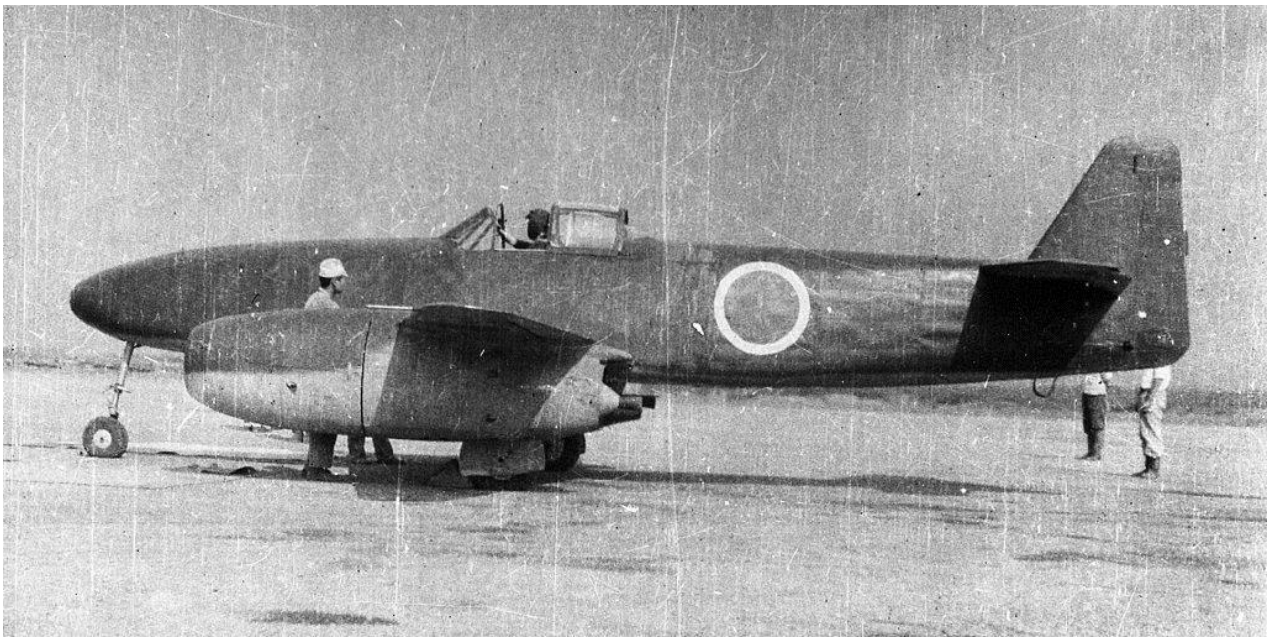
NAKAJIMA J9N KIKKA



L'attaché naval japonais en poste à Berlin, qui avait assisté à des vols de démonstration du biréacteur Messerschmitt Me-262 A Schwalbe, transmit un rapport enthousiaste à l'état-major de Tokyo en septembre 1944. Rapport si convaincant qu'il incita le haut commandement de la Marine Impériale à se doter d'un appareil de type similaire. En un peu moins d'un an, les ingénieurs Kazuo Ohno et Kenichi Matsumura, de la firme Nakajima, étudièrent et mirent au point un premier prototype qui fut codé **J9N** et surnommé **Kikka** (*fleur d'oranger*). Bien que très inspiré de son modèle allemand et y ressemblant donc beaucoup, l'appareil n'était toutefois pas une copie, mais bien un produit purement japonais, dans sa conception comme dans sa réalisation. La mise au point des réacteurs Ne 20 rencontra des difficultés, et il fallut pour finir avoir recours à des photos de BMW 003 adressées par l'Allemagne. La poussée délivrée par les moteurs était assez faible et, comparé au Me-262, le **Kikka** était plus petit et plus léger. C'était cependant un monoplace à deux réacteurs en nacelles sous la voilure, entièrement métallique, avec un train d'atterrissage tricycle escamotable. Ses ailes pouvaient se replier à l'instar des avions embarqués, de façon à pouvoir l'abriter facilement dans des hangars bétonnés, des grottes ou des tunnels.

En tant que bombardier rapide, il pouvait emporter 500 Kg de bombes mais ne possédait pas d'armement ; différentes versions étaient en projet : intercepteur avec deux canons de 30 mm, biplace d'entraînement et avion-suicide avec une bombe de 800 Kg. Le premier vol du **Nakajima J9N Kikka** eut lieu le 7 août 1945 sur l'aérodrome naval de Kisarazu, piloté par le commandant Susumu Tanaoka. Le cahier des charges exigeait que l'appareil quitte le sol en moins de 400 mètres et, pour pallier au manque de puissance des réacteurs, des fusées à poudre d'assistance au décollage (*RATO*), largables, étaient fixées sous la voilure, au raccord du fuselage. Le 11 août 1945, ces fusées d'appoint, disposées sous un mauvais angle, firent rater le deuxième décollage et l'avion fut détruit dans l'accident qui s'ensuivit. Quand le Japon capitula quatre jours plus tard, le prototype n°2 était pratiquement fini, 18 appareils de présérie étaient en cours de montage à divers degrés d'avancement et un successeur plus gros et plus puissant (*Ki 201 Karyu*) était déjà à l'étude.

