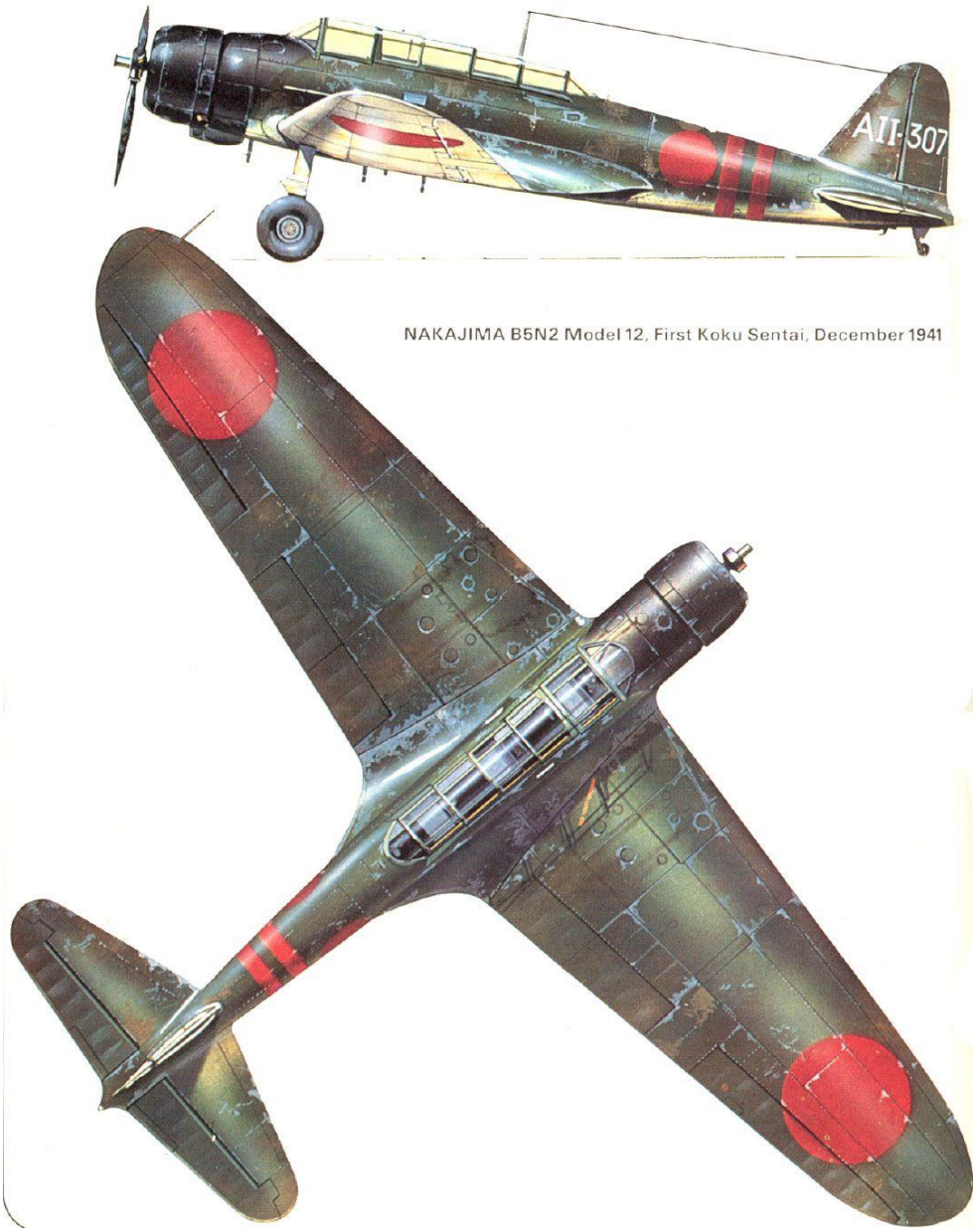
Nakajima B6N

Le Nakajima B6N Tenzan ("Montagne merveilleuse", code allié : Jill) fut le bombardier torpilleur standard de la Marine impériale japonaise pendant les dernières années de la Seconde Guerre mondiale. Successeur du B5N, le B6N Tenzan en fut un excellent remplaçant et 1268 exemplaires furent produits. Le prototype de ce grand monomoteur apparut au printemps 1941, le développement de l'avion fut retardé par des problèmes moteurs, de stabilité et du train d'atterrissage et les premiers exemplaires ne furent utilisés en opération qu'en 1943. Appareil équipé du moteur Nakajima Mamoru 11. Ce moteur ne donna pas vraiment satisfaction et la Marine exigea l'arrêt de sa production pour se concentrer sur les moteurs Homare et Sakae.

Les débuts en combat du B6N1 furent désastreux. La bataille de la mer des philippine les eus en opération dans un environnement où les États-Unis ont une telle supériorité aérienne que ceux-ci n'infligèrent pas de dégâts significatifs, tout en ayant des pertes massives en combattant face au Hellcat F6F de la marine américaine. De nouveau, après cette débâcle, la marine a commandé plusieurs changements de conception, spécialement le remplacement du moteur de NK7A Mamoru 11 par le Mitsubishi MK4T Kasei 25, ayant pour résultat le B6N2. Quand le nouveau modèle est devenu disponible au milieu de l'année 1944, il avait déjà perdu la plupart de ses porte-avions, et souffrait désespérément de pilotes expérimentés. La grande majorité des opérations du B6N2 eurent donc lieu a partir des bases a terre, et ne rencontrèrent aucun succès important. Il a été intensivement employé dans la bataille d'Okinawa, où ils ont été également employés pour des missions kamikaze pour la première fois.

Nakajima B6N :

- Moteur Mitsubishi MK4T Kasei
- 1850 Ch
- 480 Km/h
- 1 Mitrailleuse 13 mm et 1 de 7.7 mm 800 kg de bombes ou 1 torpille de 800 Kg
- 5650 Kg en charge
- 8650 m de plafond pratique
- 3045 Km en distance franchissable
- 3 Equipiers



Source : http://les-avions-de-legende.e-monsite.com/pages/les-bombardiers/les-bombardiers-japonais/nakajima-b6n.html

Version anglaise wikipédia

The **Nakajima B6N *Tenzan*** (Japanese: **中島 B6N 天山**, "Heavenly Mountain", Allied reporting name: "**Jill**") was the Imperial Japanese Navy's standard carrier-borne torpedo bomber during the final years of World War II and the successor to the B5N "Kate". Due to its protracted development, a shortage of experienced pilots and the United States Navy's achievement of air superiority by the time of its introduction, the B6N was never able to fully demonstrate its combat potential.

