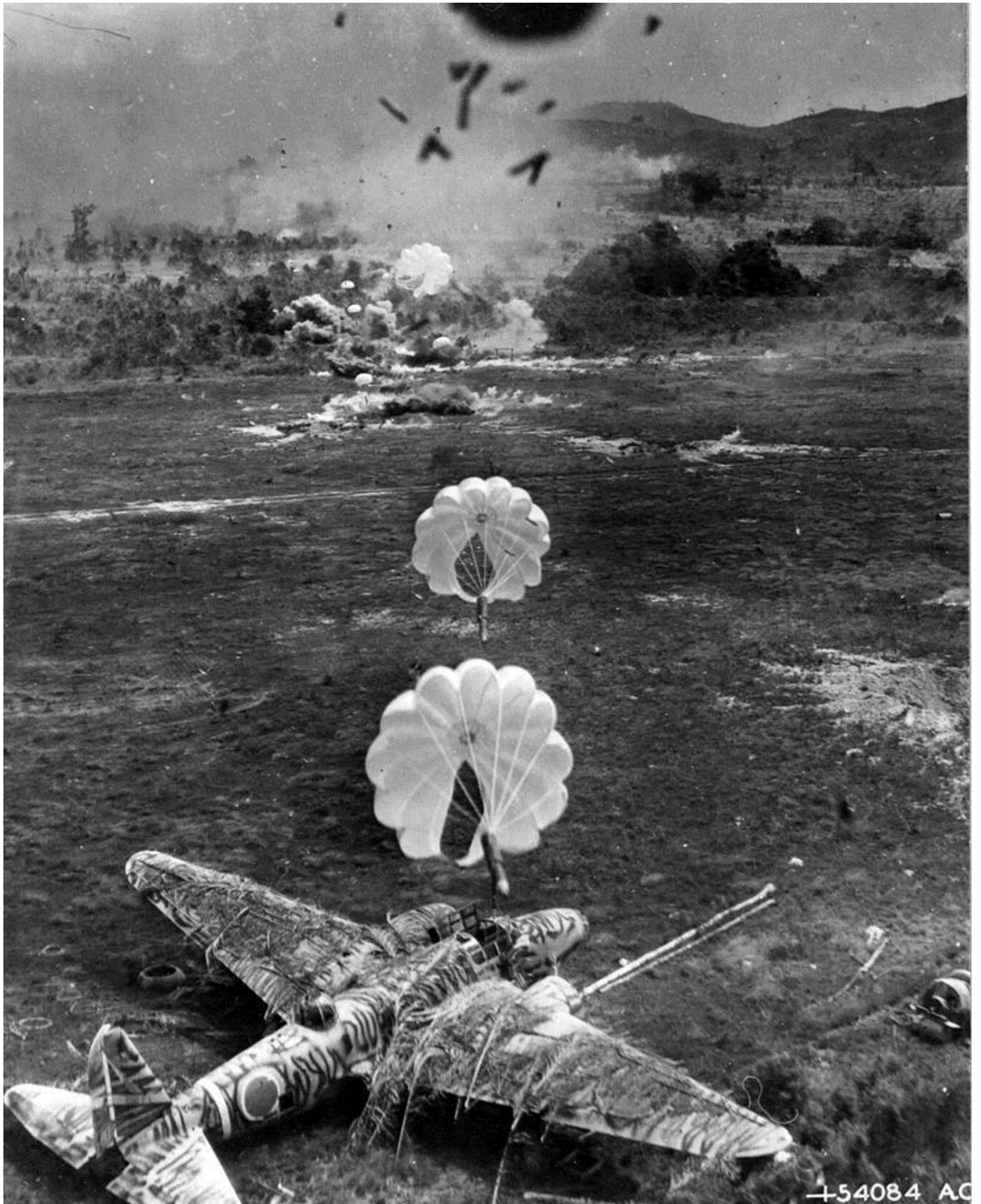


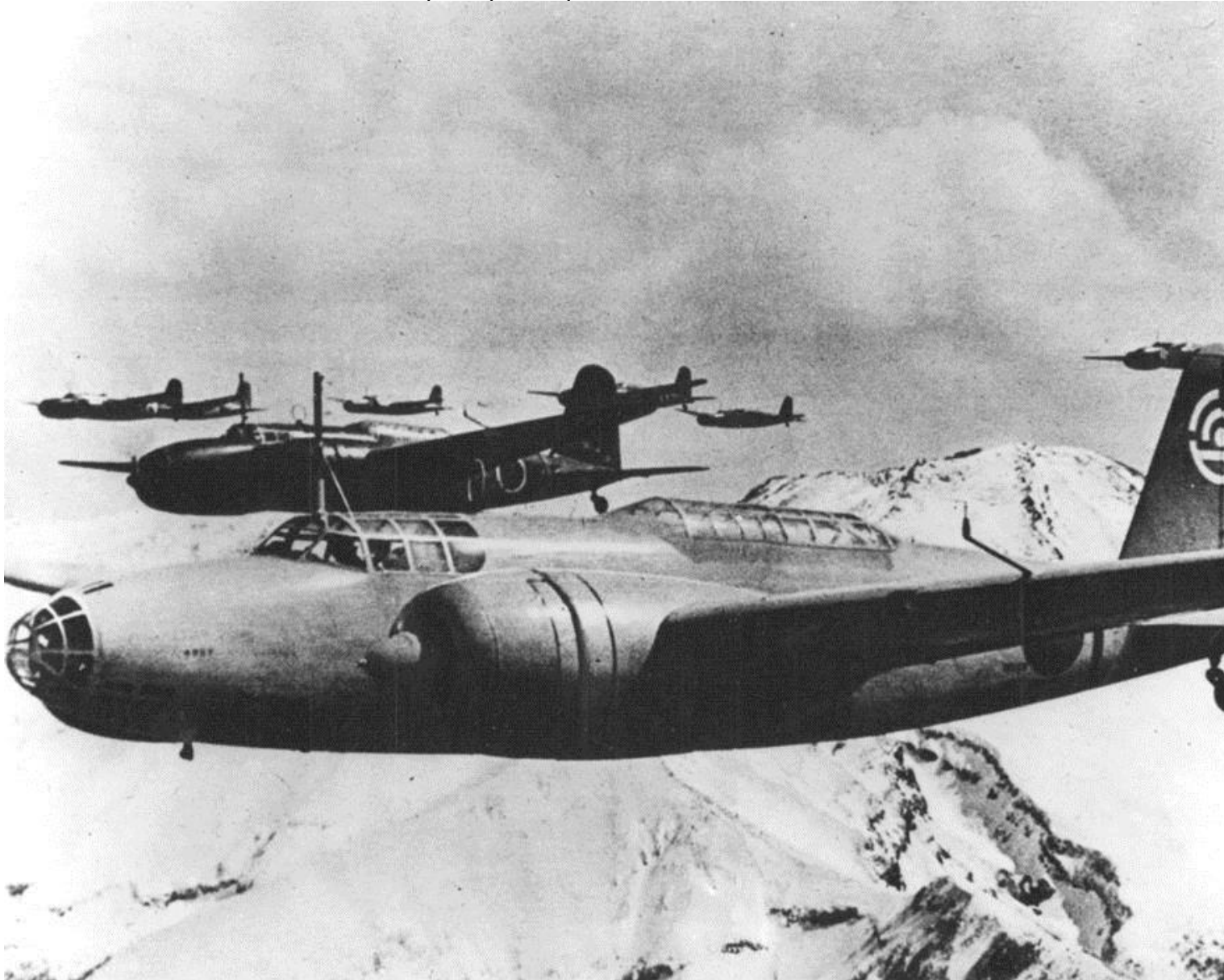
## Mitsubishi Ki-21 Sally



[Mitsubishi Ki-21-IIb Sally bombardé](#)