Source : https://www.avionslegendaires.net/avion-militaire/nakajima-kikka/

Version anglaise wikipedia

The **Nakajima *Kikka*** (橘花, *"tachibana orange blossom"*) was Japan's first turbojet-powered aircraft. It was developed late in World War II and the first prototype had only flown once before the end of the conflict. It was initially called **Kōkoku Nigō Heiki** (皇国二号兵器, *"Imperial Weapon No. 2"*).

Design and development

After the Japanese military attaché in Germany witnessed trials of the Messerschmitt Me 262 in 1942,[1] the Imperial Japanese Navy issued a request to Nakajima to develop a similar aircraft to be used as a fast attack aircraft. Among the specifications for the design were the requirements that it should be able to be built largely by unskilled labor, and that the wings should be foldable. This latter feature was to enable the aircraft to be hidden in caves and tunnels around Japan as the navy began to prepare for the defense of the home islands. Nakajima designers Kenichi Matsumura and Kazuo Ohno laid out an aircraft that bore a strong but superficial resemblance to the Me 262.[2] The *Kikka* was designed in preliminary form to use the Tsu-11, a rudimentary motorjet style jet engine that was essentially a ducted fan with an afterburner. Subsequent designs were planned around the Ne-10 (TR-10) centrifugal-flow turbojet, and the Ne-12, which added a four-stage axial compressor to the front of the Ne-10. Tests of this powerplant soon revealed that it would not produce anywhere near the power required to propel the aircraft, and the project was temporarily stalled. It was then decided to produce a new axial flow turbojet based on the German BMW 003.[2] Development of the engine was troubled, as it was based on little more than photographs and a single cut-away drawing of the BMW 003; however, a suitable unit, the Ishikawajima Ne-20, was quickly built in 1945. By mid-1945, the *Kikka* project was making progress once again and at this stage, due to the deteriorating war situation, it is possible that the Navy considered employing the *Kikka* as a *kamikaze* weapon, although this prospect was questionable due to the high cost and complexity associated with manufacturing contemporary turbojet engines. Other more economical projects designed specifically for *kamikaze* attacks, such as the simpler Nakajima Tōka (designed to absorb Japanese stock of obsolete engines), the pulsejet-powered Kawanishi Baika, and the better-known Yokosuka Ohka, were either underway or already in mass production. Compared to the Me 262, the *Kikka* airframe was noticeably smaller and more conventional in design, with straight wings (lacking the slight sweepback of the Me 262) and tail surfaces.[2] The triangular fuselage cross section characteristic of the German design was less pronounced, due to smaller fuel tanks. The main landing gear of the *Kikka* was taken from the A6M Zero and the nose wheel from the tail of a Yokosuka P1Y bomber.

Designation

The *Kikka* is often identified as the **J9N1**, or occasionally **J9Y1**, which according to a researcher at the National Air and Space Museum is incorrect.[3] The official name given to the aircraft was 橘花 "Kikka." Like other Japanese aircraft intended for use in suicide missions, it received only a name. Imperial Japanese Naval aircraft were designated similar to U.S. Naval aircraft of the time frame. A first letter, denoting the role/type of aircraft, separated by a number that denotes where in the series of aircraft of the same role the aircraft resides, followed by a second letter denoting the design and manufacturing firm, and finally, a second number denoting the aircraft subtype. The first three characters remain constant through all the sub-variants an aircraft might be built to.[4]