Design and development

A B6N2 before starting the engine.

The B5N carrier torpedo-bomber's weaknesses had shown themselves early in the Second Sino-Japanese War and, as well as updating that aircraft, the Imperial Japanese Navy began seeking a faster longer-ranged replacement. In December 1939 it issued a specification to Nakajima for a Navy Experimental *14-Shi* Carrier Attack Aircraft capable of carrying the same external weapons load as the B5N. The new plane was to carry a crew of three (pilot, navigator/bombardier and radio operator/gunner) and be of low wing, cantilevered, all-metal construction (though control surfaces were fabric-covered). Further requirements included a top speed of 250 knots (460 km/h; 290 mph), a cruising speed of 200 knots (370 km/h; 230 mph) and a range of 1,000 nmi (1,900 km; 1,200 mi) with an 800 kg (1,800 lb) bomb load or 2,072 nmi (3,837 km; 2,384 mi) without external armament.[1] The Navy had requested installation of the proven Mitsubishi *Kasei* engine as the B6N's powerplant but Engineer Kenichi Matsumara insisted on using Nakajima's new 1,870 hp (1,390 kW) *Mamoru* 11 14-cylinder air-cooled radial due to its lower fuel consumption and greater adaptability. This became an unfortunate choice as the Mamoru engine was plagued with mechanical defects and never achieved its expected power rating.[2] Constrained by the standard-sized aircraft elevators then in use on most Japanese carriers, designer Matsumara was obliged to use a wing similar in span and area as that of the B5N and to limit the aircraft's overall length to 11 m (36 ft). This latter restriction accounted for the B6N's distinctive swept-forward tail fin and rudder. The outer wing panels folded upward hydraulically, reducing the B6N's overall span from 14.9 m (49 ft) to approximately 6.3 m (21 ft) for minimal carrier stowage. In order to lessen increased wingloading due to the heavier powerplant, Fowler flaps were installed which could be extended beyond the wing's trailing edge. These were normally lowered to an angle of 20 degrees during take-off and 38 degrees when landing. Despite the use of these flaps, however, the B6N had a much higher stall speed than its predecessor.[1] The prototype B6N1 made its maiden flight on 14 March 1941.