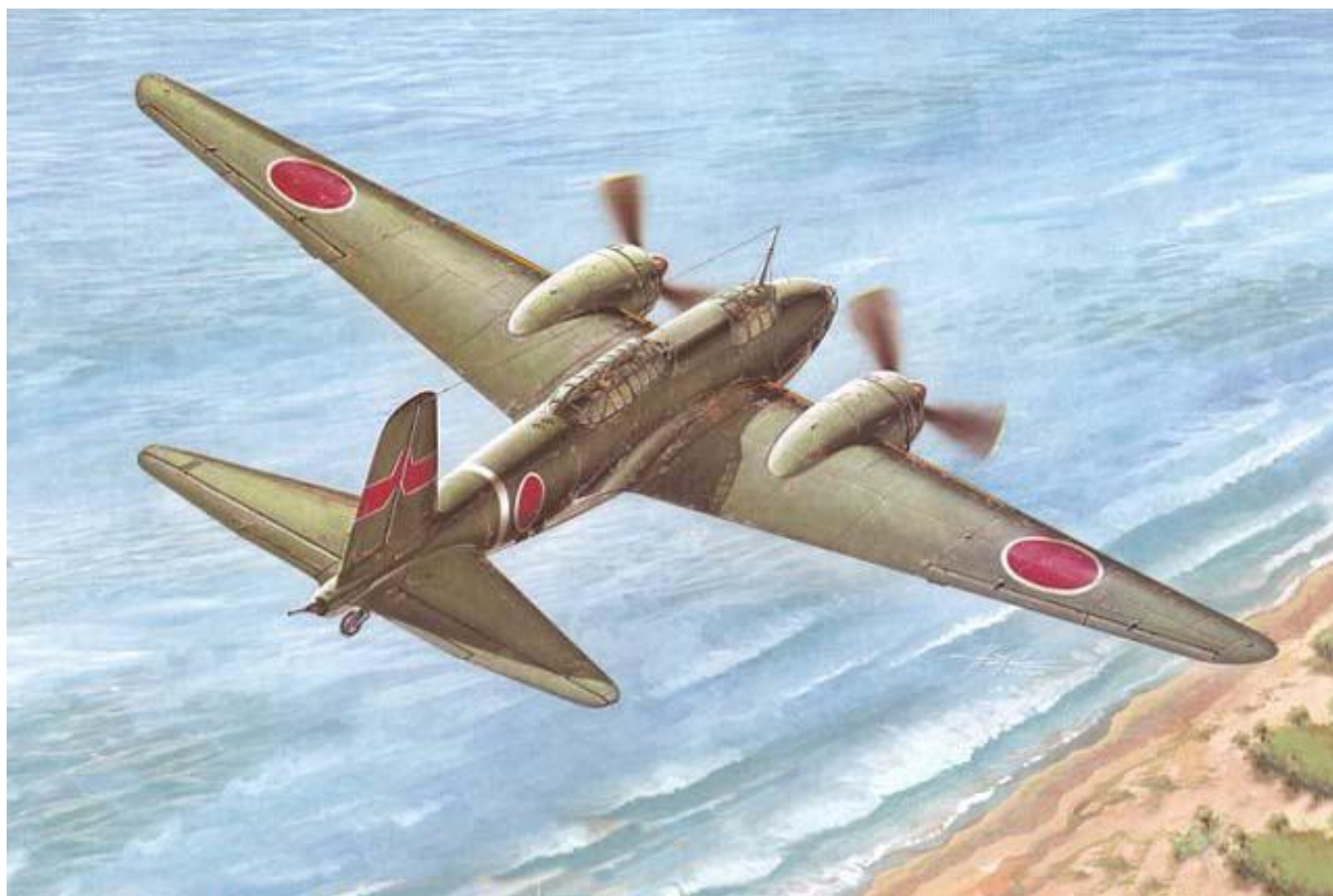
Au milieu des années 1930, les unités de bombardement de l'aviation de l'armée impériale japonaise étaient équipées d'appareils clairement dépassés, les Mitsubishi Ki-1 et Ki-20 (tous deux élaborés sur la base de modèles réalisés par le constructeur allemand Junkers).

