soviet WWII bomber production. This clearly under-scores Soviet emphasis on tactical bombing and ground support aircraft. The Il-2 was without doubt the best of its type in WWII and a decisive weapon on the Eastern front. It was used effectively against German infantry, transport and tanks. The armor-clad Il-2 was known as the "concrete bomber" to German fighter pilots who often reported that cannon shells and tracer rounds simply bounced off the cockpit area. Slogans like the one on this late model Il-2 (For the Fatherland) were common.

Performance:

Maximum 250-260 m.p.h. at 10,000 ft. with bomb load

Range:

Approximately 400 miles

Engines:

1,750 h.p. 12 cylinder liquid cooled Mikulin AM-38F

Armament:

Two 20 or 30 mm cannon, three 12.7 mm MGs, 1,000 to 2,500 lbs. of bombs

Dimensions:

Wing span 47 ft. 11 in., Length 38 ft. 2 in., Height 11 ft. 5 in.

Ceiling:

Approximately 19,000 ft.

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WAR
MACHINES
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the flight series

52

Ilyushin
Il-4

First Printing
RG
the richards group, inc.

Designed in the late 1930s, the Il-4 had already fought in the Russo-Finnish war when the Germans invaded in 1941. By that time, several thousand had been produced. The Il-4 was technically a medium bomber and the only mass produced Soviet aircraft to approximate the strategic bomber role played by the American B-17, or the British Lancaster. Il-4s bombed Berlin in the summer of 1941 and saw continuous action until 1945. By war's end, nearly 7,000 had been built. In comparison to other medium bombers, the Il-4 possessed weak defensive armament, was fairly slow, but did have good range.

Performance:

Maximum 255 m.p.h. at approximately 21,000 ft.

Range:

2,350 miles on some versions

Engines:

Two 1,000 h.p. 14 cylinder M-87A or M-88B air-cooled radials

Armament:

Three 12.7 mm MGs and from 2,000 to 5,500 lbs. of bombs

Dimensions:

Wing span 70 ft. 4 in., Length 48 ft. 6 in., Height 13 ft. 8 in.

Ceiling:

Approximately 30,000 ft.

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MACHINES
+
the flight series

53

Petlyakov
Pe-2

First Printing
RG
the richards group, inc.

What began as a fast twin engined fighter developed into one of the most important tactical bombers of WWII. In 1941, only about 500 of these bombers were on hand by the end of the war, over 11,000 had been produced and the Pe-2 had supported ground forces all along the Eastern front. Between 1941 and 1945, the Pe-2 was up-graded continually to keep pace with German fighters. In addition to increases in performance and armament, this remarkable design shouldered additional roles including high altitude fighter and long range reconnaissance aircraft. The Pe-2 on this card is a late model light bomber equipped with a power rear turret.

Performance:

Maximum 335 m.p.h. (early) at 16,000 ft., later models - 405 m.p.h.

Range:

Approximately 750 miles

Engines:

Two 1,100 h.p. (early), or 1,600 h.p. (late) 12 cylinder liquid-cooled Klimov M-105Rs/VK-107As

Armament:

Two 12.7 mm MGs (turret, ventral rear), two 7.6 mm MGs (nose) and 2000 to 6,500 lbs. of bombs

Dimensions:

Wing span 56 ft. 3 in., Length 41 ft. 4 in., Height 11 ft. 5 in.

Ceiling:

Approximately 35,000 ft.

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the flight series

54

Tupolev
Tu-2

First Printing
RG
the richards group, inc.

The Tu-2, like most WWII era Soviet aircraft, was designed in the late 1930s. This all metal light/tactical bomber was originally intended to replace the Pe-2 and entered production during 1942. Although it had greater range, could carry heavier bomb loads, and used less vulnerable air-cooled radial engines, the Tu-2 supplemented rather than replaced the Pe-2. In 1942 the Soviet Union could not afford to put a premium on quality. Tu-2s were liked by their crews, performed well during the war and went on to serve with other nations up to the early 1960s. This aircraft flew with a unit on the Kalininsk sector of the front in 1942/43.

Performance:

Maximum 345 m.p.h. at 17,700 ft.

Range:

Approximately 1,550 miles

Engines:

Two 1,850 h.p. 14 cylinder Shvetsov ASH-82FN air-cooled radials:

Armament:

Three 12.7 mm MGs, two wing mounted 20 mm cannon, and 2,200 lbs. of bombs

Dimensions:

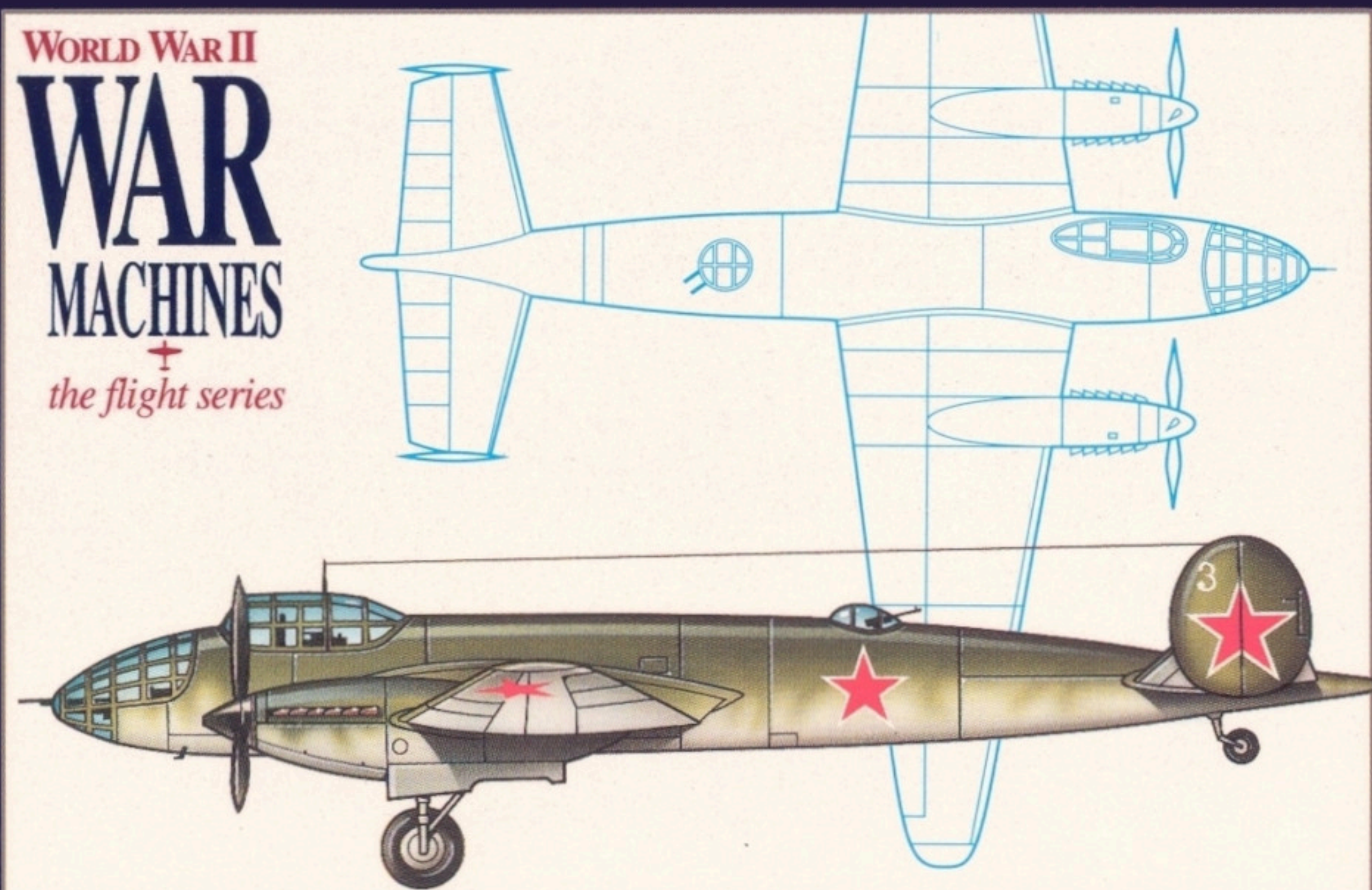
Wing span 61 ft. 10 in., Length 45 ft. 4 in., Height 13 ft. 9 in.

Ceiling:

Approximately 31,000 ft.

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+
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YER-2

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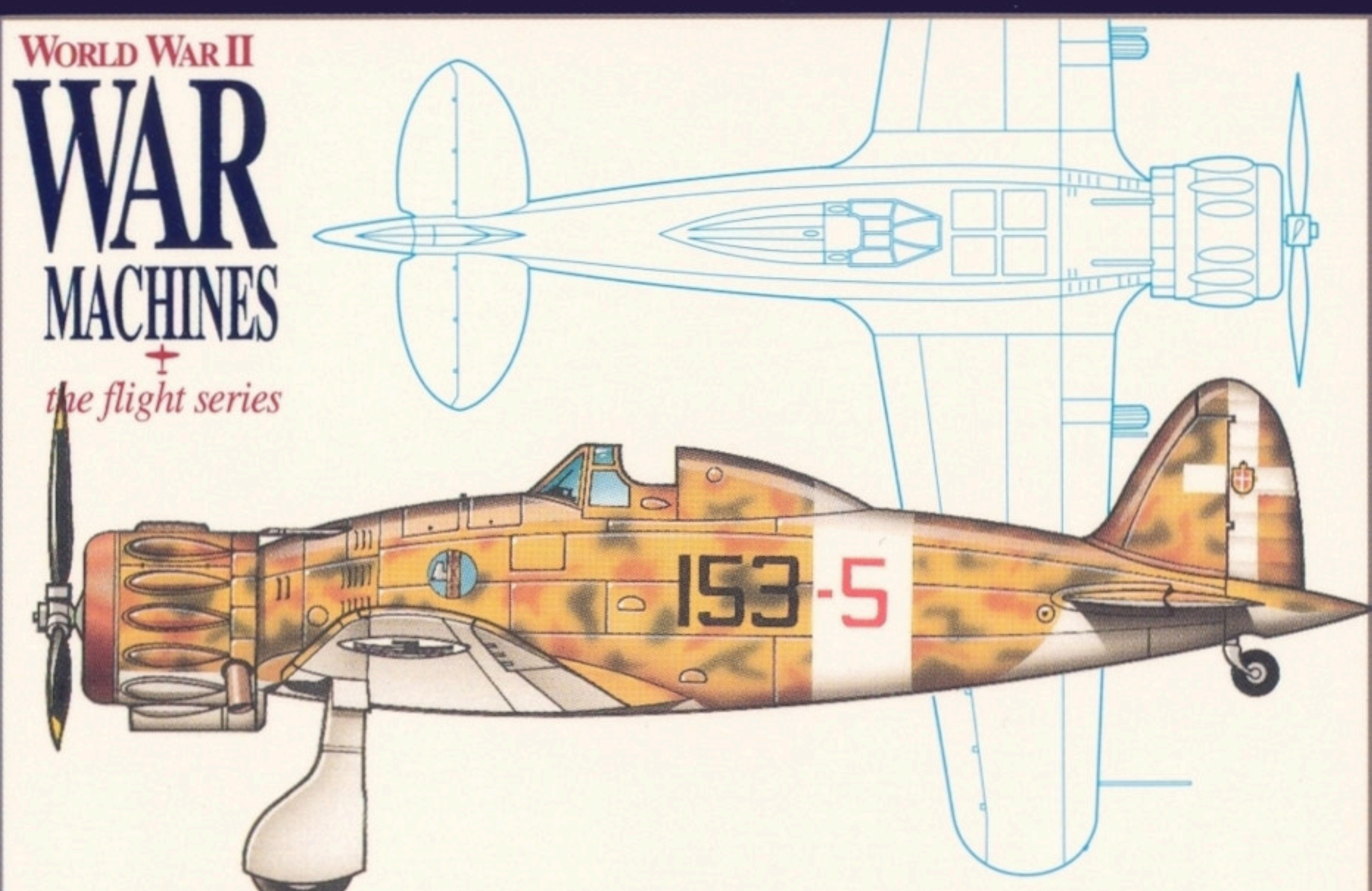
S.M. 79-II SPARVIERO

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WAR
MACHINES
+
the flight series



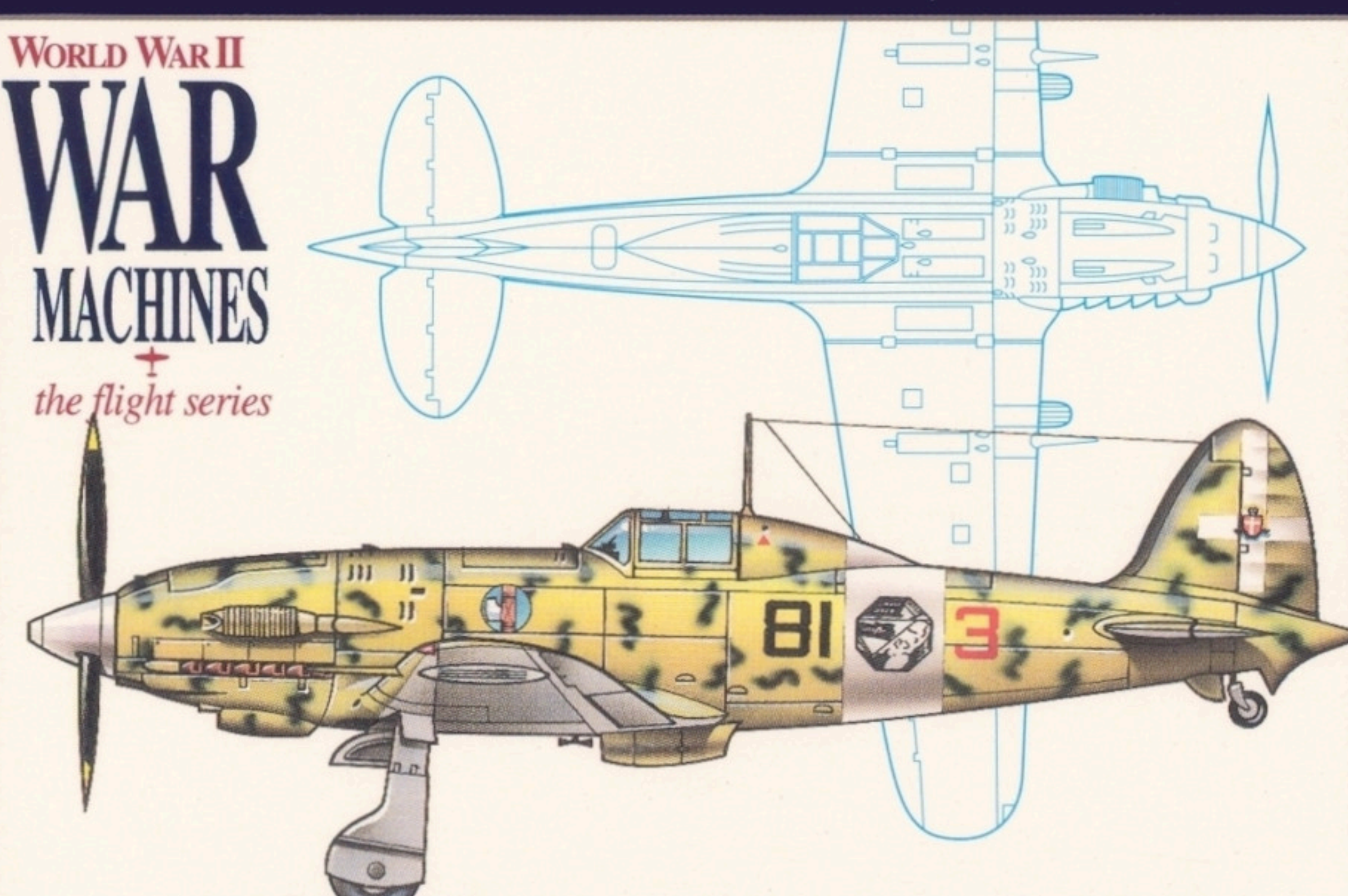
CANT Z.1007 ALCIONE

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WAR
MACHINES
+
the flight series



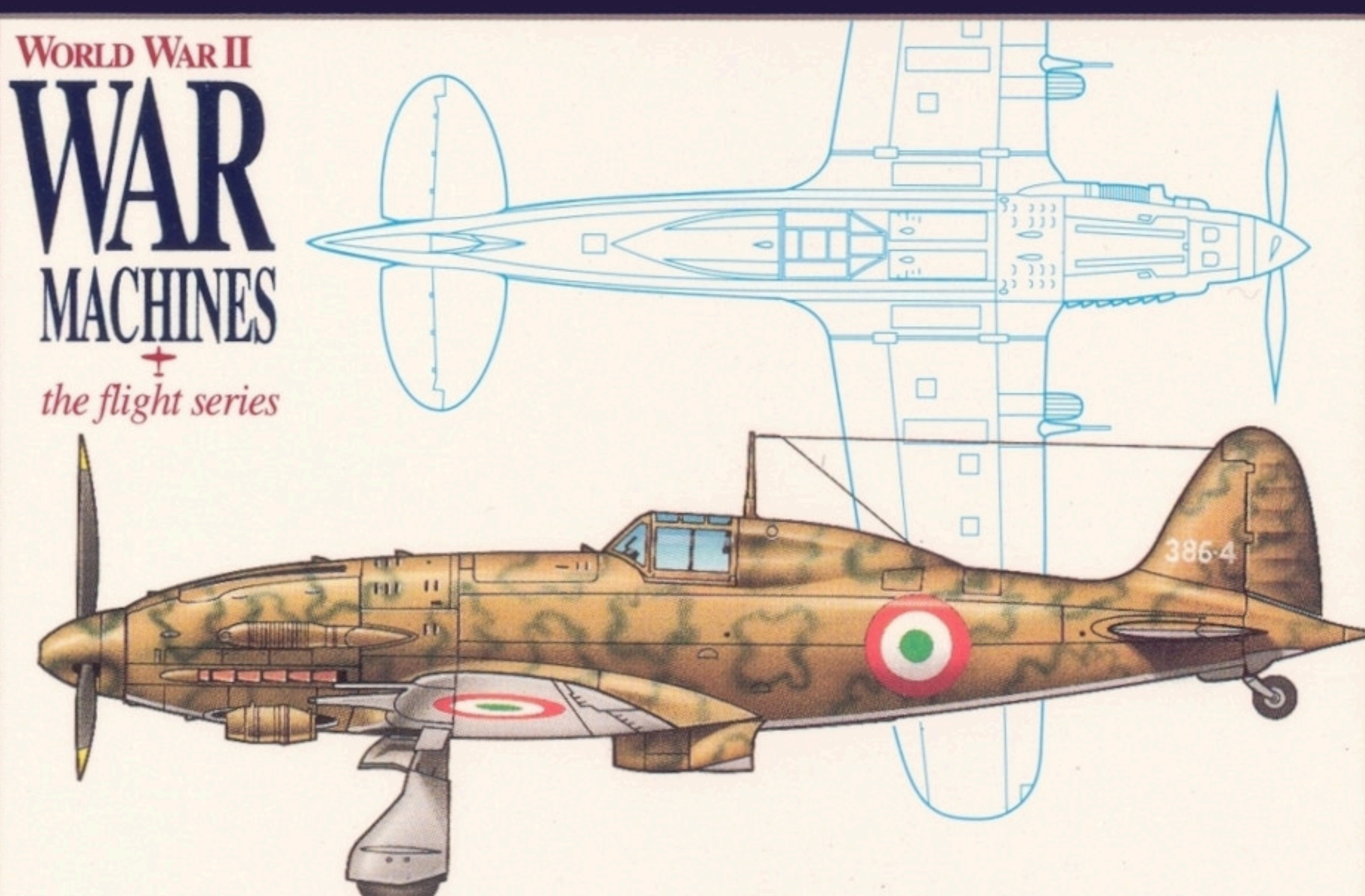
M.C.200 SAETTA

WORLD WAR II
WAR
MACHINES
+
the flight series



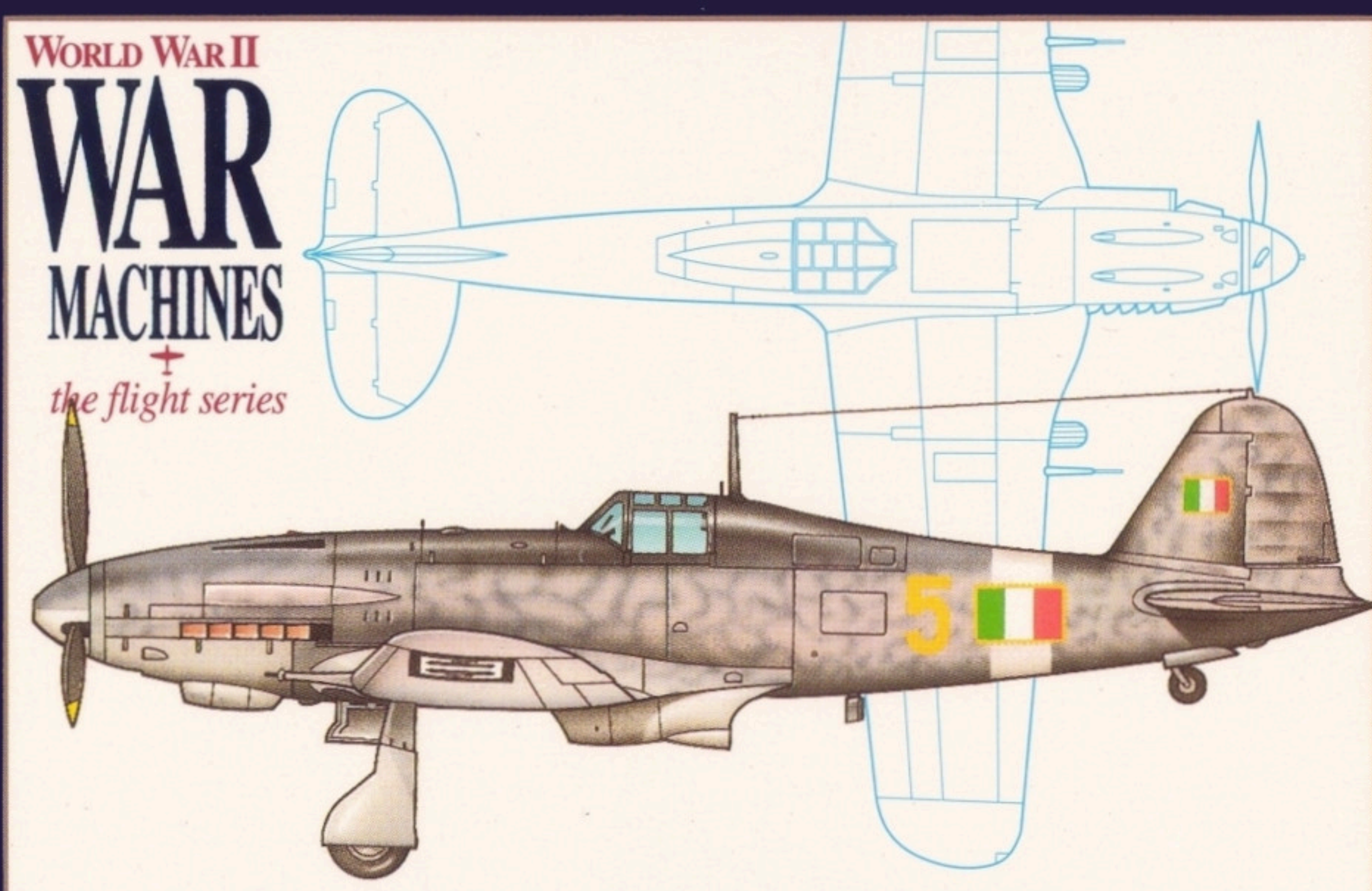
M.C.202 FOLGORE

WORLD WAR II
WAR
MACHINES
+
the flight series



M.C. 205 VELTRO

WORLD WAR II
WAR
MACHINES
+
the flight series



G.55 CENTAURO

WORLD WAR II
WAR
MACHINES
+
the flight series



Ki-43 HAYABUSA

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Ki-44Ia SHOKI

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55

**Yermolayev
Yer-2**

First Printing
RG
the richards group, inc.