Following continued testing, however, several problems became evident. In particular, the aircraft exhibited an alarming tendency to roll while in flight, the cause of which was traced to the extreme torque developed by the four-bladed propeller. To compensate, the aircraft's tail fin was thinned down and moved 2 degrees ten minutes to port. This modification greatly improved the plane's handling characteristics.[3] The B6N1's *Mamoru* 11 engine was found prone to severe vibrations and overheating at certain speeds and was at first judged too unreliable (an important consideration given that the plane was expected to fly long distances over open water). Following a series of modifications, though, the engine's performance was finally deemed promising enough that carrier acceptance trials were begun at the end of 1942. Subsequent test flights conducted aboard the carriers *Ryuho* and *Zuikaku* indicated the need to strengthen the tail hook mounting on the plane's fuselage. Some attempts were also made to use RATOG (rocket-assisted take-off gear) units on several B6N1s in order to qualify the aircraft for use on smaller carriers but the results were unsatisfactory.[4] The B6N1 was officially approved for production status in early 1943 and given the designation Navy Carrier Attack Aircraft *Tenzan* Model 11. Modifications based on testing of the initial prototypes included: the addition of a flexible Type 92 machine gun in a ventral tunnel at the rear of the cockpit (in addition to the standard rear-firing Type 92), and a 7.7mm Type 97 machine-gun to the port wing (the latter was eventually deleted after the seventieth production aircraft); angling the torpedo mounting rack 2 degrees downward and adding torpedo stabilization plates to prevent the torpedo from bouncing during low-altitude release; strengthening of the main landing gear.[5] A proposal by the designers to replace the B6N1's unprotected fuel tanks with self-sealing ones would have resulted in a 30% drop in fuel capacity, a loss in range the Navy decided was unacceptable.[6] After only 133 B6N1s had been produced by July 1943, the Japanese Ministry of Munitions ordered Nakajima to halt manufacture of the *Mamoru 11* engine in order that the Navy reduce the number of different engines then in use. Pending availability of the 18-cylinder Nakajima *Homare* engine, Nakajima was asked to substitute the 1,850 hp (1,380 kW) Mitsubishi MK4T *Kasei 25* engine on the B6N1 airframe, the very engine the Navy had originally requested them to use. As the *Mamoru 11* and *Kasei 25* were similar in size, installation was relatively straightforward, requiring only that the nose be extended to maintain the aircraft's center of gravity and minor alterations to the oil cooler and air intakes on the engine cowling. A smaller 3.4 m (11 ft) diameter four-bladed propeller and shorter spinner were also installed at this time, resulting in a small weight-savings, and the retractable tailwheel was fixed permanently in the down position. Finally, the single exhaust stacks on either side of the engine cowling were replaced with multiple smaller stubs to reduce glare at night and to supply a minor amount of forward thrust. The resulting modification was designated Navy Carrier Attack Aircraft *Tenzan* Model 12 or B6N2.[7] Starting in the fall of 1943, one of every three B6N2s manufactured was equipped with 3-Shiki Type 3 air-to-surface radar for detecting enemy ships. Yagi antennas were installed along the wing leading edges and also protruded from the sides of the rear fuselage.[8] A final version of the aircraft, designated B6N3 Model 13, was planned for land-based use as, by this point in the war, all of Japan's large carriers had been sunk and those few smaller ones remaining lacked catapults for launching heavier carrier-borne aircraft like the B6N. Changes included installation of a *Kasei* Model 25c engine, a more streamlined engine cowling and crew canopy, strengthening of the main landing gear, a retractable tail wheel and removal of the tail hook. Two B6N3 prototypes were completed but Japan surrendered before this variant could be put into production.[8] By war's end in August 1945, Nakajima had completed a total of 1,268 B6Ns (almost all of them B6N2s) at its plants in Okawa in the Gumma district and at Aichi in the Handa district. Production never exceeded more than 90 planes per month.[8]