Dans le même temps, la marine impériale commençait à se doter du tout nouveau Mitsubishi G3M, bien plus efficace. Pour ne pas perdre la face et accumuler du retard, l'état-major chargé de la composante aérienne de l'armée (*Kôkû-Honbu*) décida en février 1936 de remplacer ses anciens appareils. Les spécifications exigées étaient très ambitieuses. Le nouveau bombardier devait pouvoir évoluer à 400 km/h à une altitude de 3 000 mètres, tout en emportant une tonne de charge militaire et un puissant armement défensif, le tout avec une autonomie supérieure à cinq heures de vol. Trois constructeurs furent contactés. Si le Kawasaki Ki-22 disparut rapidement des écrans, les deux autres prototypes proposés par Mitsubishi et Nakajima suscitèrent rapidement l'intérêt des autorités. Le premier Mitsubishi Ki-21 décolla le 18 décembre 1936, rapidement suivi par un deuxième exemplaire presque identique (à l'exception de son poste de tir dorsal, une tourelle sphérique plutôt qu'une verrière tout en longueur). Il répondait entièrement aux exigences de l'armée, mais dut faire face à la concurrence du Nakajima Ki-19. Ce dernier, légèrement moins performant, était cependant beaucoup plus fiable et son comportement en vol était meilleur. Mitsubishi revit alors sa copie, construisant six autres prototypes et reprenant le nez vitré et les moteurs Ha-5 de son adversaire. Ces changements s'avèrent payants. En novembre 1937, l'armée choisit le Ki-21, officiellement désigné bombardier lourd de l'Armée type 97. Le Ki-21 de première génération, ou Ki-21-I *Kô* (modèle IA) était un bombardier monoplane de construction entièrement métallique. Sa voilure cantilever était implantée en position médiane. Les postes d'équipage étaient largement vitrés, offrant une bonne visibilité aux cinq hommes d'équipage. Le train d'atterrissage comprenait deux jambes de train s'encastrant presque totalement dans les deux nacelles des moteurs, plus une roulette de queue non escamotable. Les deux moteurs étaient des Nakajima Ha-5 *Kaï*, d'une puissance unitaire de 850 ch (1 000 ch au décollage), chacun entraînant une hélice métallique tripale à pas variable.



[Mitsubishi Ki-21 Sally en formation](#)

Les défenses de l'avion étaient minimales, comme pour beaucoup de bombardiers japonais. Il n'y avait ni blindage, ni réservoirs auto-obturants. L'armement embarqué était réduit à deux mitrailleuses jumelées de calibre 7,7 mm dans le poste de tir dorsal (dans la verrière située entre le poste de pilotage et la dérive arrière) et à deux mitrailleuses simples de même calibre dans des postes de tir avant et ventral. Ce manque d'armement fut rapidement signalé. La charge de 1 000 kilos de bombes était quant à elle placée dans une soute à bombes ventrale. La production en série démarra véritablement en 1938 dans les usines Mitsubishi et Nakajima. Les premiers appareils disponibles furent engagés en Chine à l'été 1938, où ils furent bien accueillis par les équipages de l'armée. Les premiers rapports sur l'engagement de ces avions permirent à Mitsubishi d'apporter des modifications, notamment au niveau de l'armement. Cela allait donner naissance aux Ki-21-I Otsu et Ki-21 Hei. Les Ki-21-I furent surtout déployés en Chine, contre les forces nationalistes. Ils furent initialement engagés au sein des 60<sup>e</sup> et 61<sup>e</sup> *Hikô-Sentai*. L'expérience démontra que ces avions nécessitaient une escorte de chasse ou la maîtrise du ciel, leur armement et leur protection étaient insuffisants pour se défendre seuls. Mitsubishi fit donc le choix de développer une nouvelle version du Ki-21, dans l'espoir de régler ces problèmes et d'en faire un appareil véritablement efficace. La production des Ki-21-I cessa en 1941. 782 exemplaires furent construits (dont les 10 prototypes), dont 431 par Mitsubishi et 351 par Nakajima. Sur ce nombre, on comptabilisa 224 Ki-21-I *Kô*, 238 Ki-21-I *Otsu* et 310 Ki-21-I *Hei*. Tous ces appareils servirent uniquement au sein de l'armée impériale japonaise, sauf neuf exemplaires vendus à la Thaïlande. A la fin de l'année 1939, Mitsubishi se posait la question de moderniser son bombardier Ki-21 ou de lancer le développement d'un tout nouvel appareil. Finalement, pour des raisons pratiques, il fut décidé de recourir à la première solution, ce qui allait donner naissance aux Ki-21-II. Malheureusement, le Ki-21 commençait à avouer son âge et ses faiblesses. Dès la campagne de Birmanie, les pertes s'accroissent face à des chasseurs alliés de plus en plus performants et de mieux en mieux informés. Les ultimes Ki-21 opérationnels finirent leur carrière dans des missions-suicide, ou dans des raids sans retour (emport de commandos sur la base aérienne américaine de Yontan, sur l'île d'Okinawa, le 24 mai 1945). Faute de remplaçant, la production se poursuivit jusqu'en septembre 1944, uniquement chez Mitsubishi. Elle cessa après 1 282 exemplaires (Ki-21-II *Kô* et *Otsu* confondus). Au total, 2 064 exemplaires du Ki-21 furent construits. Tous reçurent le nom de code *Sally* dans l'organigramme allié.