Designed as a replacement for the Ilyushin Il-4, this all metal twin-engined bomber was built in smaller numbers than the aircraft it was to replace. In repelling the German invasion, quantity took precedence over quality. There were two versions of this long-range inverted gull-wing design; one with liquid-cooled gasoline engines and one with diesel engines. The diesel-engined model sacrificed speed (260 m.p.h. max.) for range (3,105 miles maximum). Soviet long range bomb squadrons used both versions of the Yer-2 to attack targets in Germany. The Yer-2 on this card is the gasoline powered model serving with an unknown bomber unit in 1943.

Performance:

Maximum 311 m.p.h. at approximately 19,000 ft.

Range:

2,550 miles with 2,200 lb. load

Engines:

Two 1,600 h.p. 12 cylinder liquid-cooled M-105s

Armament:

Three 12.7 mm MGs and from 2,000 to 5,500 lbs. of bombs

Dimensions:

Wing span 70 ft. 4 in., Length 48 ft. 6 in., Height 13 ft. 8 in.

Ceiling:

Approximately 30,000 ft.

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**Savoia-
Marchetti
S.M.79-II
Sparviero**

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The Sparviero (Hawk) was one of 2 front-line medium-bombers to have three engines - both were Italian. Far from being sub-standard, as was alleged by its critics, the S.M.79 was one of the most effective land-based torpedo bombers of WWII. It was the main offensive weapon of the Regia Aeronautica, performing bombing, ground support, reconnaissance and transport duties in the Mediterranean, the Balkans, and North Africa. The Hawk exacted a toll on British Mediterranean shipping and the exploits of the torpedo bombing units were the stuff of legend in Italy. 1,217 S.M.79s were built and the Hawk pictured carries the colors and markings of 281st Squadriglia in 1941.

Performance:

Maximum 270 m.p.h. at 12,000 ft.

Range:

1,243 miles maximum

Engines:

Three 1,000 h.p. 14 cylinder Piaggio P.XI RC 40 air-cooled radials

Armament:

Three 12.7 mm and one or two 7.7 mm MGs and 2,700 lbs. of bombs or two torpedos

Dimensions:

Wing span 69 ft. 6 in., Length 53 ft. 2 in., Height 13 ft. 5 in.

Ceiling:

Approximately 22,000 ft.

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**CANT
Z.1007
Alcione**

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The Alcione (Kingfisher) was a mid-1930s design built entirely of wood. It also began its career as a seaplane and rolled off production lines in both single and twin tailed versions. Between its introduction during the Greek campaign in 1940 and the end of the war, slightly over 550 of these medium bombers were built. Alciones were used throughout the Mediterranean and played a key role in the Italian campaign against Malta. Over Malta, their wooden construction did not hold up well against British Hurricanes and Spitfires. This Alcione carries one of several different camouflage schemes employed during the war and displays the markings of 191st Squadriglia.

Performance:

Maximum 280 m.p.h. at 15,000 ft.

Range:

1,243 miles with most bomb loads

Engines:

Three 1,000 h.p. 14 cylinder Piaggio P.XI RC 40 air-cooled radials

Armament:

Two 12.7 mm MGs, one dorsal, one ventral and two 7.7 mm MGs and 2,000 to 4,410 lbs. of bombs

Dimensions:

Wing span 81 ft. 4 in., Length 61 ft., Height 17 ft. 1 in.

Ceiling:

Approximately 25,500 ft.

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**Macchi
M.C.200
Saetta**

First Printing
RG
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When Italy entered the war in 1940, this mid-1930s design was one of the most modern fighters to equip the Regia Aeronautica. Despite its rather ungainly appearance and obsolescent open cockpit, the Macchi 200 was very maneuverable, fairly quick, and effective against most early war Allied fighters, including the RAF Hurricane. Macchi 200s were used on all fronts on which the Regia Aeronautica fought, including the Russian front, where for 15 losses they scored 88 kills against early Soviet fighter types. Slightly over 1,100 Macchi 200s were built and this card displays one in the early war camouflage of the 153rd Squadriglia.

Performance:

315 m.p.h. at 16,000 ft.

Range:

354 miles

Engines:

870 h.p. 14 cylinder Fiat A.74 air-cooled radial

Armament:

Two 12.7 mm. MGs, two 7.7 mm. MGs in wings (later models) and two 350 lb. bombs

Dimensions:

Wing span 34 ft. 8 in., Length 26 ft. 10 in., Height 11 ft. 6 in.

Ceiling:

Approximately 29,200 ft.

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**Macchi
M.C.202
Folgore**

First Printing
RG
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By mid-1941 Italy was able to introduce a truly first class front line fighter - the Macchi 202. It evolved from the earlier Macchi 200 when the 200's airframe was mated with a German liquid-cooled Daimler-Benz engine. The resulting machine was a shock to RAF Hurricanes flying over Malta and to P-40s in use with the British in North Africa. Macchi 202s were also fairly evenly matched against the earlier Spitfires when they began to appear in the skies over North Africa and Malta in 1942. The Macchi 202 depicted on this card - one of about 1,500 built - displays Desert camouflage and the markings of the 81st Squadriglia, 6th Gruppo, in North Africa in late 1942.

Performance:

372 m.p.h. at 18,000 ft.

Range:

475 miles without drop tanks

Engine:

1,175 h.p. 12 cylinder liquid-cooled Daimler-Benz 601A-1

Armament:

Two 12.7 mm. MGs above engine cowlings, two 7.7 mm. MGs in wings and two 350 lb. bombs

Dimensions:

Wing span 34 ft. 8 in., Length 29 ft. 1 in., Height 9 ft. 11 in.

Ceiling:

Approximately 37,000 ft.

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60

**Macchi
M.C.205
Veltro**

First Printing
RG
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When Italy surrendered to the Allies in September of 1943, the Macchi 205 had only been in service for a few months in very limited numbers. It matched the Macchi 202 air-frame to a more powerful engine and the resulting fighter could compete with the best Allied fighters. The 205 also introduced heavy armament, long a deficiency on Italian fighters. After Italian capitulation, elements of the Regia Aeronautica flew in support of the Allies. This included a small number of the 262 Macchi 205s produced. This Macchi 205 aircraft carries the colors and markings of the Co-belligerent Air Force, 386th Squadriglia, 21st Gruppo based in Lecce, Southern Italy, in mid-1944.

Performance:

400 m.p.h. at 24,000 ft.

Range:

646 miles without drop tanks

Engine:

1,475 h.p. 12 cylinder liquid-cooled Daimler-Benz 605A-1

Armament:

Two 12.7 mm. MGs, two 20 mm cannon and two 350 lb. bombs

Dimensions:

Wing span 34 ft. 8 in., Length 29 ft. 1 in., Height 9 ft. 11 in.

Ceiling:

Approximately 37,000 ft.

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61

**Fiat G.55
Centauro**

First Printing
RG
the richards group, inc.

Not to be outdone by rival Macchi, Fiat mated German DB605A engines to their own airframes. The resulting G.55 bore an uncanny resemblance to the Macchi 205 and deliveries began in 1943 just as Italy capitulated. With production facilities in Turin, northern Italy, nearly all 100+ G.55s built served with the Italy's Aeronautica Nazionale Repubblicana - the air arm which formed after capitulation to fight with Germany. In combat, the G.55 proved better than the Macchi 205, especially at high altitude, where it fought on equal terms with some of the best Allied fighters. Shown is a 2nd Squadriglia, 2nd Fighter Group aircraft in late 1944.

Performance:

385 m.p.h. at 24,300 ft.

Range:

1,025 miles without drop tanks

Engine:

1,475 h.p. 12 cylinder liquid-cooled Daimler-Benz 605A-1

Armament:

Two 12.7 mm. MGs and one 20 mm cannon in fuselage, two 20 mm cannon in wings,

Dimensions:

Wing span 38 ft. 10 in., Length 30 ft. 9 in., Height 10 ft. 3 in.

Ceiling:

Approximately 42,000 ft.

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62

**Nakajima
Ki-43
Hayabusa**

First Printing
RG
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When Japan entered WWII, the Ki-43 was the Japanese Army's most modern fighter and an unpleasant surprise to contemporary Allied fighters. Continually refined during the war, the Ki-43 was still in production when Japan surrendered. Built for agility, the Ki-43 was light, lightly protected and inadequately armed. Later Allied fighters were faster, but none could match the high G dogfighting maneuvers of the Ki-43. Code named "Oscar" by the Allies, the Ki-43 was popular with pilots and was the aircraft-flown by most Japanese Army aces, including Shinohara (54 kills) and Anabuki (51 kills). 5,919 of these fighter were built, including this Chinese based Ki-43II.

Performance:

Maximum 325 m.p.h. at approximately 15,000 ft.

Range:

1,050 miles on internal fuel

Engine:

1,150 h.p. 14 cylinder Nakajima Ha-115 air-cooled radial

Armament:

Two 12.7 mm MGs and racks for two 550 lb. bomb

Dimensions:

Wing span 35 ft. 7 in., Length 29 ft. 3 in., Height 10 ft. 8 in.

Ceiling:

Approximately 36,700 ft.

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63

**Nakajima
Ki-44-Ia
Shoki**

First Printing
RG
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Whereas the Ki-43 had been intended as a dogfighter with good range and endurance, the Ki-44 was designed to intercept Allied bombers over cities and other strategic sites. This role required a rapid climb rate and high speed, but limited range. Introduced in mid-1942, it defended oil facilities in Sumatra as well as cities in Japan, China and S.E. Asia. The Ki-44, code named "Tojo" by the Allies, packed a large radial engine into a small, short-winged air-frame. It proved effective against US B-29s over Japan, but was also difficult to handle. Only about 1,200 were produced. The Ki-44 illustrated here carries the colors of the 2nd Chutai, 85th Fighter Sentai, Nanking China, 1942.

Performance:

Maximum 360 m.p.h. at approximately 12,150 ft.

Range:

570 miles on internal fuel

Engine:

1,260 h.p. 14 cylinder Nakajima Ha-41 air-cooled radial

Armament:

Two 12.7 mm and two 7.7 mm MGs

Dimensions:

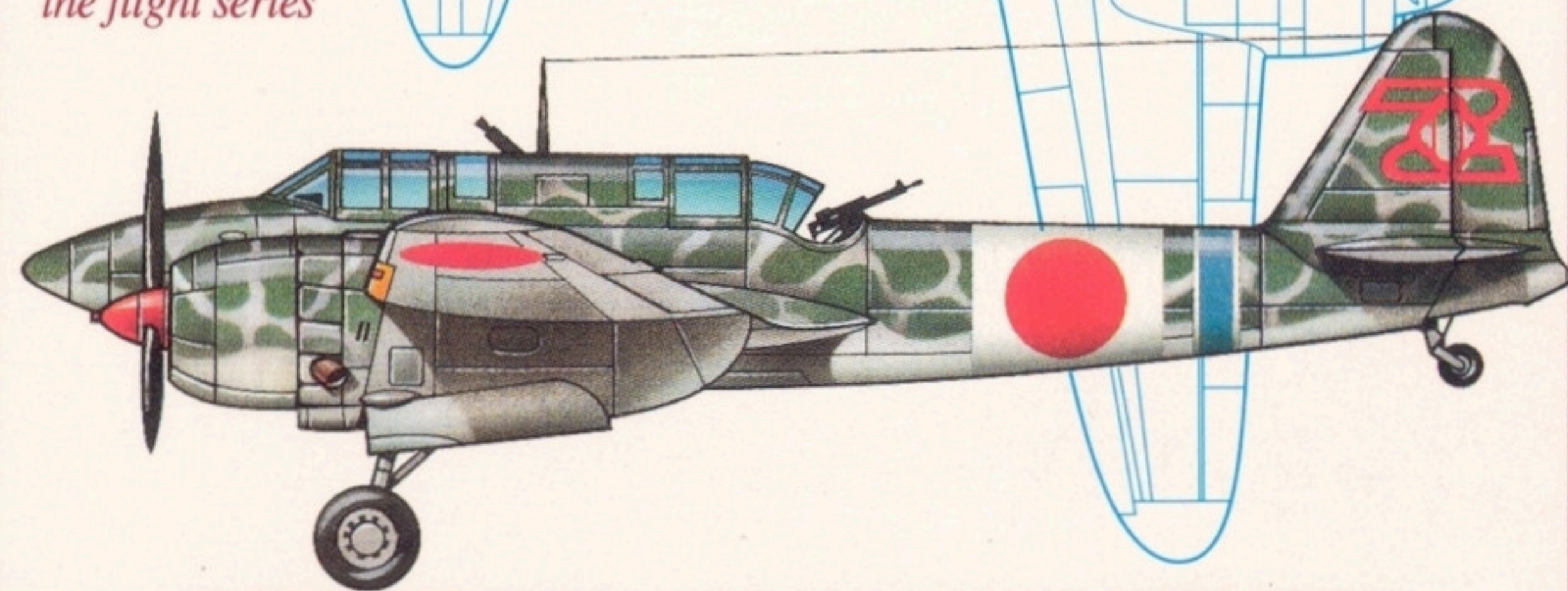
Wing span 31 ft., Length 28 ft. 8 in., Height 10 ft. 8 in.

Ceiling:

Approximately 36,700 ft.

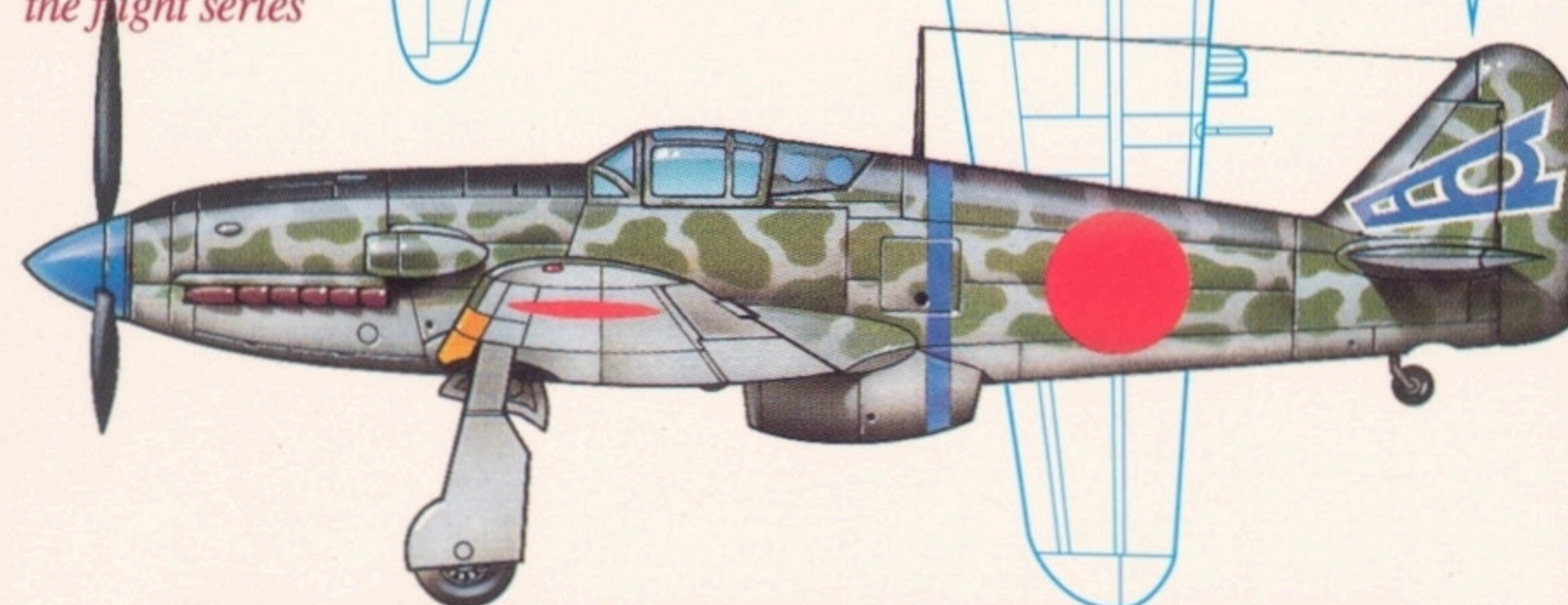
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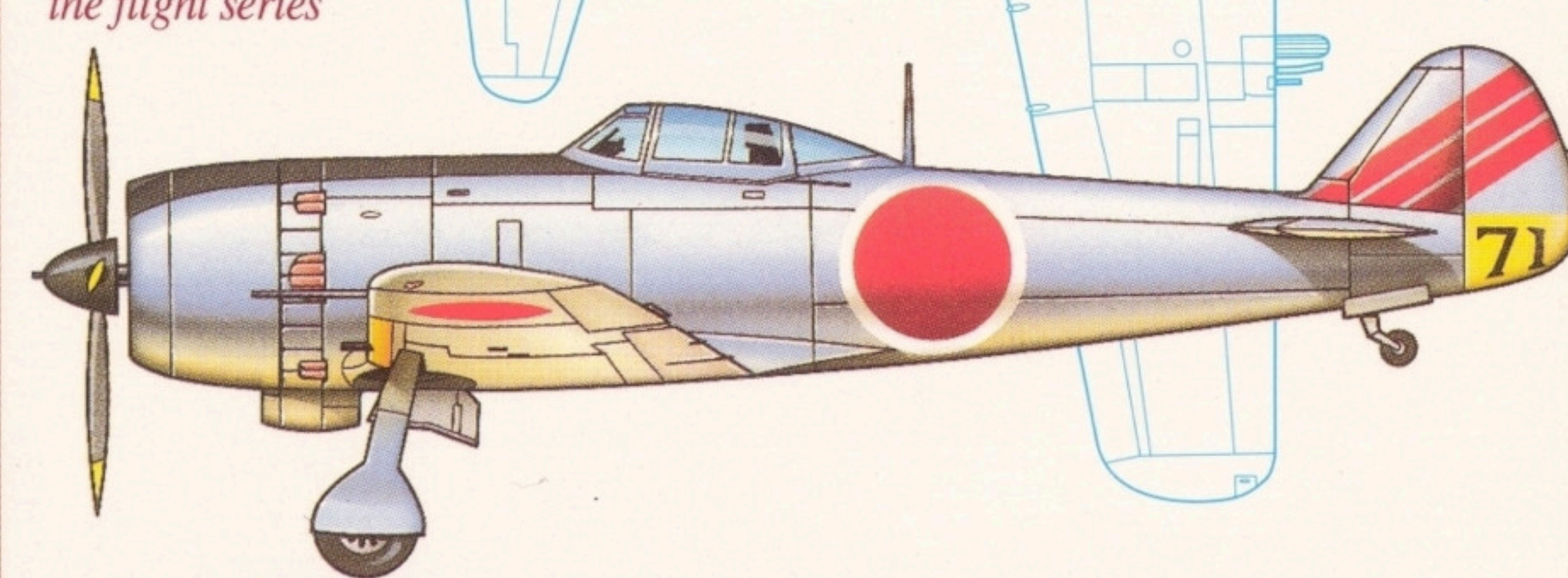
Ki-45-Kai-C TORYU

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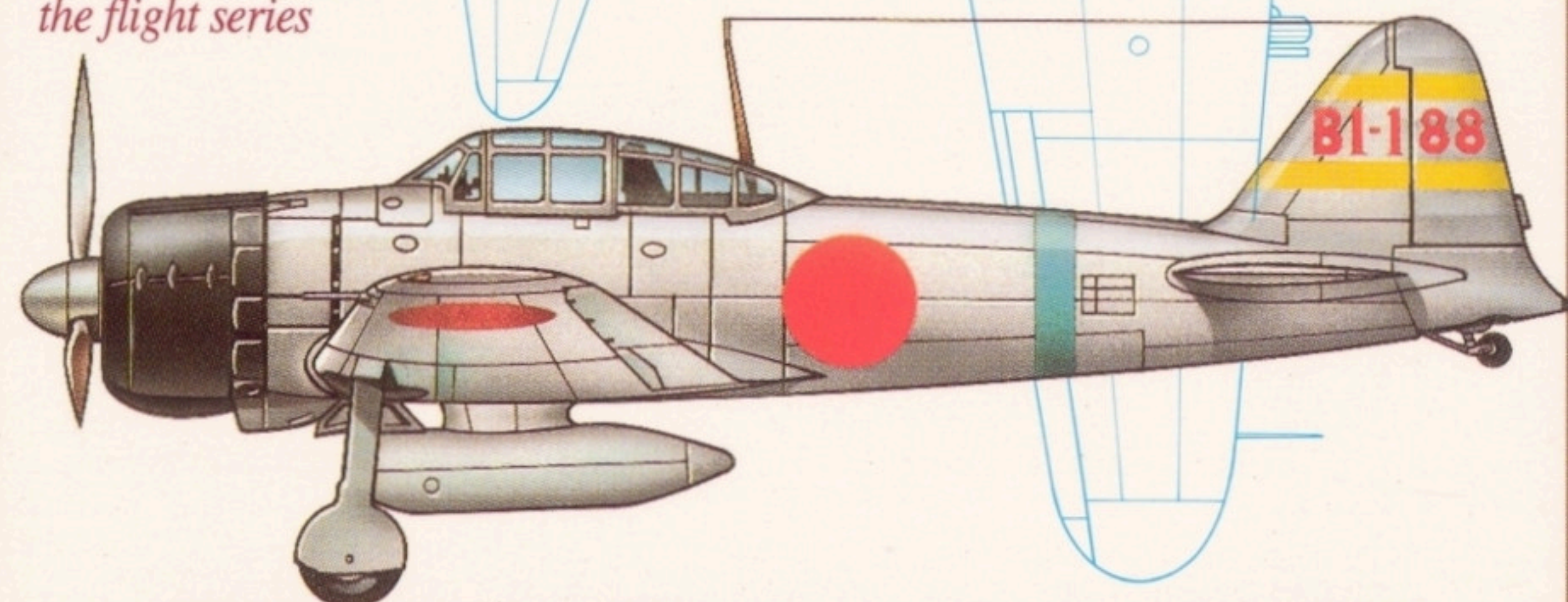
Ki-61-Ia HIEN