Operational history

The Nakajima *Kikka*, equipped with RATO rockets for lift off

The first prototype commenced ground tests at the Nakajima factory on 30 June 1945. The following month it was dismantled and delivered to Kisarazu Naval Airfield where it was re-assembled and prepared for flight testing. The first flight took place on 7 August 1945 (the day after Hiroshima was bombed by atomic bomb), with Lieutenant Commander Susumu Takaoka at the controls. The aircraft performed well during a 20-minute test flight, with the only concern being the length of the takeoff run. For the second test flight, four days later (4 days prior to Japan's declaration of surrender), rocket assisted take off (RATO) units were fitted to the aircraft. The pilot had been uneasy about the angle at which the rocket tubes had been set, but with no time to correct them they decided to simply reduce the thrust of the rockets from 800 kg to only 400 kg. Four seconds into take off the RATO was actuated, immediately jolting the aircraft back onto its tail leaving the pilot with no effective tail control. After the nine-second burning time of the RATO ran out the nose came down and the nose wheel contacted the runway, resulting in a sudden deceleration, however both engines were still functioning normally. At this point the pilot opted to abort the take off, but fighting to brake the aircraft and perform a ground loop only put him in danger of running it into other installations. Eventually the aircraft ran over a drainage ditch which caught the tricycle landing gear, the aircraft continued to skid forward and stopped short of the water's edge.[5] Before it could be repaired Japan had surrendered and the war was over. At this point, the second prototype was close to completion, and approximately 23 more airframes were under construction.[1] Five of these were two-seat trainers.[6]

Postwar

A Kikka stationed at the Patuxent River Naval Air Base, Maryland, 1946

Nakajima Kikka in the Steven F. Udvar-Hazy Center

After the war, airframes 3, 4, and 5 (and possibly other partial airframes) were brought to the U.S. for study. Today, two examples survive in the National Air and Space Museum: The first is a *Kikka* that was taken to the Patuxent River Naval Air Base, Maryland for analysis. This aircraft is very incomplete and is believed to have been patched together from a variety of semi-completed airframes. It is currently still in storage at the Paul E. Garber Preservation, Restoration and Storage Facility in Silver Hill, Maryland. The second Kikka is on display at the NASM Udvar-Hazy Center in the Mary Baker Engen Restoration Hangar. Correspondence in 2001 with Japanese propulsion specialist Kazuhiko Ishizawa theorized that Nakajima constructed the Museum's Kikka airframe for load testing, not for flight tests. This may explain why the engine nacelles previously fitted on the Museum's Kikka airframe are too small to enclose the Ne-20 engines.[1] However, Ishizawa later stated that a limited survey at the Paul E. Garber facility concluded that this Kikka may not be a strength-tester due to the presence of wiring, hydraulics and controls.[7] Furthermore, Susumu Watanabe, who was in charge of engine outfitting for the Kikka, recalled that the engine nacelles of the strength tester were the same as the standard aircraft, and that the strength tester was stressed until failure.[8] Based on this information, the mock nacelles were potentially added for display purposes after transit to the United States. Two Ne-20 jet engines had been taken to the US and sent for analysis to the Chrysler Corporation in 1946. This was only revealed in 2005 by W. I. Chapman, who was in charge of the project at the time. A working engine was assembled with the parts of the two Ne-20s, and tested for 11 hours and 46 minutes. A report was issued on 7 April 1947, titled "Japanese NE-20 turbo jet engine. Construction and performance". The document is now on display at the Tokyo National Science Museum.

Variants

Five of the planes under construction at the end of the war were to be completed as two-seat trainers.[6] Other follow-on versions proposed included a reconnaissance aircraft, and a fighter armed with two 30 mm Type 5 cannons with 50 rounds per gun. The fighter was expected to be powered by a more advanced development of the Ne-20, known as *Ne-20 Kai* 6.37 kN (650 kgf), which was planned to have approximately 30% more thrust than the Ne-20.[9]

Specifications (Kikka)

Ne-20 engine taken from the second *Kikka* prototype on display at the Steven F. Udvar-Hazy Center in Chantilly, Virginia

General characteristics

- **Crew:** 1
- **Length:** 9.25 m (30 ft 4 in)
- **Wingspan:** 10 m (32 ft 10 in)
- **Height:** 3.05 m (10 ft 0 in)
- **Wing area:** 13.2 m^2 (142 sq ft)
- **Airfoil:** K125 at root, K309 at tip
- **Empty weight:** 2,300 kg (5,071 lb)
- **Gross weight:** 3,550 kg (7,826 lb)
- **Max takeoff weight:** 4,312 kg (9,506 lb)
- **Powerplant:** 2 × Ishikawajima Ne-20 axial-flow turbojet engines, 4.66 kN (1,047 lbf) thrust each

Performance

- **Maximum speed:** 696 km/h (432 mph, 376 kn) at 10,000 m (32,808 ft)
- **Range:** 948 km (589 mi, 512 nmi)
- **Service ceiling:** 12,000 m (39,000 ft)
- **Time to altitude:** 6,000 m (19,685 ft) in 12 minutes with bomb load
- **Wing loading:** 269 kg/m^2 (55 lb/sq ft)
- **Thrust/weight:** 0.27

Armament

- **Bombs:** 1 × 500 kg (1,102 lb), or 1 × 800 kg (1,764 lb) bomb

Source : https://en.wikipedia.org/wiki/Nakajima_Kikka