The **Mitsubishi Ki-21**, formal designation "**Type 97 Heavy Bomber**" (九七式重爆撃機, *Kyūnana-shiki jūbakugekiki*) was a Japanese [heavy bomber](#) during [World War II](#). It began operations during the [Second Sino-Japanese War](#) participating in the [Nomonhan Incident](#), and in the first stages of the [Pacific War](#), including the [Malayan](#), [Burmese](#), [Dutch East Indies](#) and [New Guinea Campaigns](#). It was also used to attack targets as far-flung as [western China](#), [India](#) and [northern Australia](#). The [Allies](#) designated it under the [reporting names](#) "**Sally**" / "**Gwen**".

## Design and development

In 1936, the [Imperial Japanese Army Air Service](#) issued a requirement for a new heavy bomber to replace both the [Ki-20](#) (Army Type 92 Heavy Bomber) and the [Ki-1](#) (Army Type 93 Heavy Bomber).<sup>[1]</sup> The design called for a crew of at least four, top speed of 400 km/h (250 mph), endurance of at least five hours, and a bombload of 750 kg (1,650 lb). The design parameters were very ambitious, and few twin-engine bombers anywhere in the world could exceed such performance at that time.<sup>[2]</sup> Both Mitsubishi and [Nakajima](#) were asked to build two [prototypes](#) each, a further proposal from [Kawasaki](#) was rejected. The Mitsubishi design was an all-metal mid-wing [cantilever monoplane](#) with retractable [landing gear](#), ventral [bomb bay](#) and two [radial engines](#).<sup>[3]</sup> The first prototype flew on 18 December 1936, with the second prototype, which differed in replacing the dorsal turret of the first prototype with a long greenhouse canopy, following later in the month.<sup>[4]</sup> In the resulting competition Mitsubishi's Ki-21 and Nakajima's [Ki-19](#) were found to be similar, with the Ki-21 having better performance while the Nakajima design was a better bombing platform and had more reliable engines. In order to make a final decision, two further prototype were ordered from both Mitsubishi and Nakajima, with Mitsubishi instructed to change its own 615 kW (825 hp) [Mitsubishi Ha-6](#) radial engines for the [Nakajima Ha-5](#) engines used by the Nakajima design and vice versa, while the Ki-21 gained a revised glazed nose similar to that of the Ki-19 and revised tail surfaces. Thus modified, the Ki-21 proved superior and was ordered into production as the "Army Type 97 Heavy Bomber Model 1A", being ordered into production in November 1937.<sup>[5]</sup> Production aircraft began to enter service in August 1938, supplementing and then replacing the [Fiat BR.20](#) bombers which had been purchased as an interim measure.<sup>[6]</sup> Several improved versions followed (see below) before the production of the type ended in September 1944. A total of 2,064 aircraft were built, 1,713 by Mitsubishi and 351 by Nakajima.<sup>[7]</sup>