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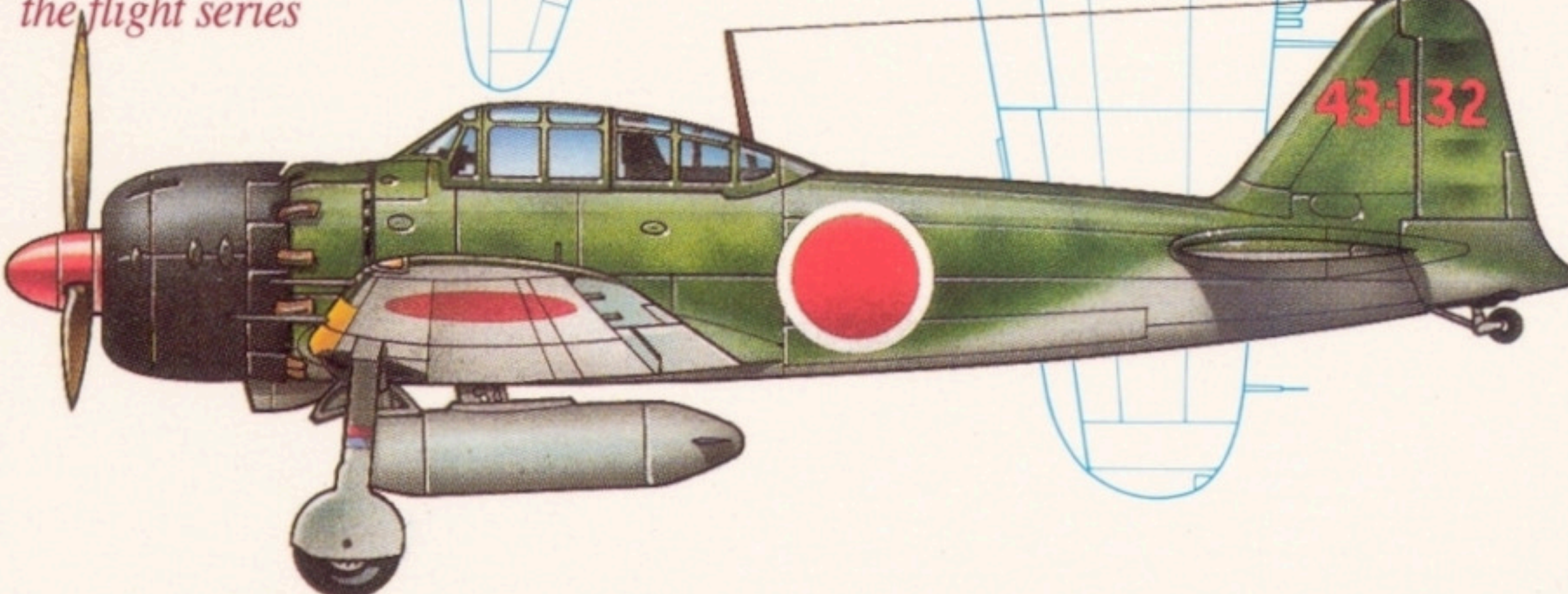
Ki-84 HAYATE

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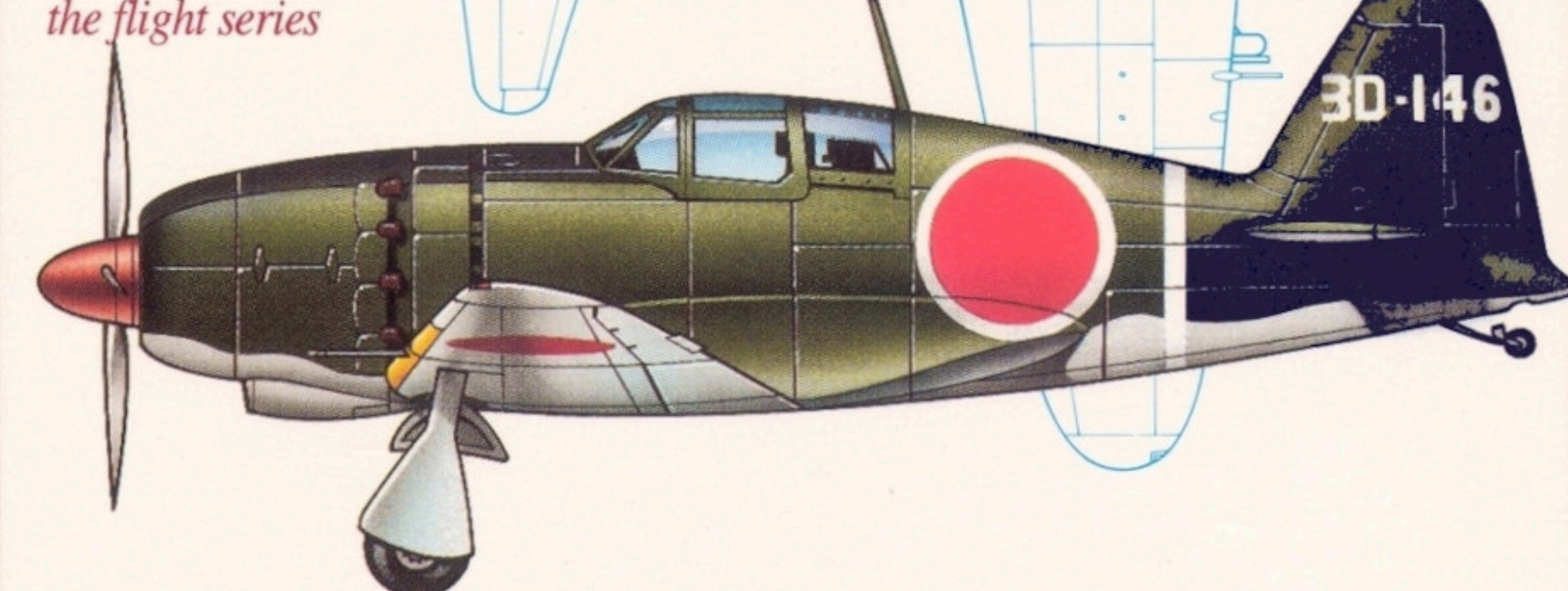
A6M2 ZERO-SEN

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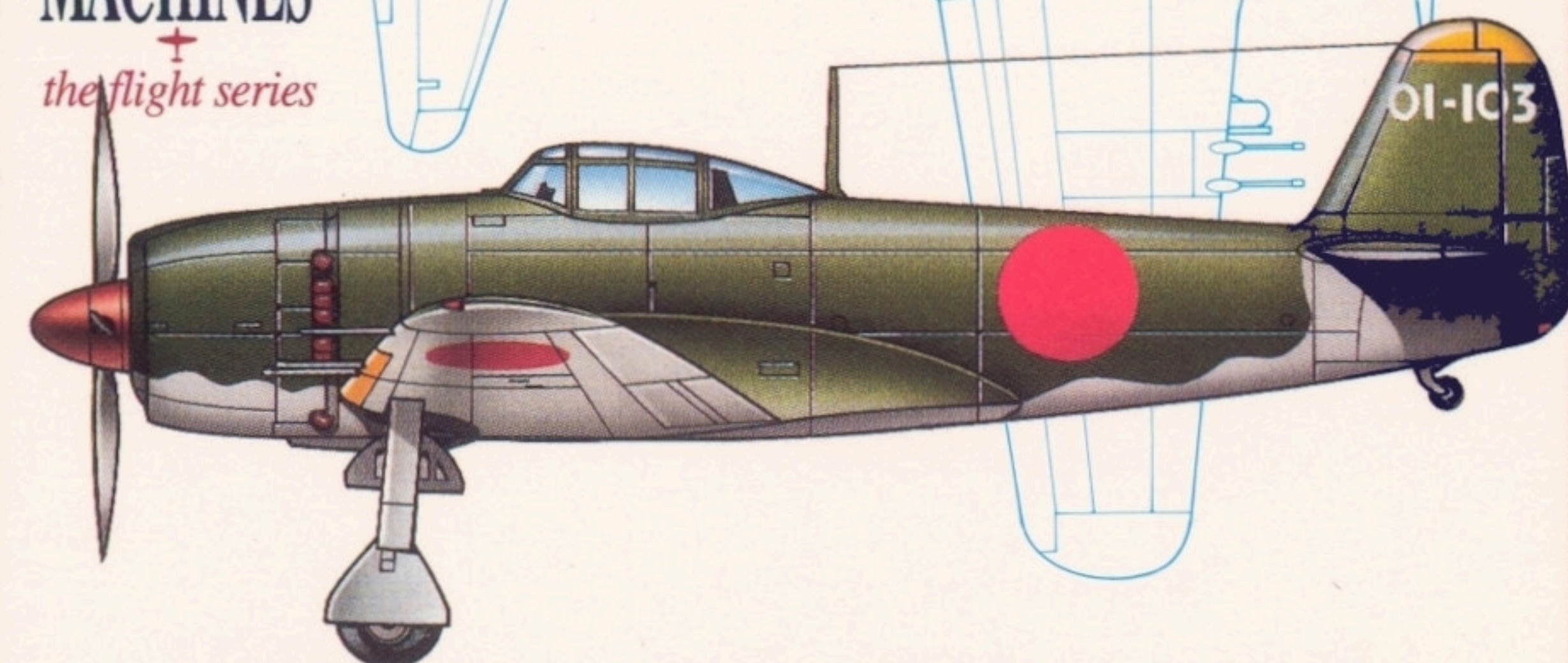
A6M5 ZERO-SEN

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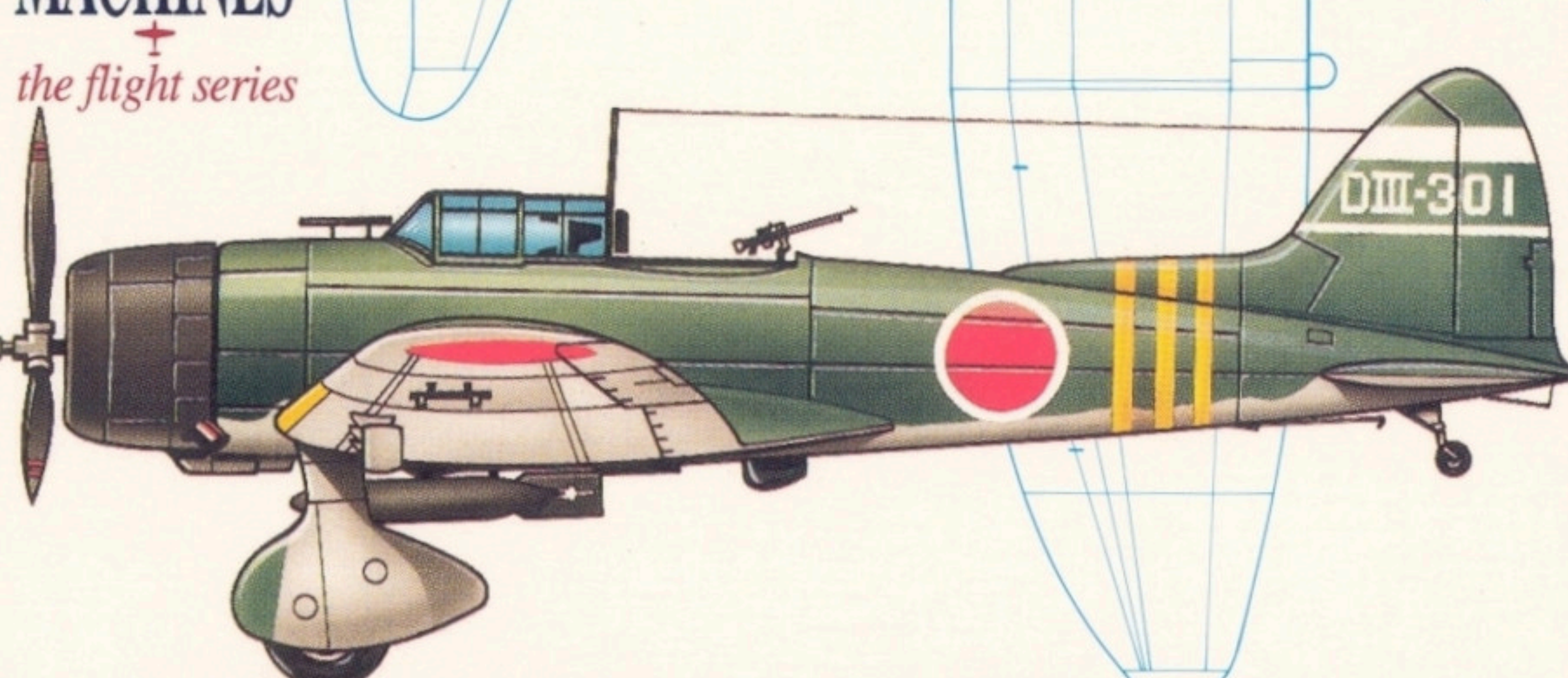
J2M RAIDEN

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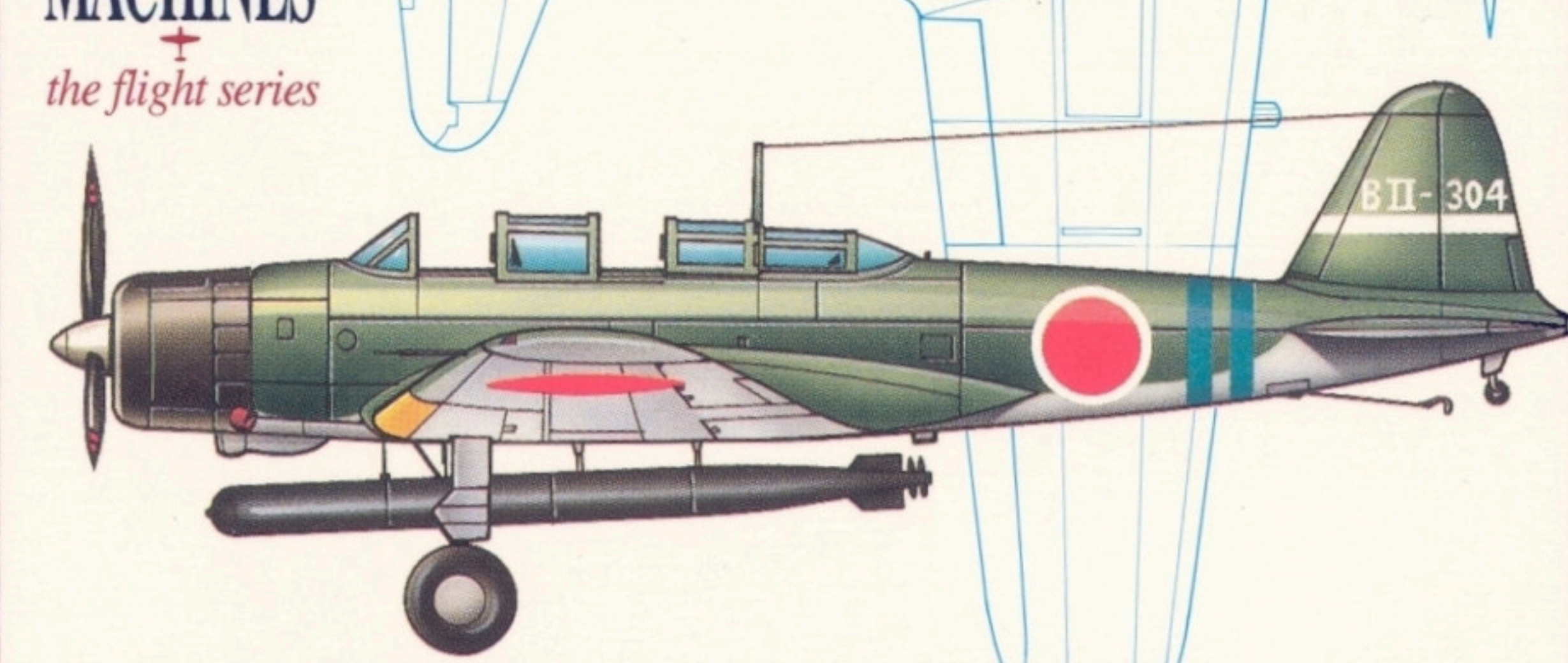
N1K2-J SHIDEN

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D3A1

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WAR
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B5N2

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64

**Kawasaki
Ki-45-Kia-C
Toryu**

First Printing
RG
the richards group, inc.

Originally conceived as the Japanese Army's first twin engined escort fighter, the Ki-45 rarely performed that role. Instead, it proved to be an effective bomber interceptor. Heavily armed and with good speed, it was used against B-24s in the South Pacific, and later against B-29s over the home islands. The last version was a radar equipped night fighter with formidable armament - a forward firing 37mm cannon and upward firing twin 20 mm cannon. The upward firing cannon were particularly effective on the undersides of B-29s. Code named "Nick", only about 1,700 were built. This one served in defense of the home islands in 1945.

Performance:

Maximum 336 m.p.h. at approximately 19,600 ft.

Range:

Maximum about 1,000 miles

Engines:

Two 1,080 h.p. 14 cylinder liquid-cooled Kawasaki Ha-102

Armament:

One 37 mm cannon in fuselage, two 20 mm cannon

Dimensions:

Wing span 49 ft. 3 in., Length 36 ft. 1 in., Height 12 ft. 2 in.

Ceiling:

Approximately 32,800 ft.

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**Kawasaki
Ki-61-Ia
Hien**

First Printing
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Among Japanese fighters, the Ki-61 was unique in having a liquid-cooled engine. The engine was a license built German DB601A - the same engine series used in the Bf109. In fact, for a time, the Ki-61 was thought to be Japanese built Bf 109. After its 1943 introduction in New Guinea, the Allies encountered the Ki-61 - code named "Tony" - in all areas of the Pacific. Used as an interceptor and bomber escort, this otherwise fine aircraft had one major weakness - a maintenance intensive, unreliable engine. Slightly over 3,000 were produced. Pictured here is a Ki-61 in the colors and markings of the 68th Fighter Sentai, HQ Chutai, New Guinea, 1945.

Performance:

Maximum 348 m.p.h. at approximately 16,000 ft.

Range:

Maximum 1,000 miles

Engine:

1,175 h.p. 12 cylinder liquid-cooled Kawasaki Ha-40

Armament:

Two 20 mm cannon in wings and two 7.7 mm MGs in nose

Dimensions:

Wing span 39 ft. 4 in., Length 29 ft. 4 in., Height 12 ft. 1 in.

Ceiling:

Approximately 32,800 ft.

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**Nakajima
Ki-84
Hayate**

First Printing
RG
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The Ki-84 is regarded as one of the best aircraft produced by the Japanese during WWII. Developed during 1943, Army fighter units began receiving Ki-84s in the Spring of 1944. In overall performance, it proved the equal of contemporary US fighters, including the P-51 and Hellcat. In agility it was superior, capable of turning inside either. In contrast to earlier Japanese designs, it did not sacrifice armor, especially pilot protection, for agility. This versatile aircraft served as both a fighter and fighter-bomber in China, the Philippines and Japan. Code named "Frank" by the Allies, over 3,500 were built, including this Philippines based Ki-84 of the 1st Chutai, 73rd Sentai.

Performance:

Maximum 390 m.p.h. at approximately 20,000 ft.

Range:

1,025 miles on internal fuel

Engine:

1,900 h.p. 18 cylinder Nakajima Ha-45 air-cooled radial

Armament:

Two 20 mm cannon in wings, two 12.7 mm MGs in nose

Dimensions:

Wing span 36 ft. 11 in., Length 32 ft. 7 in., Height 11 ft. 1 in.

Ceiling:

Approximately 34,450 ft.

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67

**Mitsubishi
A6M2
Zero-Sen**

First Printing
RG
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If one fighter epitomizes Japanese efforts in the field of WWII aviation, it is without doubt the Zero. Put into production in 1940 and tested in China, there were over 400 of these fine fighters available by December of 1941. Light and extremely agile, this fighter swept away all Allied air opposition in the first two years of the war. No Allied fighter could turn with a Zero and its range enabled the Japanese to control vast amounts of Pacific air space. It achieved this level of performance, in part by eliminating as much weight as possible - including protective armor. This A6M2 Model 21 displays markings that place it with the 2nd Carrier Division, on the carrier Soryu in early 1942.

Performance:

Maximum 316 m.p.h. at approximately 16,500 ft.

Range:

1,940 miles with drop tank

Engine:

925 h.p. 14 cylinder Nakajima Sakae 12 air-cooled radial

Armament:

Two 20 mm cannon and two 7.7 mm MGs

Dimensions:

Wing span 39 ft. 4 in., Length 29 ft. 9 in., Height 9 ft. 7 in.

Ceiling:

Approximately 33,790 ft.

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**Mitsubishi
A6M5
Zero-Sen**

First Printing
RG
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With the appearance of the Corsair and Hellcat in 1943, the Zero began to lose its effectiveness. The Japanese responded with a heavier but faster Zero - the A6M5 Model 52 (Allied code name Zeke 52). The Model 52 became operational in mid-1943 and was built in greater numbers than any other A6M. It was roughly a match for the Hellcat. The four top-scoring Japanese aces were all Navy Zero pilots - Iwamoto (94 kills), Nishazawa (87), Sugita (70) and Sakai (64). With almost 11,000 built, the Zero became the most produced Japanese aircraft of WWII. This Model 52 carries the markings of the 343rd Naval Air Group, Battle of the Philippine Sea, June 1944.

Performance:

Maximum 351 m.p.h. at approximately 19,685 ft.

Range:

1,170 miles with drop tank

Engine:

1,130 h.p. 14 cylinder Nakajima Sakae 12 air-cooled radial

Armament:

Two 20 mm cannon and two 7.7 mm MGs

Dimensions:

Wing span 36 ft. 1 in., Length 29 ft. 11 in., Height 9 ft. 8 in.

Ceiling:

Approximately 37,500 ft.

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**Mitsubishi
J2M
Raiden**

First Printing
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For the Japanese Navy, the Raiden represented a departure from previous fighters because it emphasized climb rate and speed rather than dogfighting ability. The first version of the J2M flew in early 1942 and after some modifications, was introduced into service in late 1943. The Raiden, code named "Jack", was used like the Army's Ki-44 as a point interceptor and almost exclusively in defending the Japanese home islands. It was encountered by US B-29s and was one of most effective interceptors put up against the giant bombers. Production of the Raiden was slowed in favor of the N1K2 Shiden and only about 500 were ever built. This one served with the 302nd Naval Air Group in 1945.

Performance:

Maximum 380 m.p.h. at 20,000 ft.

Range:

Approximately 650 miles

Engine:

1,820 h.p. 14 cylinder Mitsubishi MK4R Kasei air-cooled radial

Armament:

Four 20 mm cannon

Dimensions:

Wing span 35 ft. 5 in., Length 31 ft. 9 in., Height 12 ft. 6 in.

Ceiling:

37,750 ft.

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**Kawanishi
N1K2-J
Shiden**

First Printing
RG
the richards group, inc.

While a successful floatplane was derived from the Zero, the Shiden was unique in having been developed from a float-plane. The Kawanishi Kyofu was a formidable float-plane fighter which entered service in 1943. While the Kyofu was being developed, a land based airframe was devised from it. Some design problems were worked out with the first model - the N1K1. The revised version - the N1K2 - was one of the best Japanese fighters of WWII. The "George", as the Allies called it, was the equal of the US Hellcat in all areas of performance. Only a little over 1,400 of these fine fighters were produced. This one carries the markings of the 1001st Naval Air Grp. in 1945.

Performance:

Maximum 369 m.p.h. at 18,370 ft.

Range:

1,069 miles

Engine:

1,990 h.p. 18 cylinder Nakajima Homare 21 air-cooled radial

Armament:

Four 20 mm cannon

Dimensions:

Wing span 39 ft. 3 in., Length 30 ft. 8 in., Height 13 ft.

Ceiling:

35,400 ft.

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**Aichi
D3A1**

First Printing
RG
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With fixed landing gear, the D3A1 gave the appearance of being an outdated machine. In truth, it entered service in 1940 and was an extremely effective weapon. Some sources credit it with sinking more Allied war ships than any other aircraft. The "Val", as it became known to the Allies, and the B5N "Kate" torpedo bomber formed the core of early war Japanese carrier strike groups. 129 of these dive bombers were involved in the raid on Pearl Harbor and in the next 2 years, D3As were involved in the sinking of the British carrier Hermes and the US carriers Yorktown and Hornet. This D3A1 carries markings that place it on the light carrier Ryujo in August of 1942.

Performance:

Maximum 242 m.p.h. at approximately 8,000 ft.

Range:

1,131 miles with full bomb load

Engine:

1,075 h.p. 14 cylinder Mitsubishi Kinsei-44 air-cooled radial

Armament:

Three 7.7 mm MGs (2 forward, 1 in rear) and 880 lb. bomb load

Dimensions:

Wing span 47 ft. 1 in., Length 33 ft. 5 in., Height 11 ft.