Operational history

A B6N explodes after a hit by a 5-inch shell from USS *Yorktown* as it attempts an unsuccessful attack on the carrier off Kwajalein on 4 December 1943. The B6N *Tenzan* began reaching front-line units in August 1943 in small numbers. The intent was to gradually replace all of the B5N *Kate* torpedo bombers then operating aboard the carriers of the Third Fleet at Truk Atoll in the Caroline Islands. However, the B6Ns were prematurely committed to battle when increased Allied naval activity in the Solomon Islands indicated a likely invasion at Bougainville. In response to this threat, the IJN initiated Operation Ro. This involved reinforcing land-based air units at Rabaul with 173 carrier aircraft from First Carrier Division (*Zuikaku*, *Shokaku* and *Zuiho*), including forty B6Ns. These aircraft were flown from Truk to Rabaul between 28 October and 1 November.

On 5 November fourteen B6N1s, escorted by four A6M Zero fighters, were sent to attack American shipping anchored off Bougainville. Four B6N1s were lost and no hits were scored, returning Japanese pilots claimed to have sunk one large and one medium carrier, two heavy cruisers and two other cruisers or large destroyers.[9] Additional attacks on 8 November and 11 November, suffered heavy losses, with only 52 of the original 173 planes from the First Carrier Division making it back to Truk on 13 November, among them, just six B6N1 *Tenzan*'s out of the forty committed.[10]

B6N torpedo bomber attacking TG 38.3 during the Formosa Air Battle, October 1944

On 19 June 1944, the B6N made its carrier-borne combat debut at The Battle of the Philippine Sea, operating in an environment where the U.S. Navy had virtually complete air superiority. Subsequently, it failed to inflict any damage whilst taking heavy losses from the U.S. Navy's new F6F Hellcat fighter.

By this point, small improvements in the B6N's performance were amongst the least of the Japanese Navy's problems. When the new model became available in mid-1944, Japan had already lost most of its large carriers and became desperately short of experienced pilots. Therefore, the vast majority of B6N2 operations took place from land bases and failed to achieve any major successes. The planes were extensively used in the Battle of Okinawa where they were also used for kamikaze missions for the first time.[11]

Specifications (Nakajima B6N2)

General characteristics

- **Crew:** 3
- **Length:** 10.865 m (35 ft 8 in)
- **Wingspan:** 14.894 m (48 ft 10 in)
- **Height:** 3.8 m (12 ft 6 in)
- **Wing area:** 37.2 m^2 (400 sq ft)
- **Airfoil: root:** K121; **tip:** K119[17]
- **Empty weight:** 3,010 kg (6,636 lb)
- **Gross weight:** 5,200 kg (11,464 lb)
- **Max takeoff weight:** 5,650 kg (12,456 lb)
- **Powerplant:** 1 × Mitsubishi MK4T Kasei 25 14-cylinder air-cooled radial piston engine, 1,380 kW (1,850 hp) for take-off

  1,253 kW (1,680 hp) at 2,100 m (6,900 ft)