## Operational history

The **Ki-21-la** was used in combat in the [war with China](#) by the 60th *Sentai* from autumn 1938, carrying out long-range unescorted bombing missions in conjunction with the BR.20 equipped 12th and 98th *Sentais*. The Ki-21 proved to be more successful than the BR.20, having a longer range and being more robust and reliable. Two more *Sentais*, the 58th and 61st deployed to Manchuria in the summer of 1939 for operations against China, with aircraft from the 61st also being heavily used against Russian and Mongolian Forces during the [Nomonhan Incident](#) in June–July 1939.<sup>[8]</sup> Losses were high during early combat operations, with weaknesses including a lack of armament and [self-sealing fuel tanks](#), while the aircraft's oxygen system also proved unreliable. The **Ki-21-lb** was an improved version designed to address the armament issue by increasing the number of 7.7 mm (.303 in) [Type 89 machine guns](#) to five, and incorporating improvements to the horizontal tail surfaces and [trailing edge flaps](#). In addition, the bomb bay was enlarged. The tail gun was a 'stinger' installation and was remotely controlled. Also, the [fuel tanks](#) were partially protected with laminated rubber sheets.<sup>[8][9]</sup> This was followed in production by the **Ki-21-lc** with provision for a 500 L (130 US gal) auxiliary fuel tank, fitted in the rear weapons bay and one more 7.7 mm (.303 in) machine gun, bringing the total to six. Four 50 kg (110 lb) bombs were carried externally. To offset the increase in weight the main wheels of the Ki-21-lc were increased in size.<sup>[10][9]</sup> However, by the [attack on Pearl Harbor](#) and the start of the [Pacific War](#), improvements in the [ROC Air Force](#) caused losses to mount, and most Ki-21-1a, -1b and -1c were relegated to training or second-line duties. Front line units from mid-1940 were equipped with the **Ki-21-lla** ("Army Type 97 Heavy Bomber Model 2A") with the more powerful 1,118 kW (1,500 hp) [Mitsubishi Ha-101](#) air-cooled engines and larger horizontal tail surfaces. This became the main version operated by most IJAAF heavy bomber squadrons at the beginning of the Pacific War and played a major role in many early campaigns. For operations over the [Philippines](#) the JAAF's 5th, 14th and 62nd Air Groups, based in [Taiwan](#), attacked American targets at [Aparri](#), [Tuguegarao](#), [Vigan](#) and other targets in [Luzon](#) on 8 December 1941.

The 3rd, 12th, 60th, and 98th Air Groups, based in French Indochina, struck British and Australian targets in [Thailand](#) and [Malaya](#), bombing [Alor Star](#), [Sungai Petani](#) and [Butterworth](#) under escort by [Nakajima Ki-27](#) and [Ki-43](#) fighters. However, starting from operations over [Burma](#) in December 1941 and early 1942, the Ki-21 began to suffer heavy casualties from [Curtiss P-40s](#) and [Hawker Hurricanes](#). To partially compensate, the IJAAF introduced the **Ki-21-IIb**, with a pedal-operated [upper turret](#) with one 12.7 mm (0.50 in) [Type 1 machine gun](#), redesigned [cockpit canopies](#) and increased fuel capacity. Although used in all fronts in the Pacific theater, it became clear by 1942 that the design was rapidly becoming obsolete, and was increasingly shifted away from front-line service. In spite of its shortcomings, the Ki-21 remained in service until the end of the war, being utilized as transport (along with the civil transport version **MC-21**), bomber crew and [paratrooper trainer](#), for [liaison](#) and communications, special commando and secret missions, and [kamikaze](#) operations. Nine Ki-21-Ia/b's were sold by Japan to [Thailand](#) in 1940 for use by the [Royal Thai Air Force](#) against [Vichy French](#) forces in [French Indochina](#) but did not participate in the [French-Thai War](#) as its crews had not completed training.<sup>[11]</sup>