Ceiling:

Approximately 31,000 ft.

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72

**Nakajima
B5N2**

First Printing
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The B5N design first flew in 1937 and developed into one of the Japanese Navy's most effective weapons. Beginning its operational life as a light bomber, its real value was as a torpedo bomber. 40 torpedo carrying B5N2s participated in the Pearl Harbor raid. During the intense struggles at sea over the next 2 years, "Kates" were largely or completely credited with sinking the carriers *Hornet*, *Wasp*, *Lexington* and *Yorktown*. About 1,200 B5Ns were produced before they were withdrawn from front line service in 1944. The markings on this B5N identify it as belonging to the carrier Hiryu during the Pearl Harbor raid on December 7, 1941.

Performance:

Maximum 235 m.p.h. at 12,000 ft.

Range:

609 miles with torpedo

Engine:

1,115 h.p. 14 cylinder Nakajima Sakae 21 air-cooled radial

Armament:

Four 7.7 mm MGs, two forward, two in rear and one 1,764 lb. torpedo

Dimensions:

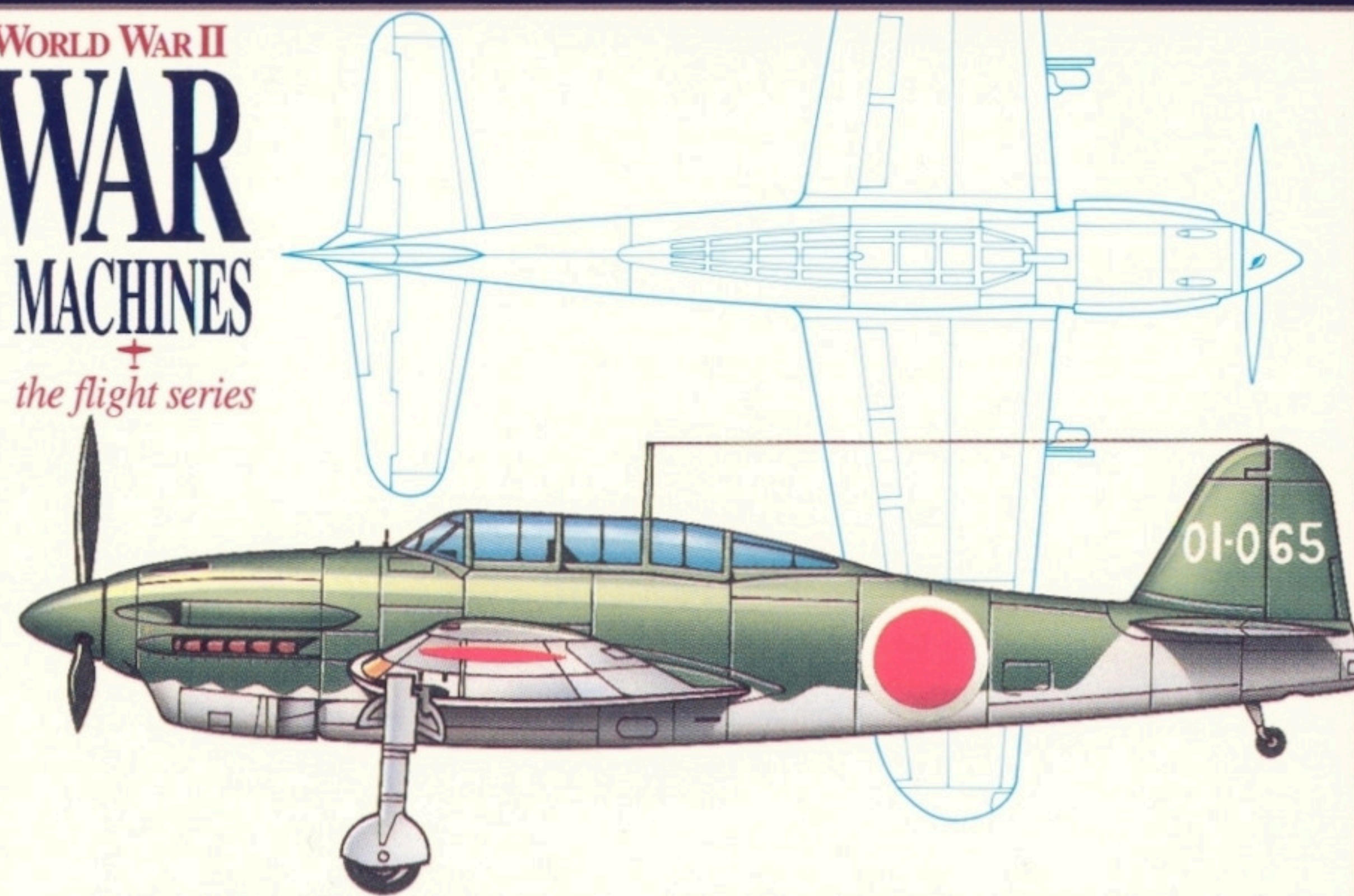
Wing span 50 ft. 11 in., Length 33 ft. 9 in., Height 12 ft. 1 in.

Ceiling:

Approximately 25,000 ft.

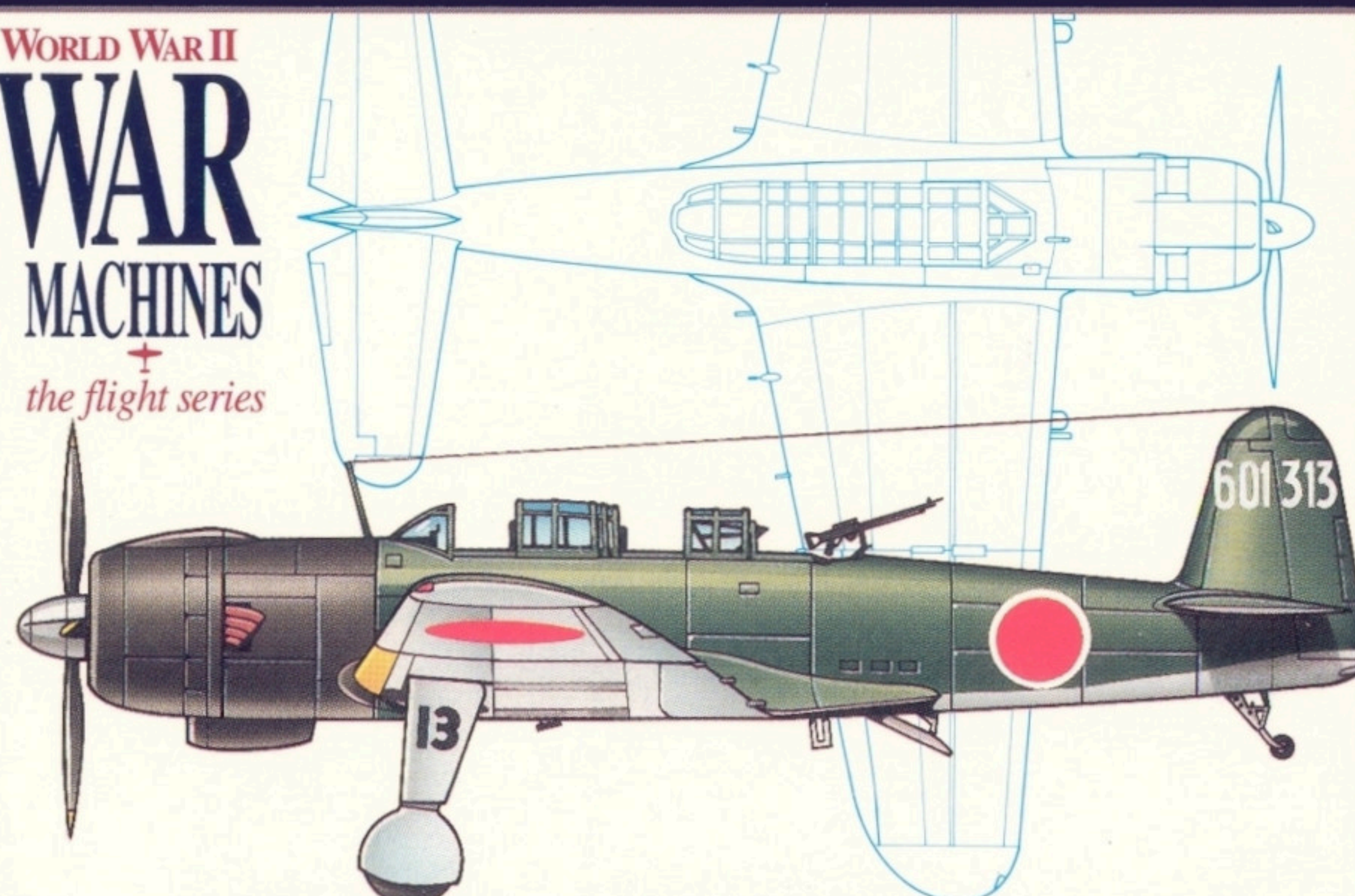
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D4Y1 SUISEI

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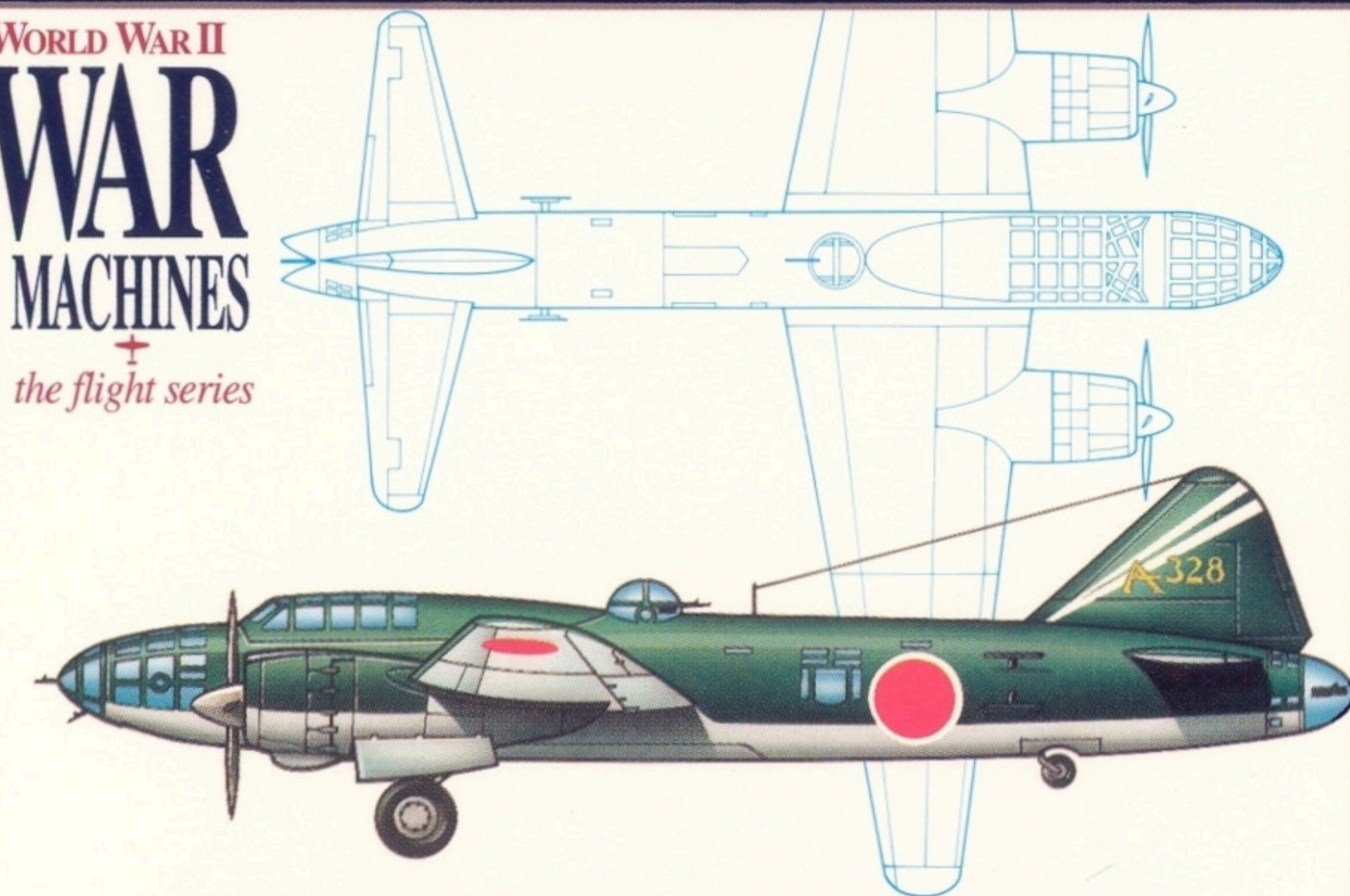
B6N2 TENZAN

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WAR
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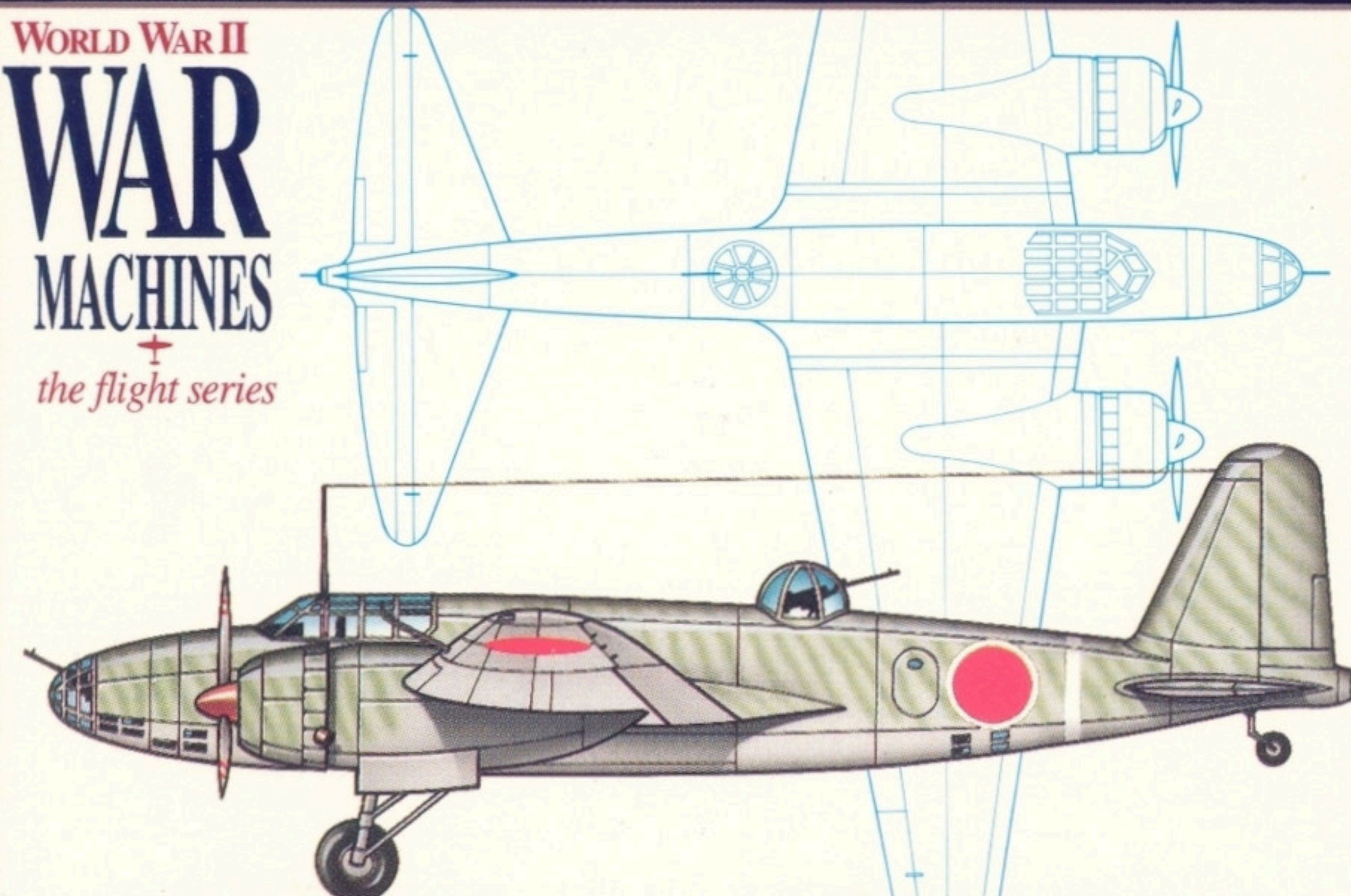
G3M2

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WAR
MACHINES
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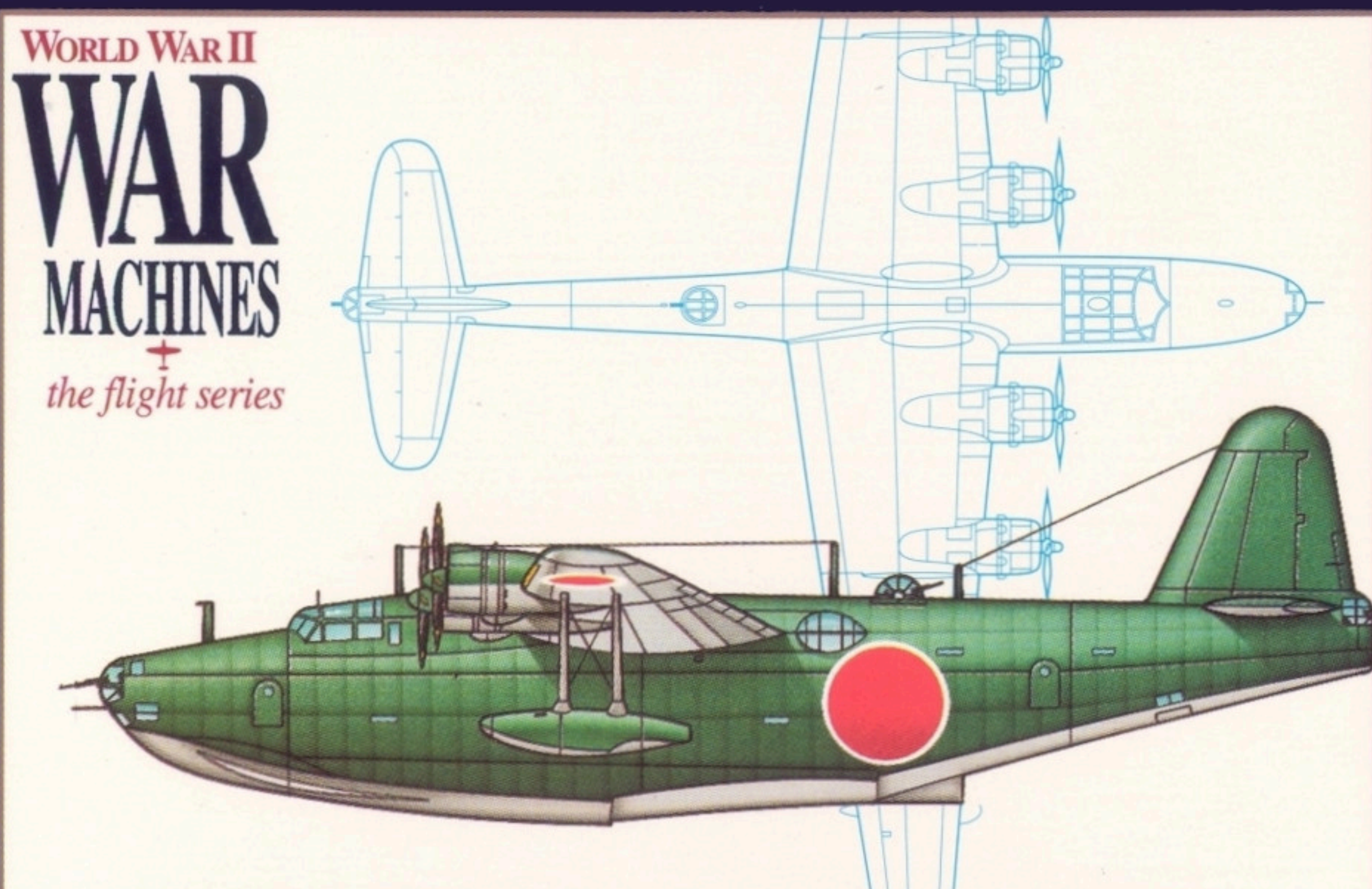
G4M2

WORLD WAR II
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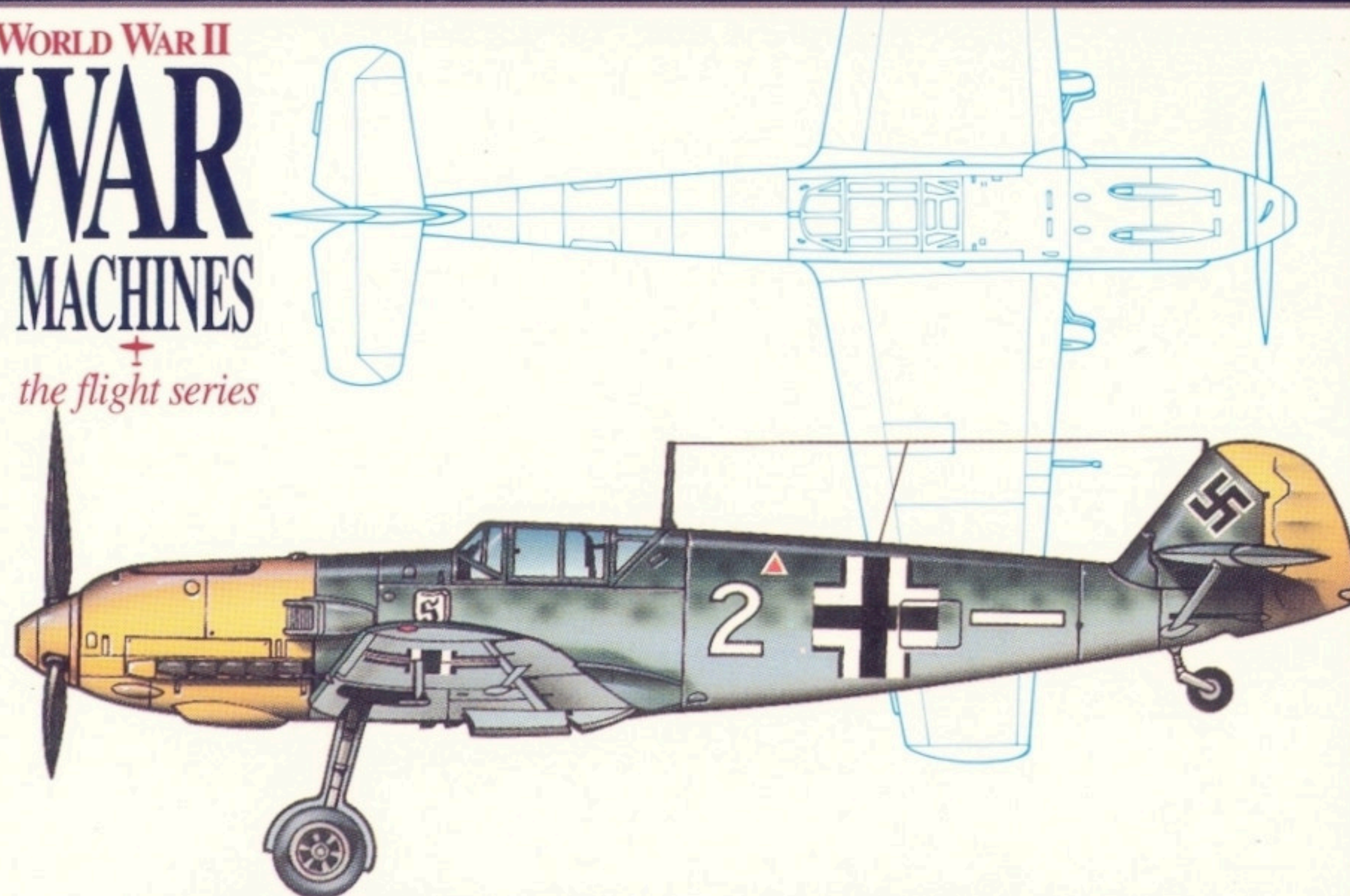
Ki-21-IIb