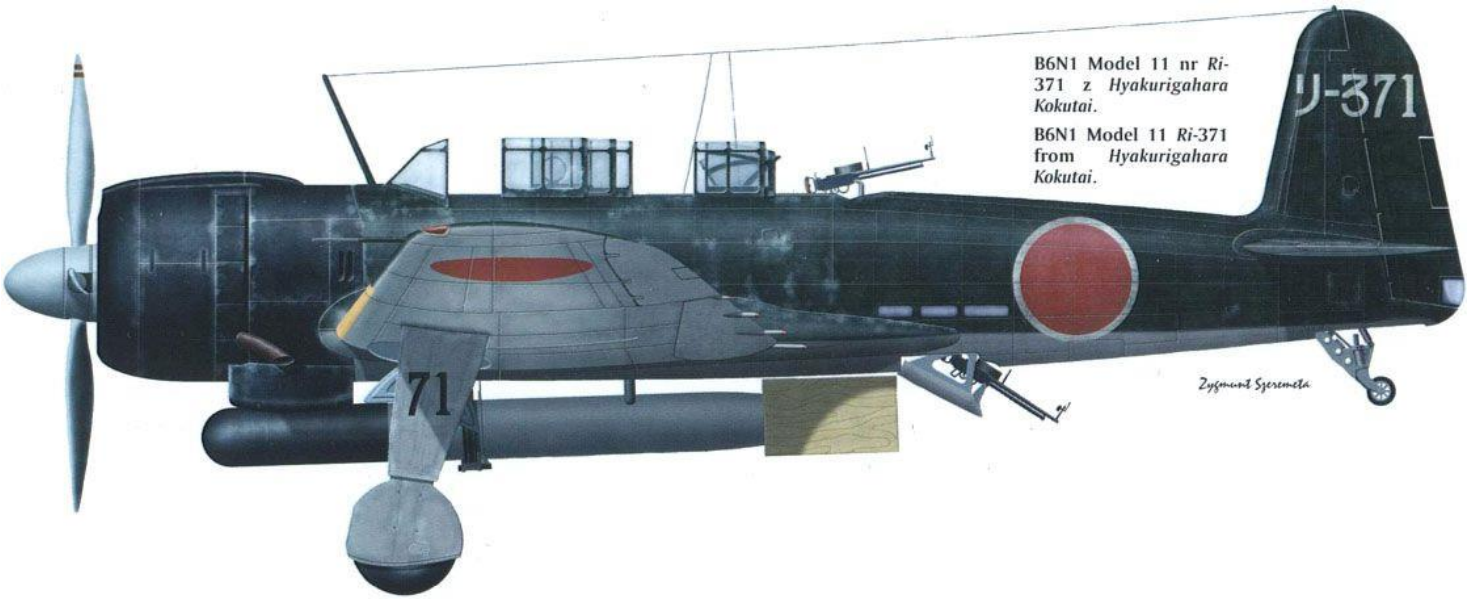
  1,148 kW (1,540 hp) at 5,500 m (18,000 ft)
- **Propellers:** 4-bladed constant-speed propeller

Performance

- **Maximum speed:** 482 km/h (300 mph, 260 kn) at 4,900 m (16,100 ft)
- **Cruise speed:** 333 km/h (207 mph, 180 kn) at 5,500 m (18,000 ft)
- **Range:** 1,746 km (1,085 mi, 943 nmi)
- **Ferry range:** 3,045 km (1,892 mi, 1,644 nmi)
- **Service ceiling:** 9,040 m (29,660 ft)
- **Time to altitude:** 5,000 m (16,000 ft) in 10 minutes 24 seconds
- **Wing loading:** 139.8 kg/m^2 (28.6 lb/sq ft)
- **Power/mass:** 0.2652 kW/kg (0.1613 hp/lb)

Armament

- **Guns:** 1 × 7.7 mm (0.303 in) Type 92 machine gun in rear cockpit and 1 × 7.7 mm (0.303 in) Type 92 firing through ventral tunnel
- **Bombs:** 1 × 800 kg torpedo *or* 800 kg (1,760 lb) of bombs (1 x 800 kg or 500 kg, or 2 × 250 kg)



Source : https://en.wikipedia.org/wiki/Nakajima_B6N