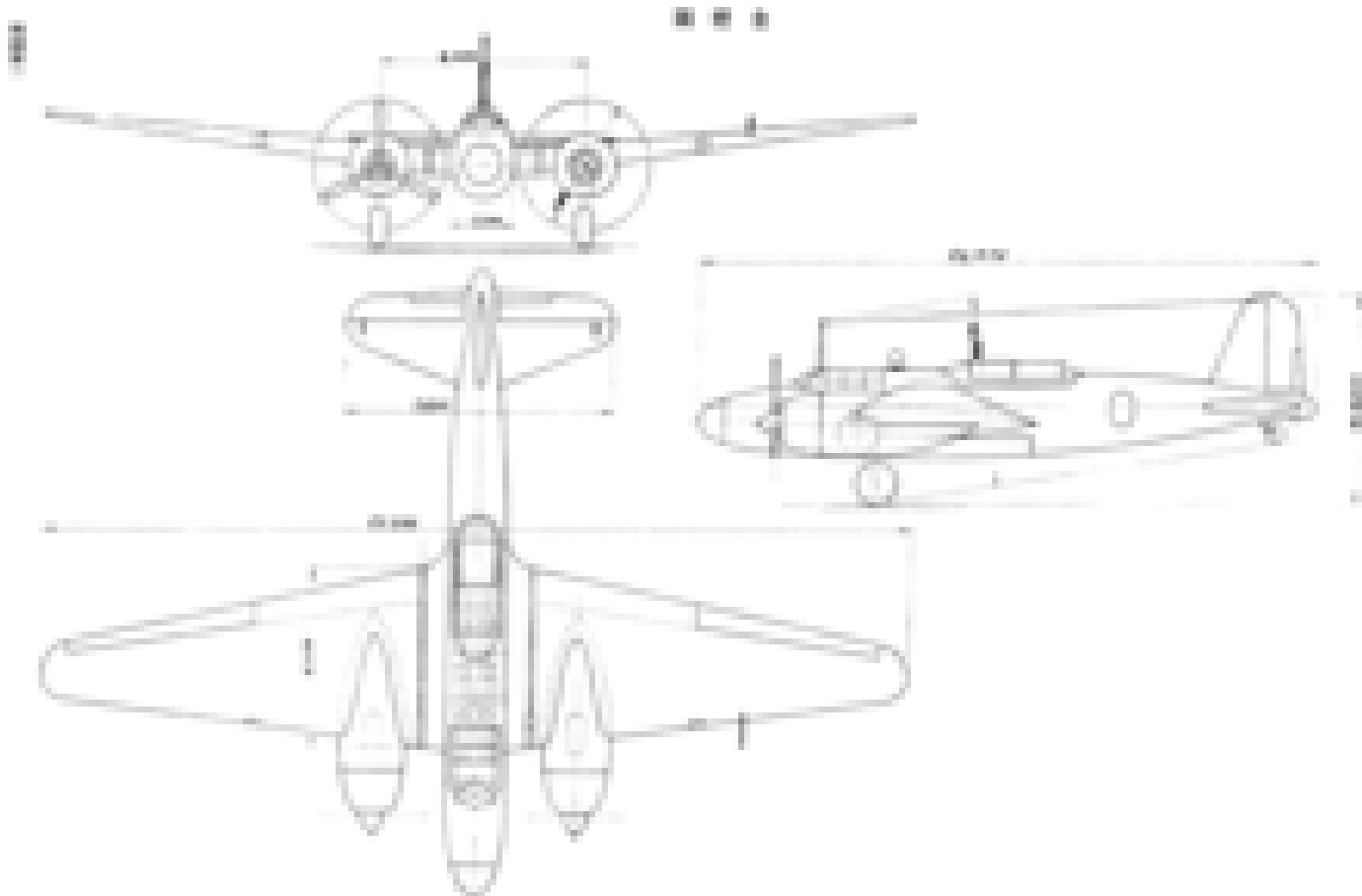
Ki-21 of the Daisan Dokuritsu [Hikōtai](#) at Yontan Airfield, 25 May 1945