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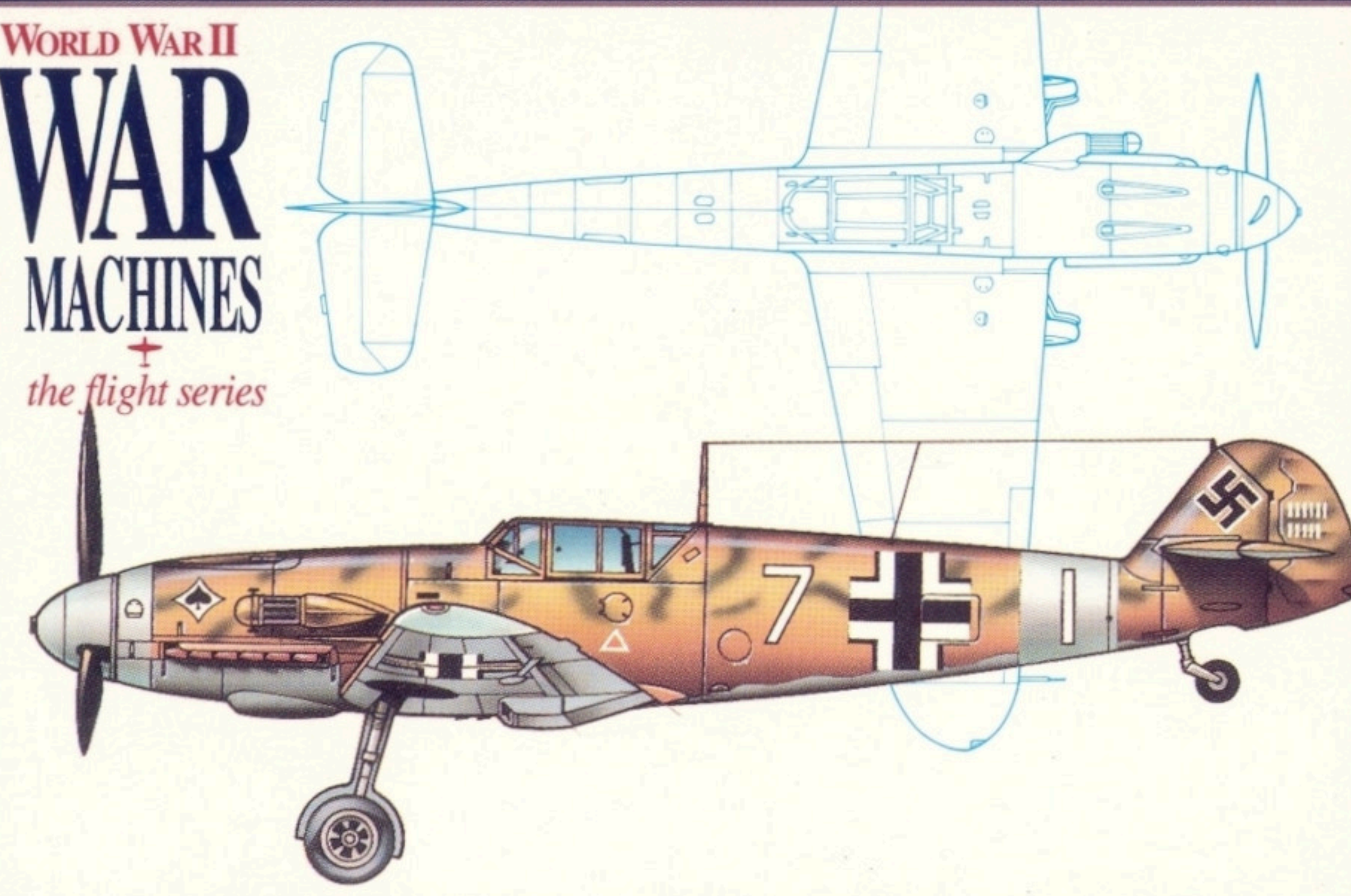
H8K2

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MACHINES
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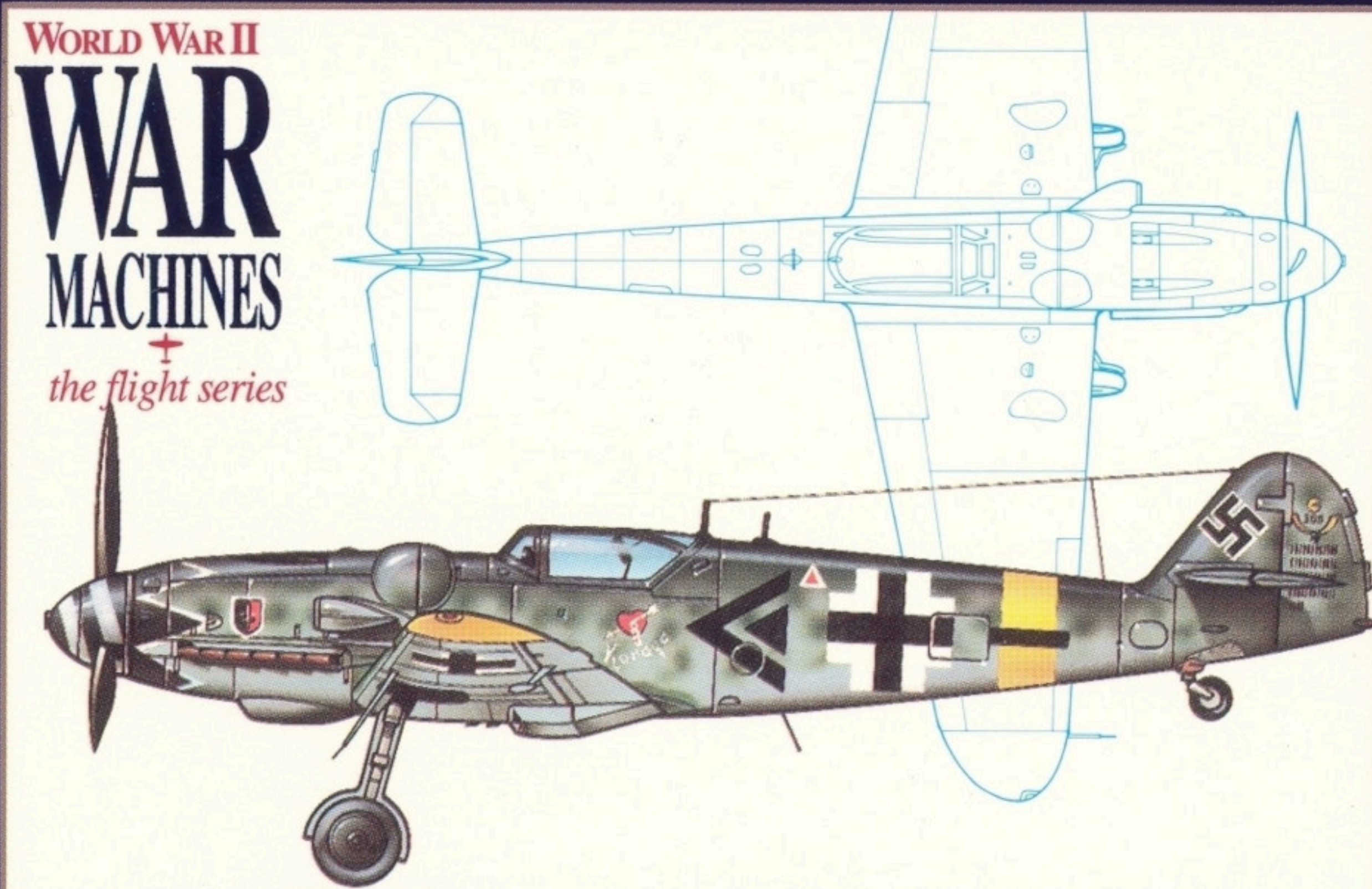
Bf 109E-4

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MACHINES
the flight series



Bf 109F-4/TROP

WORLD WAR II
WAR
MACHINES
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Bf 109G-14

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the flight series

73

**Yokosuka
D4Y1
Suisei**

First Printing
RG
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The Suisei, or Comet was designed to replace the D3A as Japan's primary carrier based dive bomber. This unusual design (liquid-cooled engine) went through a long and troubled development, and it wasn't until 1944 that D4Y1s dive bombers were made available. By that time Japan's carrier strength was on the wane and many D4Ys operated from land bases. The "Judy" (Allied code name) did not have a major impact on US forces. The only exception was the sinking of the carrier *Princeton* by a single D4Y1 in 1944 during the battle of Leyte Gulf. 660 D4Y1s were built, including this land-based aircraft serving with the 201st Naval Air Group in 1944.

Performance:
Maximum 343 m.p.h.
at 15,585 ft.
Range:
978 miles maximum
Engine:
1,010 h.p. 12 cylinder
liquid-cooled
Aichi Atsuta 12

Armament:
Three 7.7 mm MGs, one
551 lb. bomb in bomb bay,
two 66 lb. bombs on wings
Dimensions:
Wing span 37 ft. 8 in., Length
33 ft. 6 in., Height 12 ft. 1 in.
Ceiling:
32,480 ft.

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74

**Nakajima
B6N2
Tenzan**

First Printing
RG
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Operated from carriers and land bases, the B6N was the successor to the venerable B5N. It first appeared in 1943 in the Marshall Is. and flew for the remainder of the war. The "Jill", as it was code named by the Allies, had better overall performance than its counterpart — the Grumman TBF Avenger. B6Ns fought throughout the Pacific but were used in large numbers during the US attacks on Okinawa where they were used in suicide missions as well as in conventional torpedo attacks. The B6N2 pictured on this card carries standard Navy colors and markings that indicate it flew from the carrier *Taiho* in June of 1944 during the battle for the Marianas.

Performance:
Maximum 300 m.p.h.
at 16,000 ft.
Range:
1,084 miles maximum
Engine:
1,870 h.p. 14 cylinder Mitsubishi
Kasei 25 air-cooled radial

Armament:
Three 7.7 mm MGs, 1,764 lb
torpedo or six 220 lb. bombs
Dimensions:
Wing span 48 ft. 10 in., Length
35 ft. 7 in., Height 12 ft. 5 in.
Ceiling:
29,659 ft.

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75

**Mitsubishi
G3M2**

First Printing
RG
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Virtually unknown outside Japan until 1937, the G3M was the Japanese Navy's first modern bomber. It entered service in 1936 and went on to play a prominent role in the first several years of the war in the Pacific. The "Nell", as it was known to the Allies, is best known for its involvement in the sinking of the British battleship *Prince of Wales* and battle cruiser *Repulse*. The attack came off the Malayan coast a few days after the raid on Pearl Harbor. Most of the aircraft involved were torpedo armed G3M2s of the Saigon based Genzan Naval Air Group. The bomb carrying G3M2 pictured here displays that unit's colors. A little over 1,100 G3Ms were built.

Performance:
Maximum 236 m.p.h.
at 13,700 ft.
Range:
Maximum 2,900 miles
Engines:
Two 1,075 h.p. 14 cylinder
Mitsubishi Kinsei 45 air-cooled radials

Armament:
One 20 mm cannon, four
7.7 mm MGs and a 1,765 lb.
bomb or torpedo load
Dimensions:
Wing span 82 ft., Length
53 ft. 12 in., Height 12 ft.
Ceiling:
Approximately 32,800 ft.

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76

**Mitsubishi
G4M2**

First Printing
RG
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Many early war Japanese aircraft sacrificed protection for performance. The G4M proved to be an extreme example. Its phenomenal range was achieved by using extensive areas of the wings as massive but totally un-protected fuel storage tanks. The G4M was also armed inadequately and lightly constructed. This proved to be a deadly combination. US fighter pilots discovered that few hits were needed to cause catastrophic fires or explosions. Despite these shortcomings, the "Betty", as it was known to the Allies, was the most widely produced and used Japanese bomber. Over 2,400 were built. This G4M2, from an unknown unit, carries typical colors.

Performance:
Maximum 271 m.p.h.
at 15,100 ft.
Range:
Maximum 3,486 miles
Engines:
Two 1,850 h.p. 14 cylinder
Mitsubishi Kasei 22
air-cooled radials

Armament:
One 20 mm cannon (tail), three
7.7 mm MGs and 2,200 lb.
bomb load, or 1,764 lb. torpedo
Dimensions:
Wing span 81 ft. 8 in., Length
64 ft. 5 in., Height 13 ft. 5 in.
Ceiling:
Approximately 30,000 ft.

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77

**Mitsubishi
Ki-21-IIb**

First Printing
RG
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The model IIb was the last production model of the Ki-21 heavy bomber. By the time it entered service in 1942, the "Sally" (Allied code name) had been in service with the Japanese Army for five years. Earlier models saw action in China and it went on to serve as a front line bomber throughout the Pacific and in S.E. Asia. Although fast, it was lightly armed and carried a very light bomb load. Over 2,000 Ki-21s had been built when production was halted in 1944 in favor of more modern types. This Ki-21-IIb served with an unknown unit in the Dutch East Indies in 1944. It carries a color scheme designed to help conceal it in areas where palm trees were plentiful.

Performance:
Maximum 297 m.p.h.
at 13,100 ft.
Range:
Maximum 1,350 miles
Engines:
Two 1,490 h.p. 14 cylinder
Mitsubishi Ha-10
air-cooled radials

Armament:
One 12.7 mm, five 7.7 mm MGs
and a 2,205 lb. bomb load
Dimensions:
Wing span 73 ft. 9 in., Length
52 ft. 6 in., Height 15 ft. 11 in.
Ceiling:
Approximately 32,800 ft.

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78

**Kawanishi
H8K2**

First Printing
RG
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The US had the Catalina, the British had the Sunderland, and the Japanese had the best of all. The "Emily", as it was code named by the Allies, was the last in a long line of fine Japanese flying boats. It first entered service in 1942 and was in action in all areas of the Pacific. It had many attributes, but among the best was its range and endurance - 4,475 miles and up to 24 hours on a single mission. It was also heavily armed and could carry a substantial load of bombs or torpedos. When it was evaluated after the war in the US, it was found to be superior in performance to any flying boat used in WWII. Only about 150 H8K2s were built.

Performance:
Maximum 290 m.p.h.
at 16,400 ft.
Range:
Maximum 4,475 miles
Engines:
Four 1,850 h.p. 14 cylinder
Mitsubishi Kasei 22 air-cooled
radials

Armament:
Five 20 mm cannon, four 7.7 mm
MGs and 4,400 lb. bomb load, or
two 1,765 lb. torpedos
Dimensions:
Wing span 124 ft. 8 in., Length
92 ft. 3 in., Height 30 ft.
Ceiling:
Approximately 28,700 ft.

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79

**Messerschmitt
Bf 109E-4**

First Printing
RG
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There is little argument that the Bf 109 was one of the best fighters of the war. The "E" (Emil) series was being phased into front line service when the war began. In the air war over France and Britain Bf 109Es and early Spitfires were fairly evenly matched - the edge in agility going to the Spitfire and the edge in climb and dive rates going to the 109. In the Battle of Britain about 600 109Es were lost compared to 403 Spitfires and 630 Hurricanes. Many German pilots became aces flying the Emil, including Adolph Galland (104 victories). This Bf 109E-4 carries the camouflage and markings of JG (Jagdgeschwader) 26 in September of 1940 - the fighter wing eventually commanded by Galland.

Performance:
Maximum 354 m.p.h.
at 14,565 ft.
Range:
410 miles on internal fuel
Engine:
1,175 h.p. 12 cylinder liquid-cooled
Daimler-Benz 601A

Armament:
Three 20 mm cannon (wings and
propeller hub) and two 7.9 mm
MGs
Dimensions:
Wing span 32 ft. 4 in., Length
28 ft. 4 in., Height 7 ft. 5 in.
Ceiling:
34,450 ft.

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80

**Messerschmitt
Bf 109F-4/Trop**

First Printing
RG
the richards group, inc.

Like the Spitfire, the 109 evolved to meet new challenges. Built around a new engine, "F" series aircraft were "cleaned up" and given revised wings and tailplane. F series fighters entered the war in 1941 and famous ace Marseille scored most of his 158 kills in North Africa in Bf 109Fs. The F-4 (most numerous F) served with every fighter wing as a front line fighter until 1943. Considered by some to be the best 109 built, it could outclimb and outdive, but not outmaneuver a Spitfire V. This 109F-4/Trop carries typical desert camouflage and the markings of JG 53. "Trop" aircraft used special filters to combat the blowing sand and dust encountered in North Africa and Russia.

Performance:
Maximum 388 m.p.h.
at 21,325 ft.
Range:
528 miles
Engine:
1,350 h.p. 12 cylinder liquid-cooled
Daimler-Benz 601E

Armament:
One 20 mm cannon
and two 7.9 mm MGs
Dimensions:
Wing span 32 ft. 6 in., Length
29 ft. 7 in., Height 8 ft. 6 in.
Ceiling:
39,375 ft.

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**WAR
MACHINES**
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the flight series

81

**Messerschmitt
Bf 109G-14**

First Printing
RG
the richards group, inc.

In the Spring of 1942, production of the Bf 109G series began. Designed around another new engine, the "Gustav" sacrificed agility for speed. A staggering total of 35,000 109s were built during the war and 70% of them were G models. The most famous Bf 109 pilot was the highest scoring ace in history - Erich Hartmann with 352 victories. All of Hartmann's victories were on the eastern front between late 1942 and the end of the war, and all but a few in G sub types. Pictured here is Hartmann's G-14 when he served as commander of II Gruppe, JG 52 in the Spring of 1945. The only non-G 109 flown by Hartmann was the K-4 which exceeded 450 m.p.h.

Performance:
Maximum 386 m.p.h.
at 22,640 ft.
Range:
620 miles
Engine:
1,475 h.p. 12 cylinder liquid-cooled
Daimler-Benz 605A

Armament:
One 20 mm cannon
and two 13 mm MGs
Dimensions:
Wing span 32 ft. 6 in., Length
29 ft. 7 in., Height 8 ft. 6 in.
Ceiling:
37,900 ft.

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WAR
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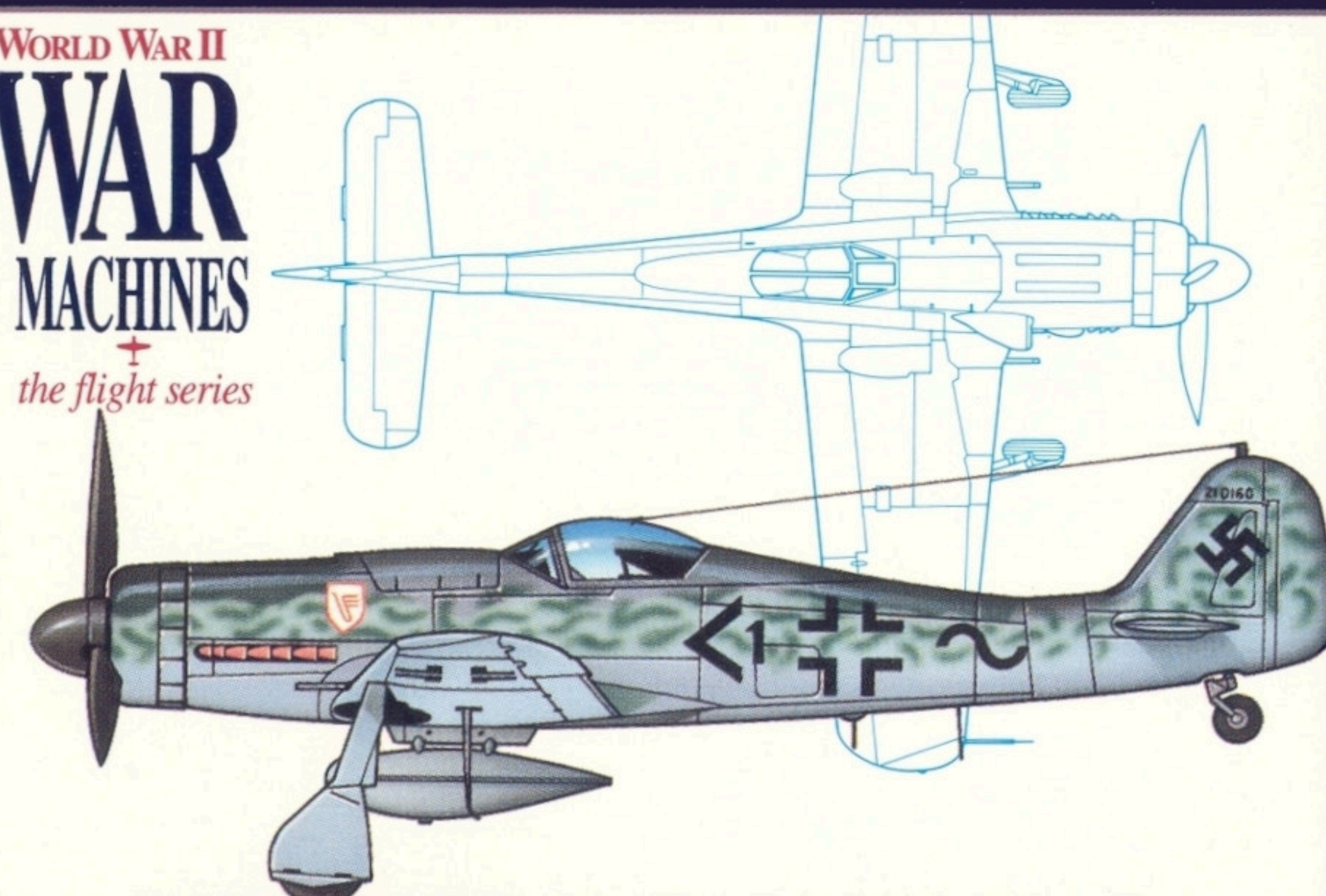
Bf 110C ZERSTÖRER