Towards the end of the war, remaining Ki-21s were used by [Giretsu Special Forces](#) in strikes against American forces in [Okinawa](#) and the [Ryūkyū Islands](#). One of the noted operations was an [attack](#) on the Allied-held [Yontan airfield](#) and [Kadena airfield](#) on the night of 24 May 1945. Twelve Ki-21-IIb's of the *Daisan Dokuritsu Hikōtai* were dispatched for a strike, each with 14 [commandos](#). Five managed to crash-land on the Yontan airfield. Only one plane landed successfully. The surviving raiders, armed with [submachine guns](#) and explosives, then wrought havoc on the supplies and nearby aircraft, destroyed 70,000 US gallons (260,000 L) of fuel and nine aircraft, and damaged 26 more.<sup>[12]</sup> A number of Ki-21-Ia were modified to serve as military transports for use by [Greater Japan Airways](#), which was under contract by the Japanese Army in China for transportation. Designated "**MC-21**", these aircraft had all armament and military equipment removed. Used primarily as cargo transports, each could also seat nine paratroopers. Aircraft built from the start as transports were given the separate designation of [Mitsubishi Ki-57](#), with equivalent civil aircraft being designated MC-20.

## Code Names

The Ki-21 had more than one Allied codename. Initially called "Jane", the name was quickly changed to "Sally" when [General Douglas MacArthur](#) objected that the name was the same as that of his wife. When the Ki-21-IIb entered service, the absence of the long dorsal "greenhouse" led Allied observers to mistake it for a completely new type, which was designated "Gwen". However, when it was realized that "Gwen" was a new version of the Ki-21, it was renamed "Sally 3", with "Sally 1" referring to the earlier Ha-5 powered models, and "Sally 2" referring to the Ha-101 powered Ki-21-IIa.<sup>[13]</sup>

## Specifications (Ki-21-IIb)



3-view drawing of the Mitsubishi Ki-21

## General characteristics

- **Crew:** 5-7
- **Length:** 16 m (52 ft 6 in)
- **Wingspan:** 22.5 m (73 ft 10 in)
- **Height:** 4.85 m (15 ft 11 in)
- **Wing area:** 69.9 m<sup>2</sup> (752 sq ft)
- **Empty weight:** 6,070 kg (13,382 lb)
- **Gross weight:** 10,600 kg (23,369 lb)
- **Powerplant:** 2 × [Mitsubishi Ha101](#) 14-cylinder air-cooled radial piston engine, 1,100 kW (1,500 hp) each (long designation **Army Type 100 1,450hp Air Cooled Radial**)
- **Propellers:** 3-bladed variable-pitch propellers

## Performance

- **Maximum speed:** 485 km/h (301 mph, 262 kn)
- **Cruise speed:** 380 km/h (240 mph, 210 kn)
- **Range:** 2,700 km (1,700 mi, 1,500 nmi)

- **Service ceiling:** 10,000 m (33,000 ft)
- **Time to altitude:** 6,000 m (19,685 ft) in 13 minutes 13 seconds

### Armament

- **Guns:**
  - 5× 7.7 mm (.303 in) flexible [Type 89 machine guns](#) in nose, ventral, beam and tail positions
  - 1× 12.7 mm (.50 in) [Ho-103 machine gun](#) in dorsal turret
- **Bombs:**
  - 1,000 kg (2,200 lb) of bombs



Type 97 Model II Ki heavy bombers (Sally) of Hamamatsu Army Flight School over the Japan Alps.



Source : [https://en.wikipedia.org/wiki/Mitsubishi\\_Ki-21](https://en.wikipedia.org/wiki/Mitsubishi_Ki-21)