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MACHINES
the flight series



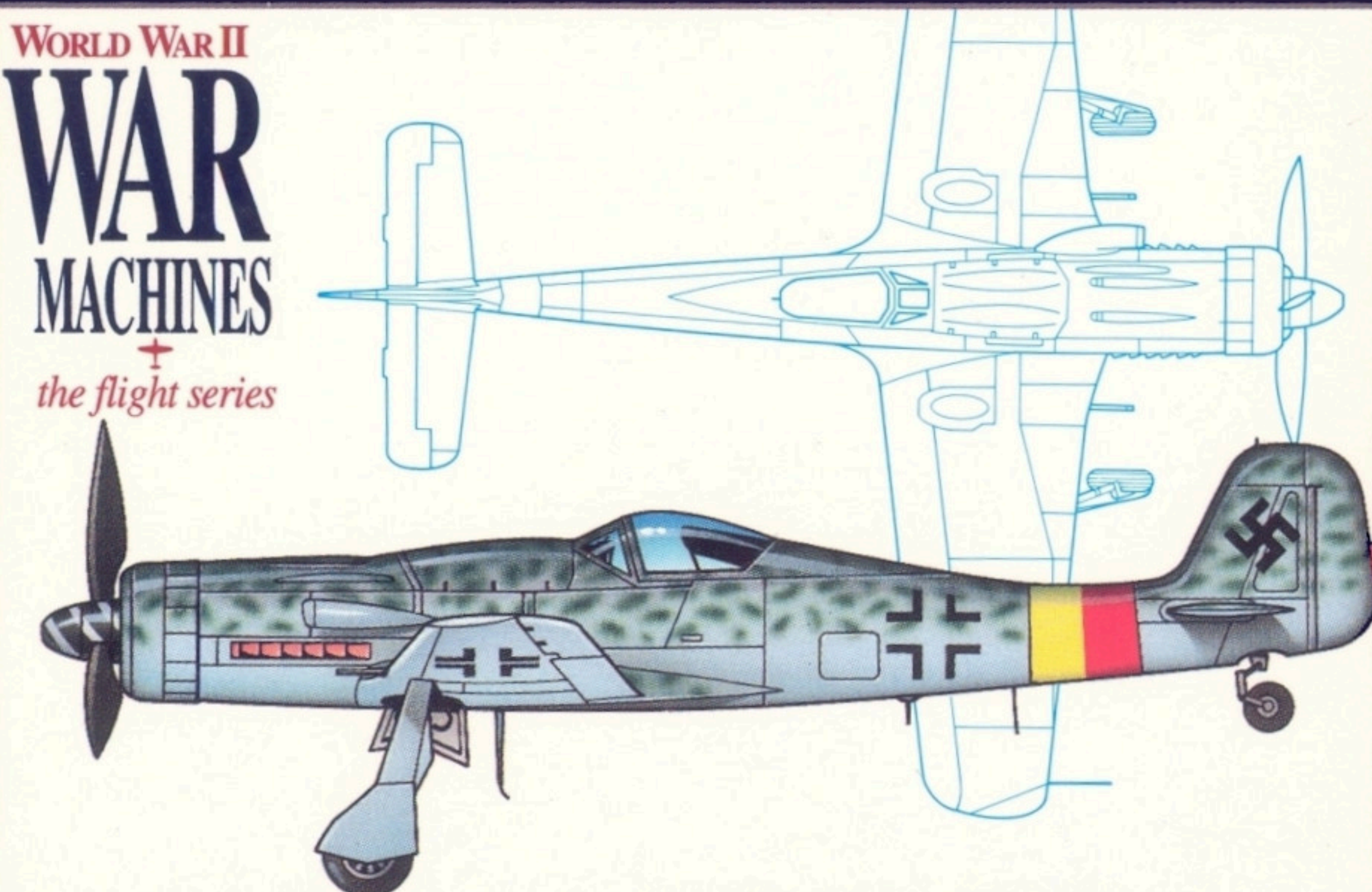
Fw 190A-5

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Fw 190D-9

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WAR
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the flight series



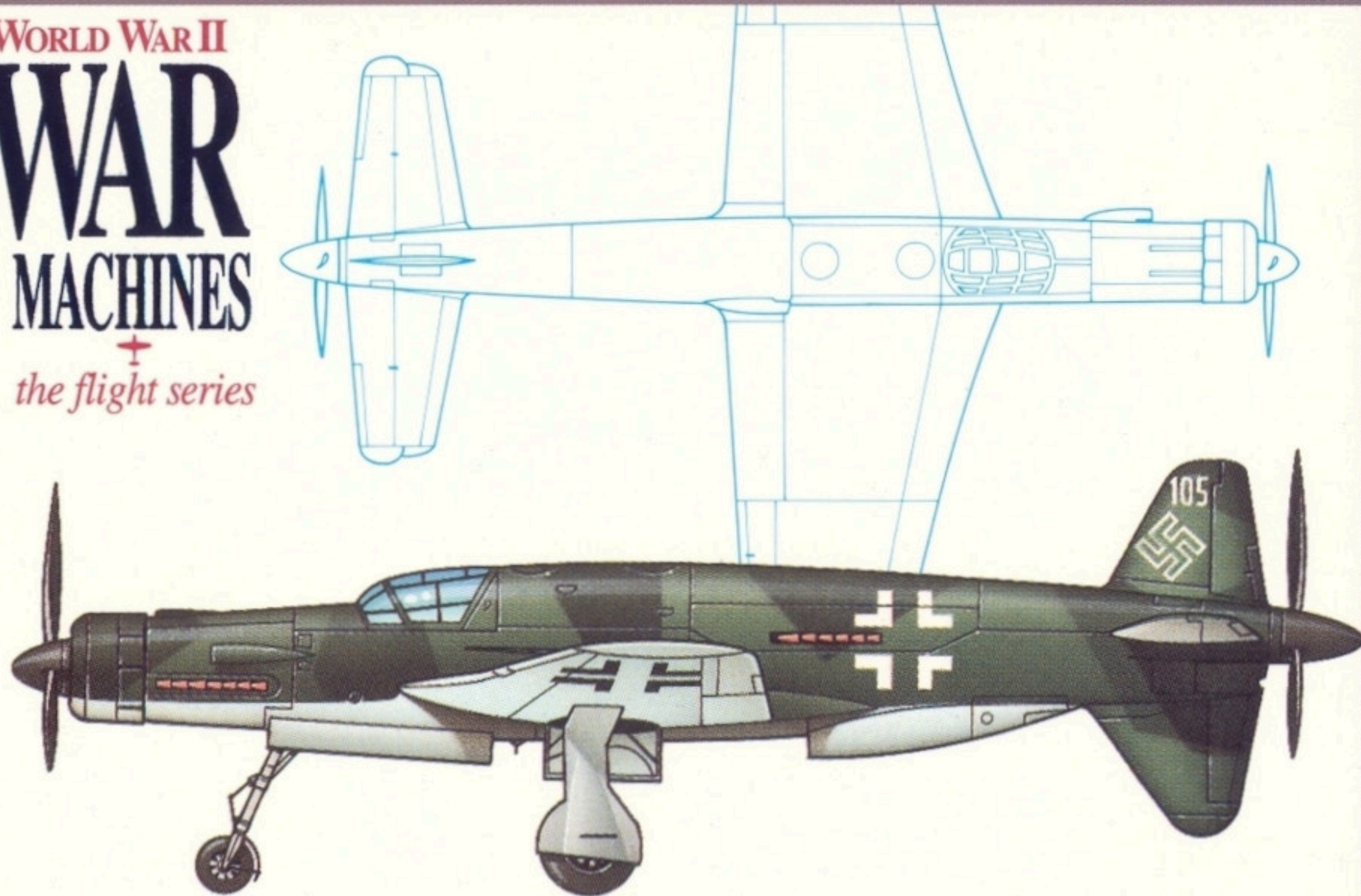
Ta 152C

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MACHINES
the flight series



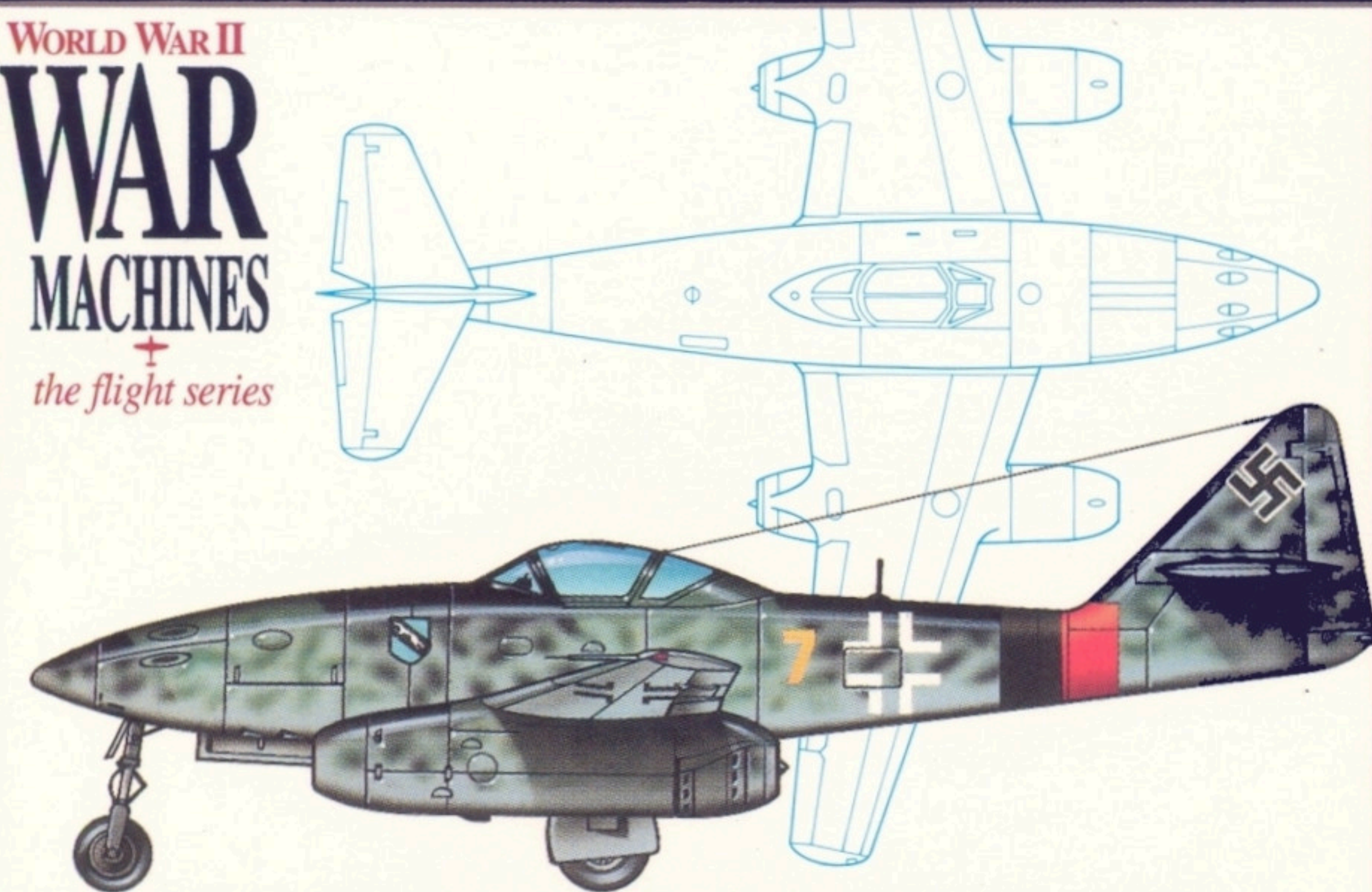
Me 410A HORNISSE

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WAR
MACHINES
the flight series



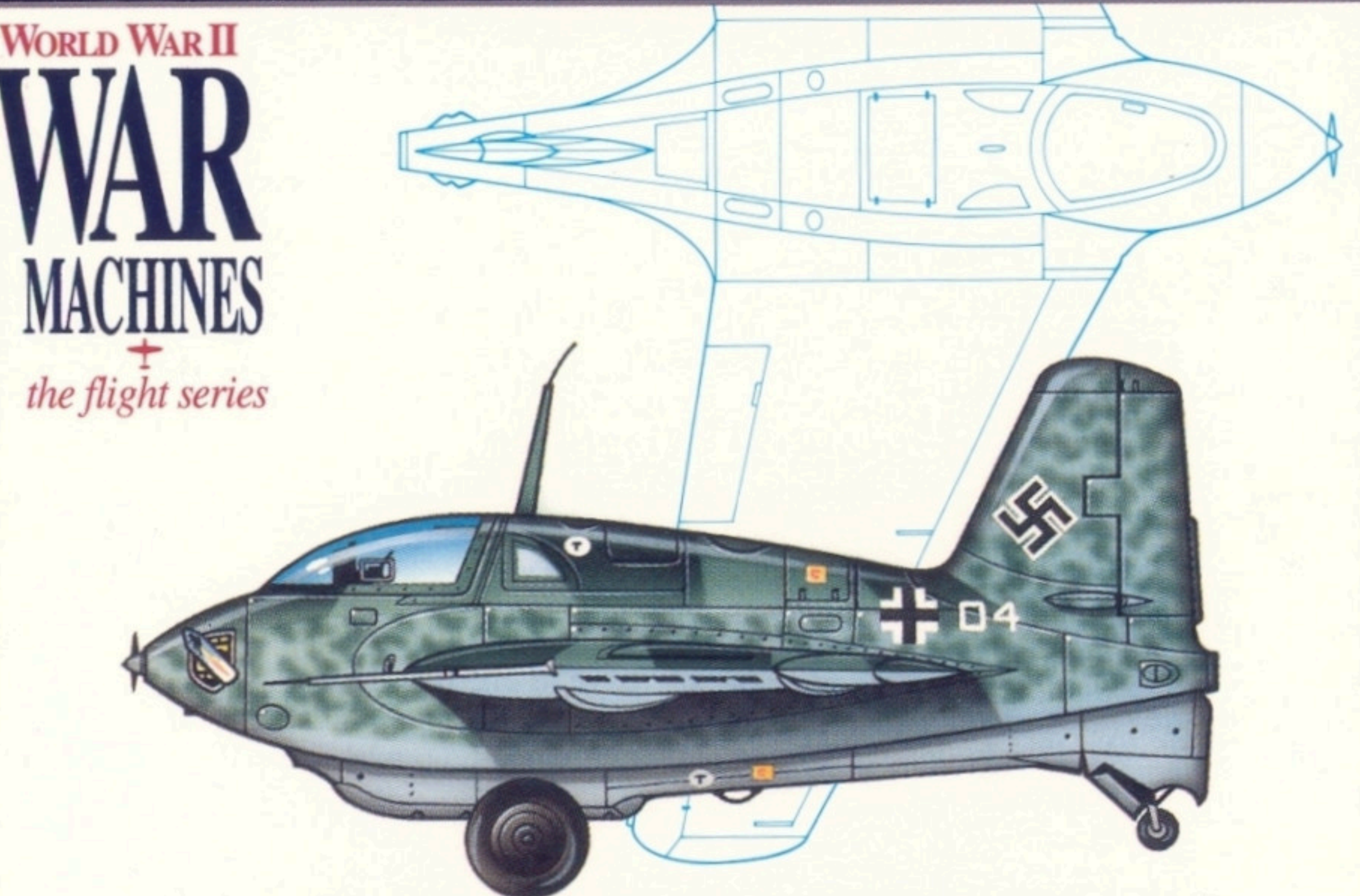
Do 335A-1 PFEIL

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WAR
MACHINES
the flight series



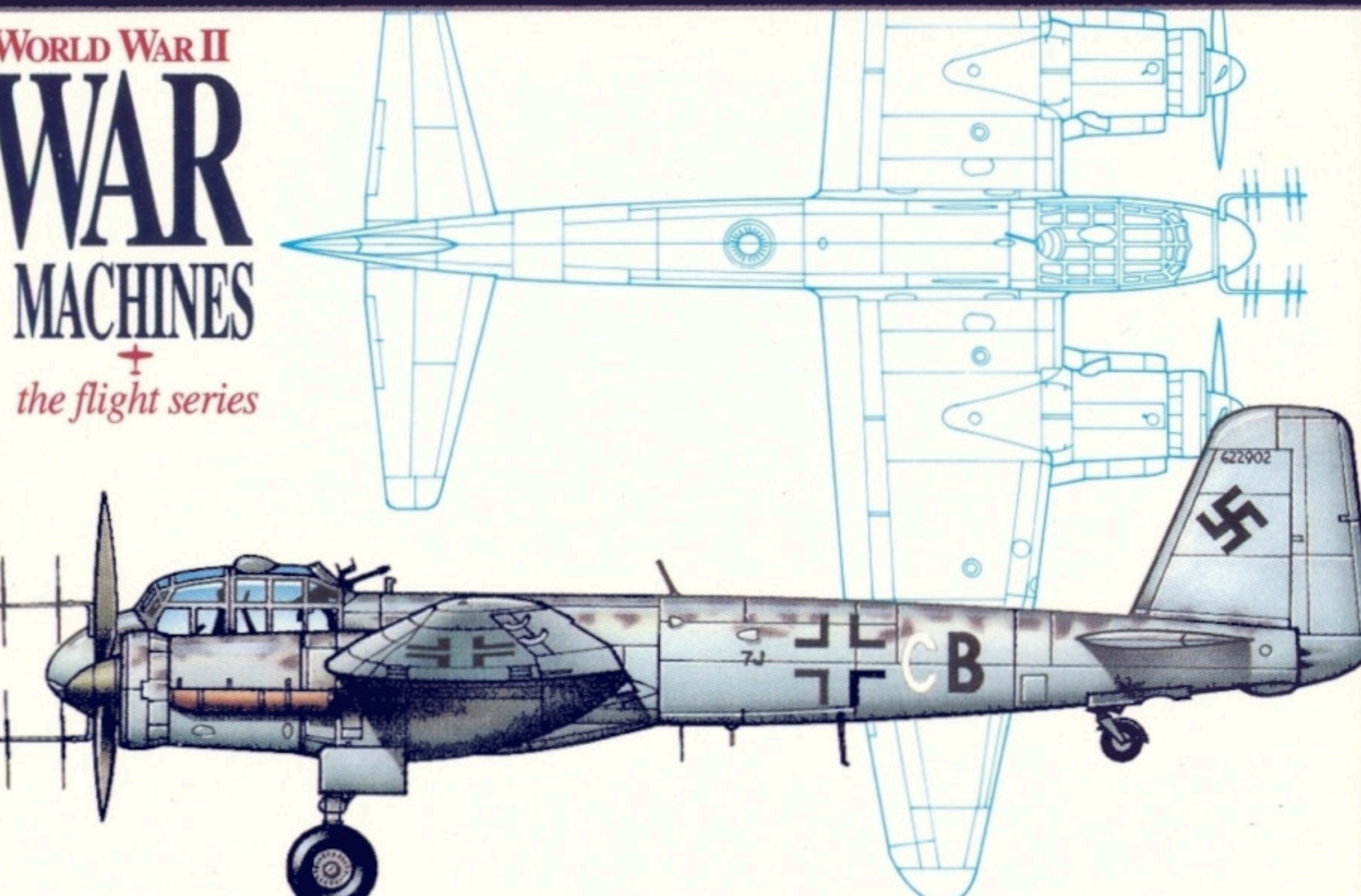
Me 262A-1 SCHWALBE

WORLD WAR II
WAR
MACHINES
the flight series



Me 163B-1 KOMET

WORLD WAR II
WAR
MACHINES
the flight series



Ju 88G-6

WORLD WAR II
**WAR
MACHINES**
+
the flight series

82

**Messerschmitt
Bf 110C
Zerstörer**

First Printing
RG
the richards group, inc.

Intended primarily as an escort for bombers, the Bf 110 heavy fighter is still regarded as a failure. In truth, it did not fulfill its original purpose - Spitfires and Hurricanes decimated escorting Bf 110 units over Britain. It was however a much greater success as a fighter-bomber and ground straffer on the Mediterranean and Eastern fronts. Still, it was at the mercy of more agile single-engined machines even in these theaters. The Bf 110C pictured on this card carries the white fuselage band used in the Mediterranean theater and the markings of Zerstörer-Geschwader 26. Bf 110s performed best as radar-equipped night fighters. Over 6,000 were built.

Performance:

Maximum 336 m.p.h.
at 19,680 ft.

Range:

Approximately 680 miles

Engines:

Two 1,050 h.p. 12 cylinder
liquid-cooled Daimler-Benz
DB 601A-1s

Armament:

Two 20 mm cannon, four 7.9 mm
MGs in nose, one 7.9 mm MG
in rear cockpit

Dimensions:

Wing span 55 ft. 4 in., Length
39 ft. 8 in., Height 11 ft. 6 in.

Ceiling:

Approximately 32,800 ft.

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**WAR
MACHINES**
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the flight series

83

**Focke-Wulf
Fw 190A-5**

First Printing
RG
the richards group, inc.

When the Fw 190A appeared in 1941, it was a shock to the Allies and for the first time the Luftwaffe had a fighter superior to the Spitfire V in every area of performance. "Butcher birds," as they were known to their pilots, were not only faster and more agile than any Allied fighter, but were also versatile. The "A" series included pure fighters, (about 13,300 built), fighter-bombers and close support variants (about 6,600 built), each with a wide selection of weapons possibilities. Pictured is an Fw 190A-5 fighter-bomber displaying the colors and markings of JG 54 in 1943. This fighter wing fought the entire war on the eastern front and was known as the Green Hearts.

Performance:

Maximum 408 m.p.h.
at 20,600 ft.

Range:

495 miles on internal fuel

Engine:

1,700 h.p. 14 cylinder BMW
801D-2 air-cooled radial

Armament:

Two 20 mm cannon, two 13 mm
MGs, 1,100 lb. bomb load

Dimensions:

Wing span 34 ft. 5 in., Length
29 ft. 4 in., Height 12 ft. 9 in.

Ceiling:

33,800 ft.

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84

**Focke-Wulf
Fw 190D-9**

First Printing
RG
the richards group, inc.

In August of 1944 a new longer-nosed version of the Fw 190 began to appear. This was the Fw 190D and it has been called the best piston-engined fighter ever built. Developed from the original Fw 190A design, it combined a refined airframe with a powerful liquid-cooled engine. Only about 700 left German factories before the end of the war and in the hands of the few experienced pilots left, they were deadly interceptors. Gunther Rall, (275 victories) flew Fw 190Ds with JG 300 in the last year of the war. The Fw 190D-9 pictured here carries the late war colors and markings of JG 3 Udet. This aircraft is in the US Air Force Museum collection in Dayton OH.

Performance:

Maximum 440 m.p.h.
at 21,650 ft.

Range:

520 miles on internal fuel

Engine:

1,776 h.p. 12 cylinder liquid-
cooled Junkers Jumo 213A-1

Armament:

Two 20 mm cannon, two
13 mm MGs and 1,100 lb.
bomb load

Dimensions:

Wing span 34 ft. 5 in., Length
33 ft. 5 in., Height 11 ft.

Ceiling:

32,810 ft.

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85

**Focke-
Wulf Ta
152C**

First Printing
RG
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Although similar in appearance to the Fw 190D, the Ta 152C was a complete airframe redesign around the DB 603 series engine. The resulting fighter was designed for maximum performance at middle altitudes and first flew in November of 1944. Records are incomplete, but about 67 Ta 152s were produced before the facility building them was captured by Soviet forces. This figure probably includes about 4 Ta 152H high altitude fighters with greatly extended wings. The only known fighter wing to operate the Ta 152 in combat was JG 301 in 1945. This Ta 152C displays Defense of the Reich fuselage recognition bands believed to have been used by JG 301.

Performance:

Maximum 443 m.p.h.
at 44,290 ft.

Range:

Approximately 775 miles

Engine:

2,100 h.p. 12 cylinder liquid-
cooled Daimler-Benz DB 603L

Armament:

One 30 mm cannon,
four 20 mm cannon

Dimensions:

Wing span 36 ft. 1 in., Length
35 ft. 5 in., Height 13 ft.

Ceiling:

40,350 ft.

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86

**Messerschmitt
Me 410A
Hornisse**

First Printing
RG
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The Hornisse (Hornet) was originally conceived as a replacement for the Bf 110 heavy fighter. In its original form (Me 210) it proved a failure. When redesigned as the Me 410, it served as a successful bomber destroyer, night-fighter and reconnaissance aircraft. It carried a diverse range of equipment and weapons packs, largest of which was the massive, Rheinmetall 50 mm cannon. A single round from this weapon was usually enough to bring down a bomber. The 410 entered service in early 1943 and by the end of the war, 1,160 had been built. This Me 410A-3 served with Aufklarungsgruppe (reconnaissance) 122 and was captured in Sicily in 1943.

Performance:

Maximum 388 m.p.h.
at 22,000 ft.

Range:

Approximately 1,050 miles

Engines:

Two 1,750 h.p. 12 cylinder
liquid-cooled Daimler Benz
DB 603As

Armament:

Two 20 mm cannon in nose, two
rear firing 13 mm MGs on fuse-
lage sides

Dimensions:

Wing span 53 ft. 8 in., Length
40 ft. 11 in., Height 14 ft.

Ceiling:

Approximately 32,800 ft.

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87

**Dornier Do
335A-1
Pfeil**

First Printing
RG
the richards group, inc.

German aviation produced many advanced designs during the war and perhaps one of the most interesting was the Pfeil (Arrow). This unique aircraft used two engines-one mounted in the nose and another in the tail. It was faster on one engine (348 m.p.h.) than many single engined fighters. Originally conceived in 1940, official disinterest caused it to languish and this potentially decisive aircraft arrived too late and in too few numbers to have any impact on the war. By war's end about 90 had been built and some of these were with operational units when the war ended. The A-1 model shown here was intended as a fighter-bomber and bomber interceptor and carries markings used in early 1945.

Performance:

Maximum 415-477 m.p.h.
at approximately 21,000 ft.

Range:

1,280 miles maximum

Engines:

Two 1,900 h.p. 12 cylinder
liquid-cooled Daimler-
Benz DB 603G-12s

Armament:

One 30 mm cannon and two 15
mm MGs and a 1,102 lb.
bomb load

Dimensions:

Wing span 45 ft. 3 in., Length
45 ft. 5 in., Height 16 ft. 4 in.

Ceiling:

Approximately 37,400 ft.

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88

**Messerschmitt
Me 262A-1
Schwalbe**

First Printing
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In the closing months of 1944, US bombers began to encounter the world's first operational jet fighter - the Me 262 Schwalbe (Swallow). The best Allied fighters could only hope to catch an Me 262 by surprise after a high speed dive, or on takeoff/landing, or when the jet experienced engine trouble. There were 22 jet aces, the top scorer being Heinz Bar - 16 of his total 220 kills were as a Me 262 pilot. Several hundred of these fast, agile and powerfully armed machines saw combat before the war's end. Had they become available earlier they may have altered the course of the war. This Me 262 from Jagdgeschwader 7 is in the National Air & Space Museum collection.

Performance:

Maximum 540 m.p.h.
at 19,685 ft.

Range:

650 miles on internal fuel

Engines:

Two 1,980 lb. thrust Junkers
Jumo 004B axial turbojets

Armament:

Four 30 mm cannon in nose

Dimensions:

Wing span 40 ft. 11 in., Length
34 ft. 9 in., Height 12 ft. 7 in.

Ceiling:

37,565 ft.

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89

**Messerschmitt
Me 163B-1
Komet**

First Printing
RG
the richards group, inc.

There is little doubt that the most unconventional aircraft to fly in WWII was the Komet. This short, rocket powered aircraft with no rear wings and jettisonable wheels flew for the first time in August of 1941. Shortly after, it set a world speed record of 622 m.p.h. It didn't reach combat units until August of 1944. Flights in the Me 163 were fast, but brief - average combat time was about 8 minutes. They scored successes against US bombers, but attrition rates through accidents were high. Between 350 and 370 Komets were built - not enough to make a difference in the war. This Komet displays one of several late war camouflage schemes used by Jagdgeschwader 400.

Performance:

Maximum 596 m.p.h.
at 32,800 ft.

Range:

2 to 3 minutes after climb

Engine:

3,748 lb. thrust Walter
HWK 509A rocket motor

Armament:

Two 30 mm cannon, 24
unguided rockets

Dimensions:

Wing span 30 ft. 7 in., Length
19 ft. 2 in., Height 9 ft.

Ceiling:

39,700 ft.

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90

**Junkers
Ju 88G-6**

First Printing
RG
the richards group, inc.

The adaptable Ju 88 airframe was especially sturdy and its speed sufficient to enable it to serve as a heavy fighter and night fighter. The ultimate Ju 88 night fighters - the G series - began appearing in late 1943. Over 2,500 Gs were built in 1944 alone and they took a heavy toll of British bombers. Radar-equipped Ju 88G-6s frequently used upward-firing, cannon called Schrage Musik (Jazz Music) to tear into the vulnerable bellies of night bombers. With an endurance of five hours, they could undertake long patrols in German airspace and also intercept British bombers as they took off or landed at their own bases. Ju 88G-6s like this one with Nachtjagdgeschwader 102 fought until the war's final days.

Performance:

Maximum 360 m.p.h. at 20,000 ft.

Range:

1,360 miles

Engines:

Two 1,750 h.p. 12 cylinder liuid-
cooled Junkers Jumo 213A-1s

Armament:

Four 20 mm cannon in pod under
fuselage, two upward firing 20
mm cannon one 13 mm MG

Dimensions:

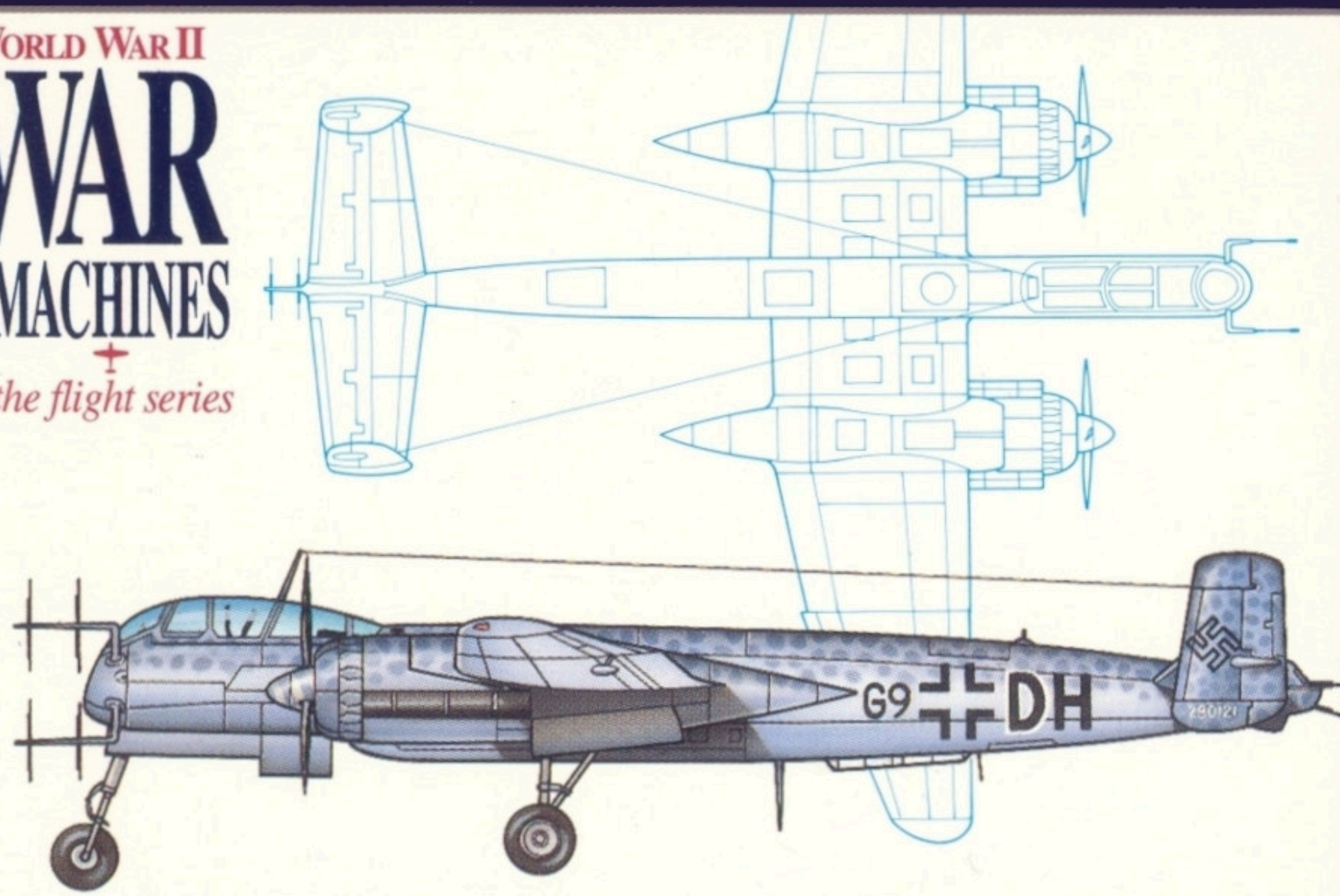
Wing span 65 ft. 10 in., Length
53 ft. 8 in., Height 15 ft.

Ceiling:

Approximately 31,500 ft.

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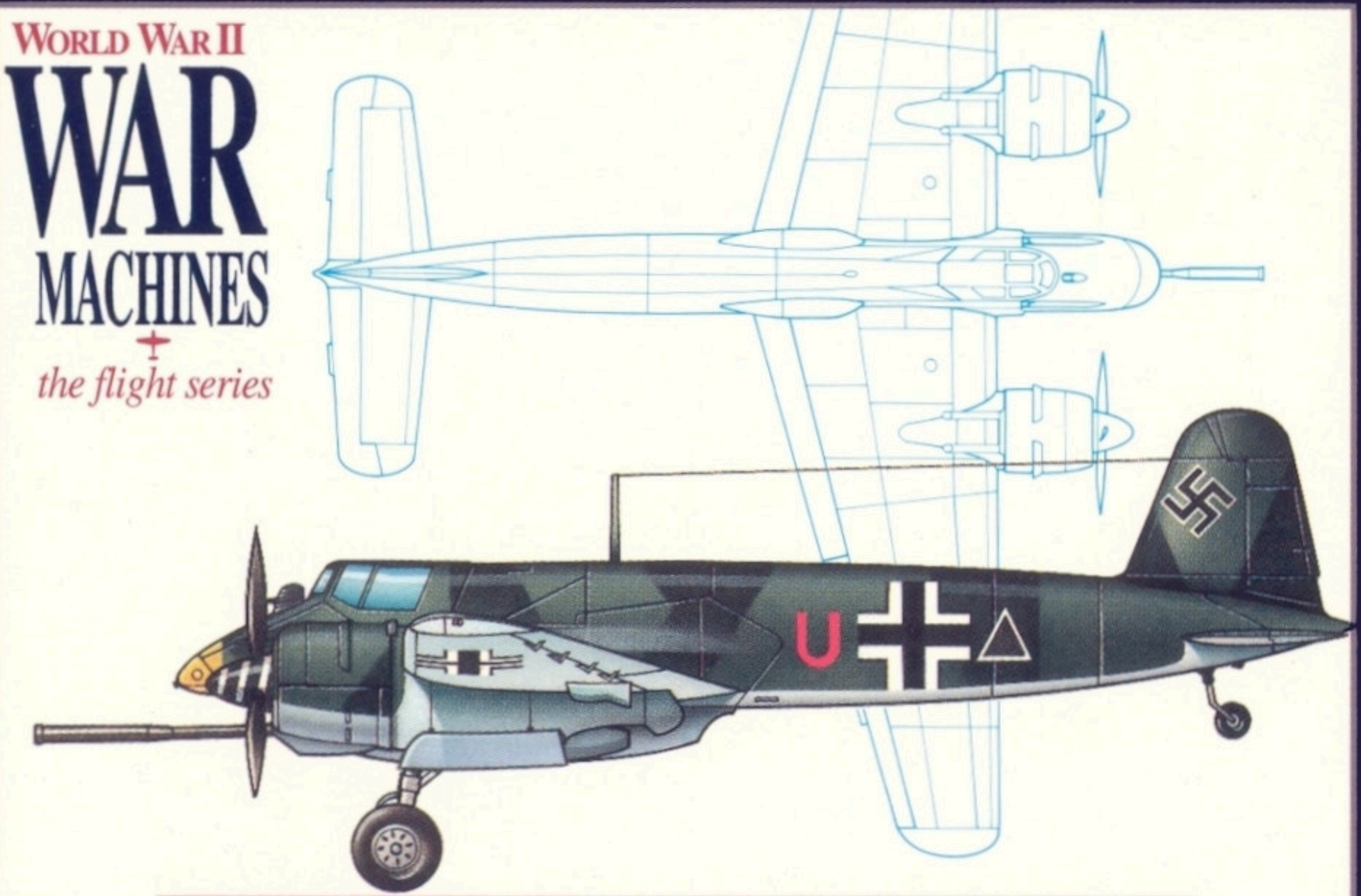
He 219A-7 UHU

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MACHINES
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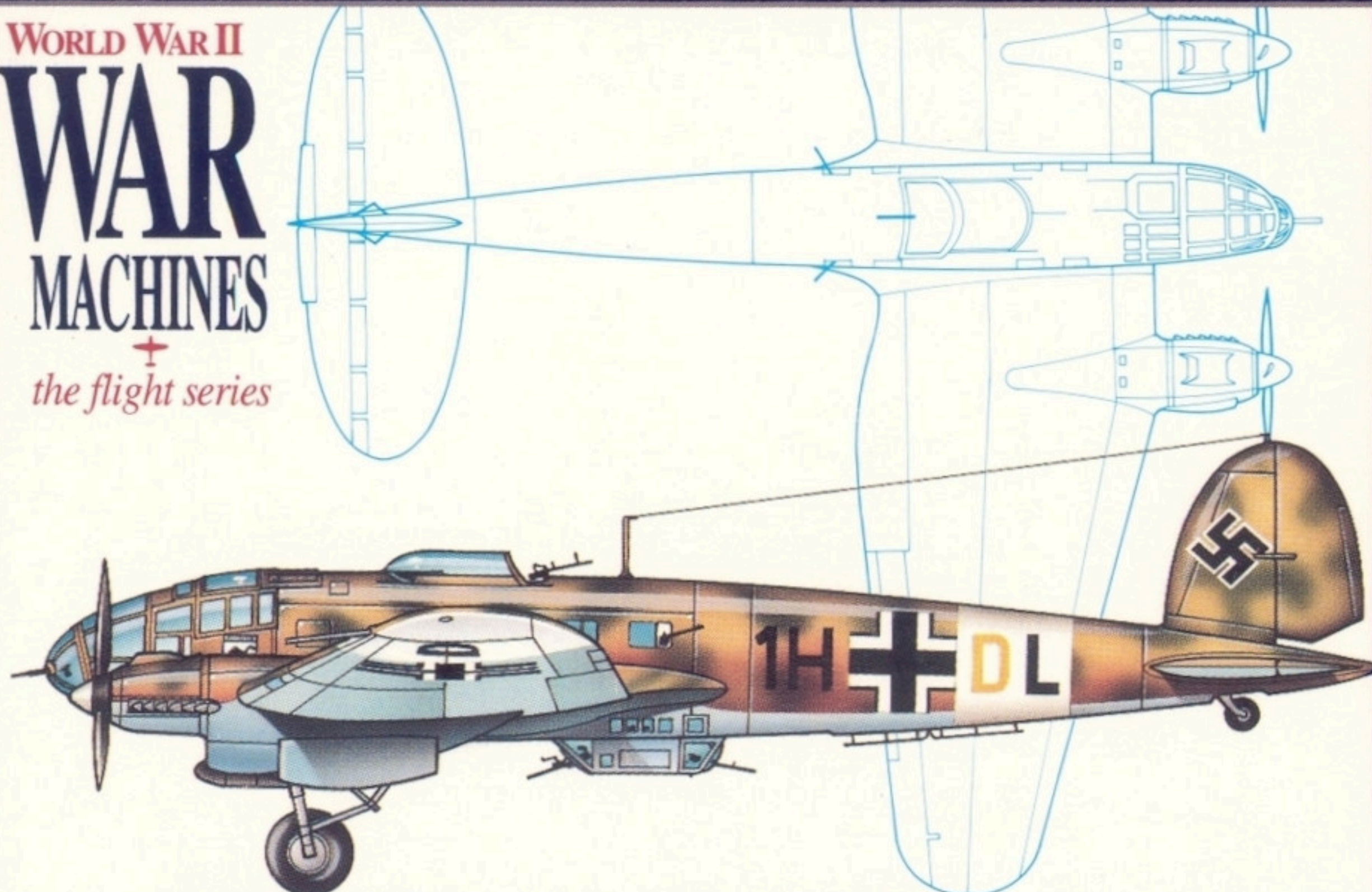
Ju 87G-1 STUKA

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MACHINES
+
the flight series



Hs 129B-3/Wa

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the flight series



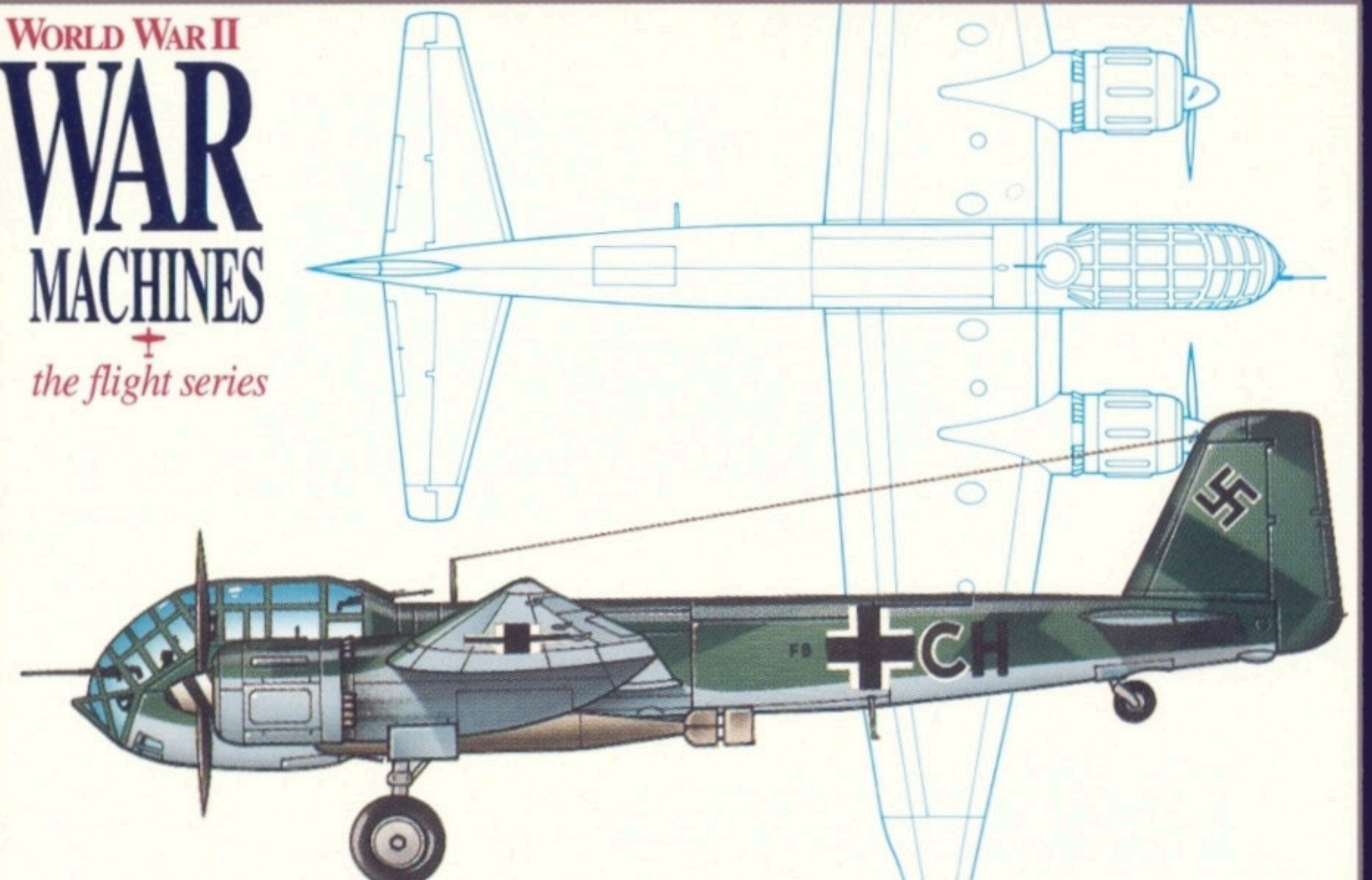
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WAR
MACHINES
+
the flight series



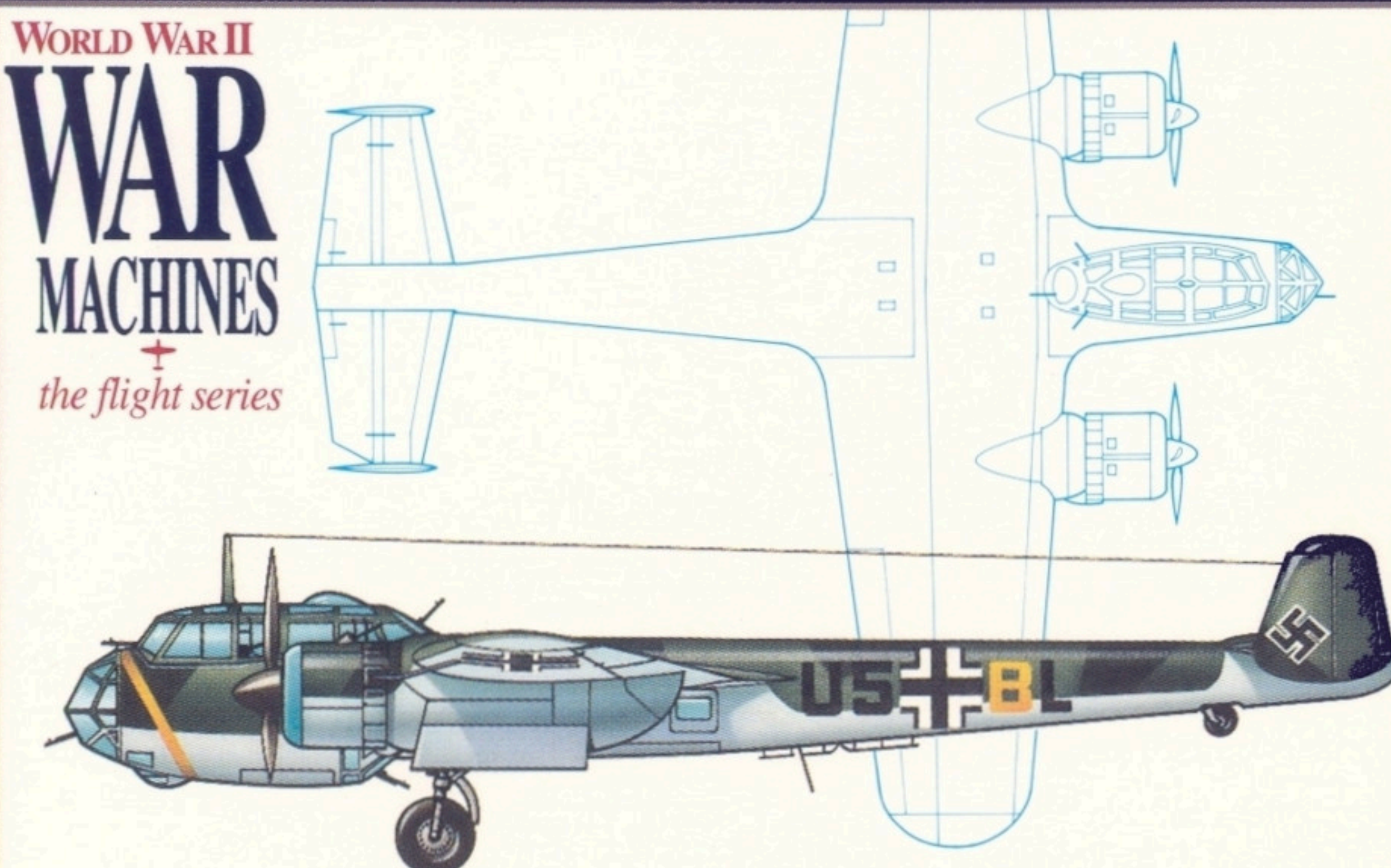
Ju 88A-4

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MACHINES
+
the flight series



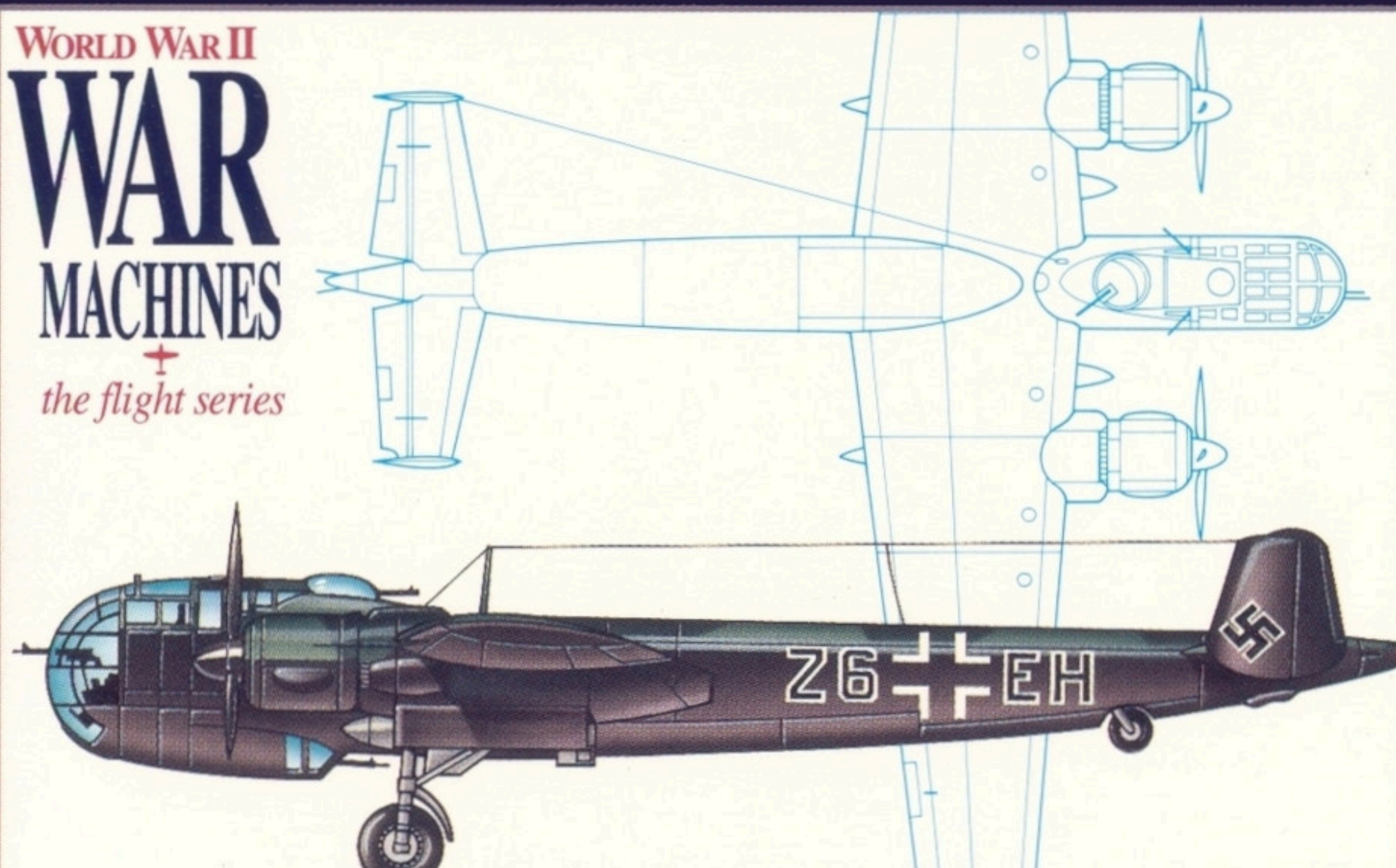
Ju 188E-2

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WAR
MACHINES
+
the flight series



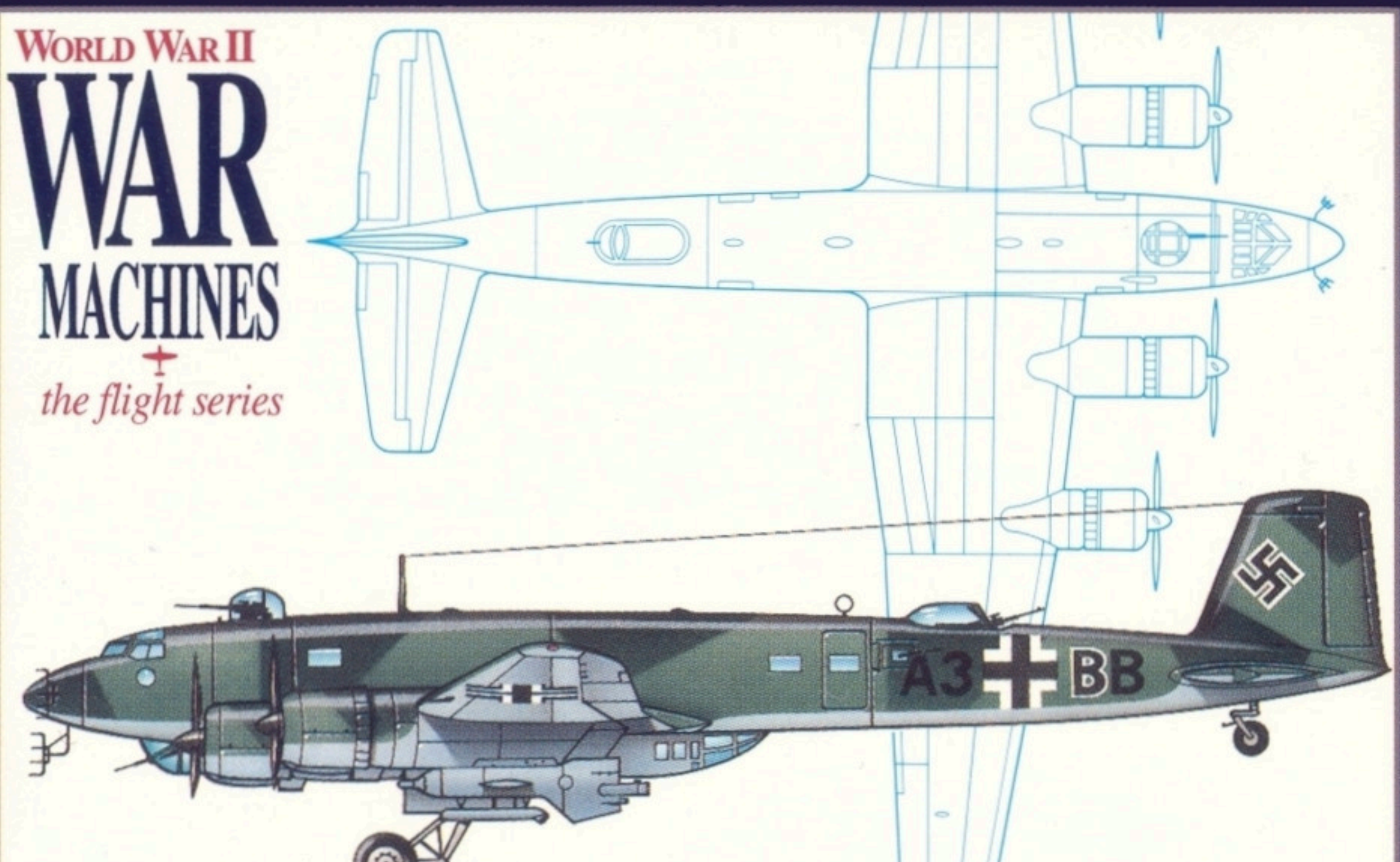
Do 17Z-2

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WAR
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Do 217K-2

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Fw 200C-8 CONDOR

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91

**Heinkel
He 219A-7
Uhu**

First Printing
RG
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As a night-fighter, the Uhu (Owl) was aptly named and it is generally regarded as one of the best aircraft ever built for that role. The first of these fast, radar-equipped aircraft made their way to operational units in 1944 and results were impressive - 5 or 6 RAF bombers a night, was not unusual even with escorting Mosquito fighters providing interference. A bewildering variety of weapons arrangements were used, including the upward-firing *Schrage Musik*, or Jazz Music. Bombers attacked from below usually never detected the Owl. The He 219A-7 shown here - one of only 268 A series Owls built - carries the markings of Nachtjagdgeschwader I.

Performance:

Maximum 416 m.p.h.
at 22,960 ft.

Range:

Approximately 1,243 miles

Engines:

Two 1,900 h.p. 12 cylinder
liquid-cooled Daimler-Benz
DB 603Gs

Armament:

Six 30 mm cannon, two in wings,
two in ventral tray, two in rear
fuselage firing upwards

Dimensions:

Wing span 60 ft. 8 in., Length
50 ft. 11 in., Height 13 ft. 5 in.

Ceiling:

Approximately 41,600 ft.

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92

**Junkers
Ju 87G-1
Stuka**

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The Stuka was a natural supplement to the doctrine of Blitzkrieg. In support of ground forces it was a deadly and terrifying weapon - provided it had fighter protection. Without it, Stukas were very vulnerable. Its design and rugged construction allowed it to dive vertically on targets and its stability in a dive permitted exceptional accuracy. In 1943 the G model entered service. Designed as a tank buster, it was very effective until Soviet fighters became too numerous to counter. Hans Rudel is credited with 519 tank kills while flying Stukas. The Ju 87G-1 pictured here carries the markings of Rudel's unit - Stukageschwader 2 - in late 1944. By war's end, 5,700 Stukas had been built.

Performance:

Maximum about 235
m.p.h. at 10,700 ft.

Range:

Approximately 620 miles

Engine:

1,300 h.p. 12 cylinder
liquid-cooled

Junkers Jumo 211 D

Armament:

Two 37 mm cannon in under-
wing pods, two 7.92 mm MGs

Dimensions:

Wing span 45 ft. 3 in.,
Length 37 ft. 8 in.,
Height 12 ft. 9 in.

Ceiling:

Approximately 24,000 ft.

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**WAR
MACHINES**
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93

**Henschel
Hs 129
B-3/Wa**

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The Hs 129 began as a general ground attack and close support aircraft and evolved into a specialized anti-tank weapon. It became operational in early 1942 on the eastern front and proved very effective. The entire front section of the aircraft was heavily armored - 6 to 12 mm of steel and a windscreen over 3 inches thick. Weapons carried varied - 20 and 30mm cannon on B1 and B2 models, 37 mm cannon on later B2s and B3s. The B3 on this card carries a massive 75 mm cannon extending 8 ft. beyond the nose. It served with Schlachtgeschwader (close support) 9 on the eastern front in 1944. A total of 869 Hs 129s were built before production ended in 1944.

Performance:

Maximum 253 m.p.h.
at 12,500 ft.

Range:

Approximately 500 miles

Engines:

Two 690 h.p. 14 cylinder
Gnome-Rhone 14M
air-cooled radials

Armament:

One ventrally mounted 75 mm
cannon, 20/30 mm cannon in nose

Dimensions:

Wing span 46 ft. 7 in., Length
31 ft. 11 in., Height 10 ft. 8 in.

Ceiling:

Approximately 29,530 ft.

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**WAR
MACHINES**
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**Heinkel
He 111H-6**

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Germany developed but never put into production large strategic bombers - the He 111, a medium bomber, was the best available when the war began. It performed well until the Battle of Britain revealed that it had poor defensive capabilities and carried an inadequate bomb load. After 1940 it served on the Russian front, and as an anti-shipping and torpedo bomber in the Mediterranean and North Sea. Over 7,000 He 111s were built and it served well past obsolescence because there was nothing better to replace it. This He 111H-6 carries Kampfgeschwader 26 markings and the Mediterranean theater camouflage in use when this unit was based in Sicily in 1941.

Performance:

Maximum 258 m.p.h.
at 16,400 ft.

Range:

760 miles with full load

Engines:

Two 1,340 h.p. 12 cylinder
liquid-cooled Junkers Jumo
211F-2s

Armament:

Five or six 7.9 mm MGs, one 20
mm cannon and 5,510 lb. bomb
load, or two torpedos

Dimensions:

Wing span 74 ft. 1 in., Length
54 ft. 15 in., Height 13 ft. 1 in.

Ceiling:

25,500 ft.

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WORLD WAR II
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MACHINES**
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**Junkers
Ju 88A-4**

First Printing
RG
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The Ju 88 family of aircraft has been called the "backbone" of the Luftwaffe and "the most versatile German combat aircraft of WWII". In its various forms it served as bomber, torpedo bomber, night fighter, tank destroyer, heavy fighter and reconnaissance aircraft. Proof of its importance is the fact that between 1938 and 1945 it was continuously in production and almost 15,000 were built. Ju 88s served with most Kampfverbände (bomber units), saw action on every war front and proved to be one of the least vulnerable Luftwaffe bombers. This Ju 88A-4 level/dive bomber carries the yellow fuselage band of the eastern front and the markings of Kampfgeschwader 3, Russia 1941.

Performance:

Maximum 292 m.p.h.
at 17,400 ft.

Range:

1,110 miles

Engines:

Two 1,340 h.p. 12 cylinder liquid-
cooled Junkers Jumo 211J-1s

Armament:

Three 7.9 mm and two 13 mm
MGs, 1,100 lb. internal and
2,200 lb. external bomb load

Dimensions:

Wing span 65 ft. 7 in., Length
47 ft. 3 in., Height 15 ft. 11 in.

Ceiling:

Approximately 26,900 ft.

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**WAR
MACHINES**
the flight series

96

**Junkers Ju
188E-2**

First Printing
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The bomber, torpedo bomber and reconnaissance branch of the Ju 88 family evolved into the Ju 188 and finally the Ju 388. In these designs the cockpit was larger and more streamlined, the engines were more powerful and the wings were of increased length. Ju 188E series aircraft were powered by BMW radials and A series Ju 188s received Jumo liquid-cooled V-12s, but were otherwise similar. The Ju 188E-2 was a successful radar-equipped torpedo bomber that began to appear in 1943. About 1,100 Ju 188s of all types were built and they tended to supplement rather than replace older Ju 88s. The one shown here carries the markings of KG (Kampfgeschwader) 40 in early 1944.

Performance:

Maximum 310 m.p.h.
at 19,685 ft.

Range:

1,210 miles

Engines:

Two 1,700 h.p. 14 cylinder BMW
801D-2 air-cooled radials

Armament:

One 20 mm cannon, one 13 mm
MG, 2 7.9 mm MGs and two
2,200 lb. torpedos

Dimensions:

Wing span 72 ft. 2 in., Length
49 ft. 1 in., Height 14 ft. 7 in.

Ceiling:

Approximately 30,670 ft.

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WORLD WAR II
**WAR
MACHINES**
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**Dornier
Do 17Z-2**

First Printing
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When WWII began, Germany's bomber force consisted of three main types, all designed in the 1930s - the He 111, the Ju 88 and the Do 17. Germany had 370 of these light bombers when the war began and against the light air opposition it faced early in the war, the Do 17 performed well. In the air war over Britain its high speed diving attacks and excellent maneuverability made it less vulnerable than the larger He 111, but it proved to be underarmed and lacking in crew armor. This light bomber went on to serve in the Greek, Balkan and Russian campaigns before being phased out of front-line service in 1942. This Do 17Z-2 carries the markings of Kampfgeschwader 2 in 1940.

Performance:

Maximum 263 m.p.h.
at 16,400 ft.

Range:

745 miles with full load

Engines:

Two 1,000 h.p. 9 cylinder
BMW Bramo 323P
air-cooled radials

Armament:

Six 7.9 mm MGs and maximum
2,205 lb. bomb load

Dimensions:

Wing span 59 ft., Length
51 ft. 9 in., Height 14 ft. 11 in.

Ceiling:

Approximately 22,965 ft.

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MACHINES**
the flight series

98

**Dornier
Do 217K-2**

First Printing
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Two major Do 217 variants - the E and the K - were successful conventional bombers and anti-shipping aircraft. Both were used to bomb Britain at night and both launched the massive Hs 293 and Fritz X radio guided glide bombs at Allied shipping. These early cruise missiles scored hits on the British battleship *Warspite*, the Italian battleships *Roma* and *Italia* (after Italy's capitulation), and many other warships. The last Hs 293 missile attack came on April 12, 1945 when Do 217s of Kampfgeschwader (KG) 200 hit bridges over the Oder River in an attempt to stop Soviet advances. This Do 217K-2 carries KG 66 markings, northern France, 1943.

Performance:

Maximum 330 m.p.h.
at 13,125 ft.

Range:

Approximately 1,400 miles

Engines:

Two 1,700 h.p. 18 cylinder
BMW 801D air-cooled radials

Armament:

Seven 7.9 mm MGs, two 13 mm
MGs and two 3,454 lb. FX 1400
Fritz X glide bombs

Dimensions:

Wing span 81 ft. 4 in., Length
55 ft. 9 in., Height 16 ft. 3 in.

Ceiling:

Approximately 29,500 ft.

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**WAR
MACHINES**
the flight series

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**Focke Wulf
Fw 200C-8
Condor**

First Printing
RG
the richards group, inc.

Beneath the war-time modifications, the Condor's graceful lines clearly indicate its pre-war origins as an airliner. With its superb range, these modifications enabled the Condor to serve as a maritime bomber and reconnaissance aircraft. Despite its make-shift appearance, Condors were used effectively against Allied merchant convoys in the Atlantic. They sank 360,000 tons of shipping between mid-1940 and January 1941 alone. The C-8 (last production model) shown here carries two radio-controlled glide bombs - new weapons used extensively in 1944 and for which the C-8 was adapted. This Condor displays standard camouflage and the markings of Kampfgeschwader 200. Only 276 Condors were built.

Performance:

Maximum 208 m.p.h.
at approximately 16,000 ft.

Range:

2,210 miles

Engines:

Four 1,200 h.p. 9 cylinder
BMW Bramo 323R-2
air-cooled radials

Armament:

Three to five 7.9 mm MGs, one
20 mm cannon and 4,620 lbs. of
bombs or 2 Hs 293 guided missiles

Dimensions:

Wing span 107 ft. 9 in., Length
76 ft. 11 in., Height 20 ft. 8 in.

Ceiling:

Approximately 19,000 ft.

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Ar 234B-2 BLITZ

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100

Arado
Ar 234B-2
Blitz

First Printing

RG
the richards group, inc.

Too little, too late but a truly remarkable aircraft, the Blitz was the only jet bomber to become operational during the war. Reconnaissance versions (B-1s) entered service first, in mid-1944. Bombers (B-2s) entered service toward the end of 1944, participating in the Ardennes offensive and in attempts to keep the Allies from crossing the Rhine. They were used for pin-point attacks on targets like the Remagen Bridge which Ar 234s attacked with 2,205 lb. bombs while being covered by Me 262 jet fighters. 210 B models were built, as well as about 14 faster four-engined C models. This AR 234B-2 displays the markings of Kamfgeschwader 76, the first bomber unit to receive the Blitz.

Performance:

Maximum 461 m.p.h.
at 19,685 ft.

Range:

684 miles with 3,300 lb. bomb
load

Engines:

Two 1,984 lb. thrust Jumo 004B
axial turbojets

Armament:

Two fixed rear-firing 20 mm
cannon and 3,300 lbs of bombs

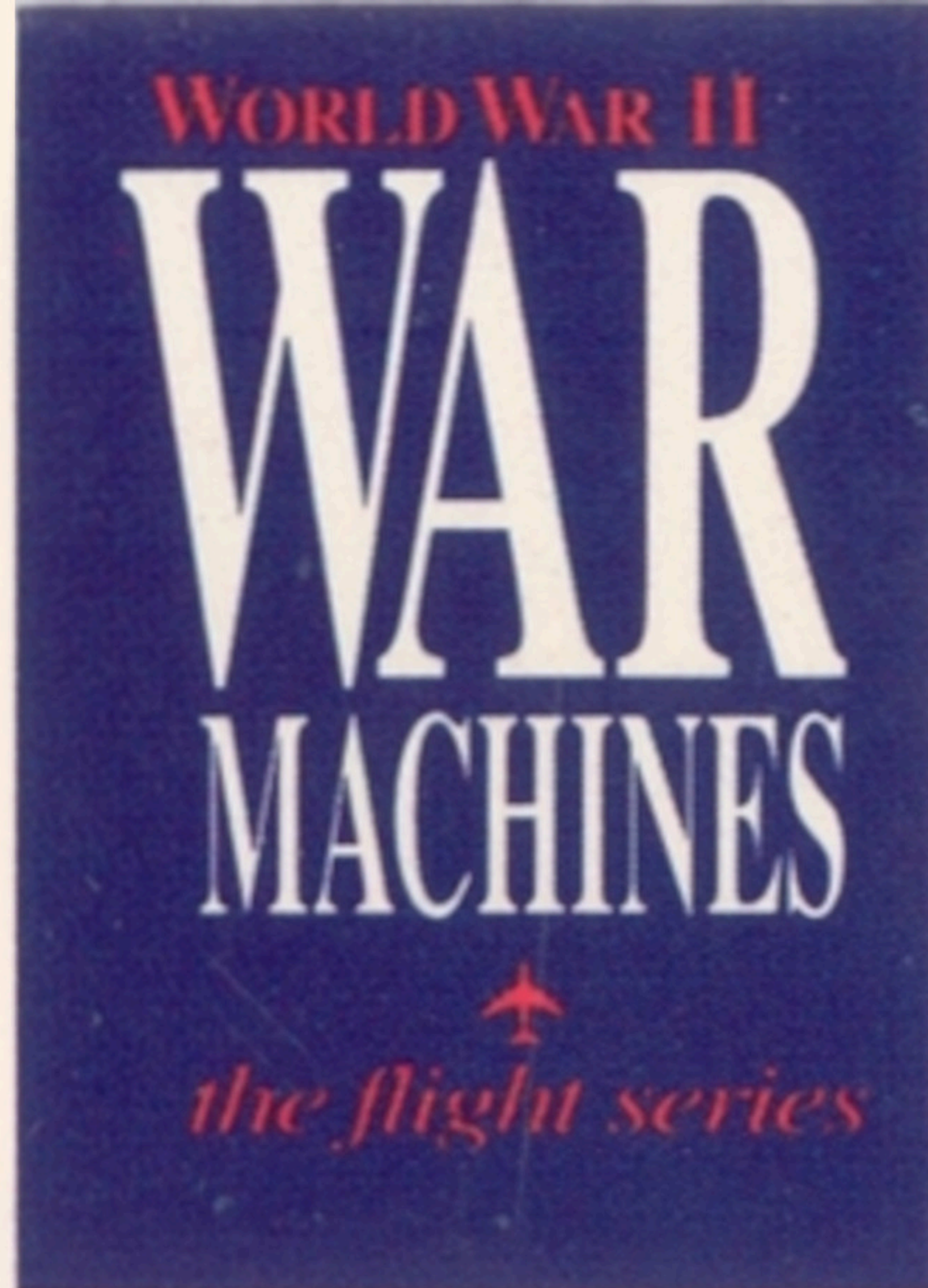
Dimensions:

Wing span 46 ft. 3 in., Length
41 ft. 5 in., Height 14 ft. 1 in.

Ceiling:

Approximately 32,810 ft.

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