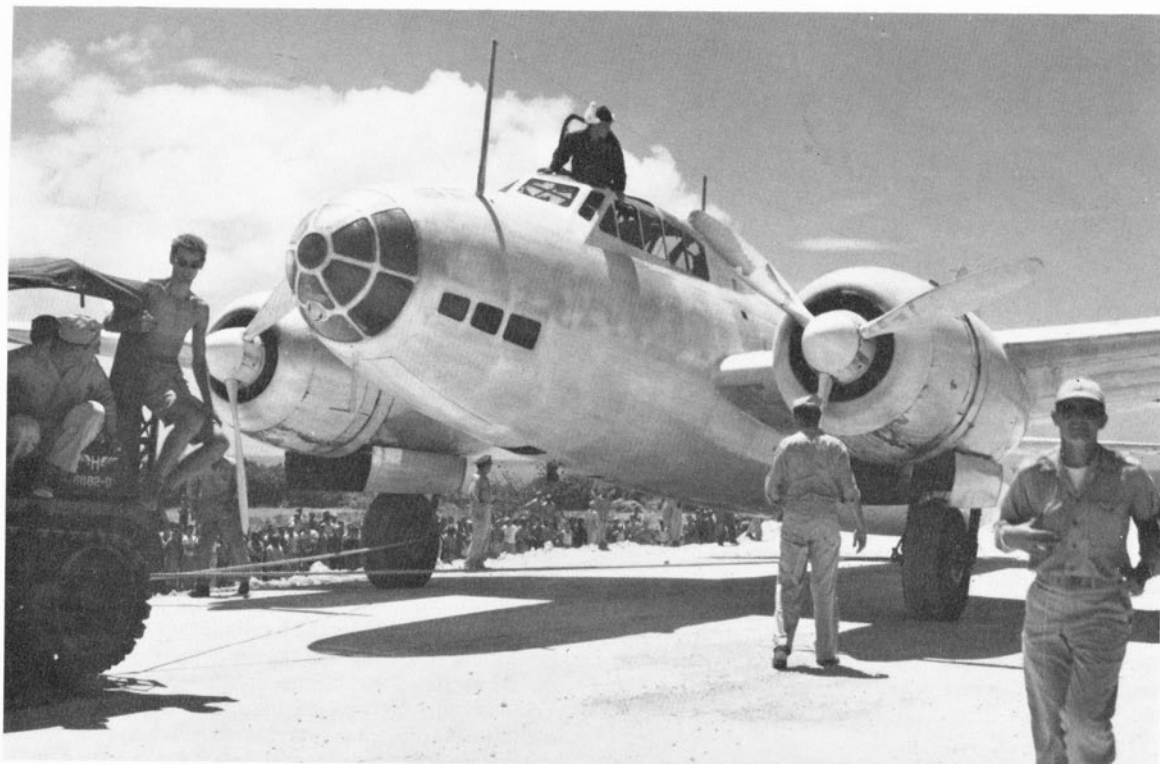


# PROFILE

# 210

## MITSUBISHI G4M 'BETTY' & OHKA BOMB





One of two Model 11s which carried the official delegation to Ie Shima on August 19, 1945, on the occasion of the historic preliminaries of surrender. This particular Navy Type 1 Attack Bomber Model 11 has been modified—to a transport rôle—with reduced side window panelling and absence of bomb aimer's transparencies. See also page 104. (Photo: U.S.A.F. archives)

## MITSUBISHI G4M "BETTY" René J. Francillon, Ph.D.

DURING the period extending from July 7, 1937—when the Second Sino-Japanese Conflict flared up—to August 15, 1945—when the dawn of the nuclear age finally led to the Japanese surrender—Japan failed to develop a four-engined heavy bomber comparable to the aircraft produced by the American and British aircraft industries. Similarly, Japan's major allies, Germany and Italy, relied primarily on twin- and three-engined medium bombers with comparatively modest range performances. Whereas these Axis bombers proved generally successful in the tactical rôle, the failure to develop a significant bombing force capable of undertaking strategic operations can be regarded as one of the most critical errors committed by the Axis Powers (see Table I).

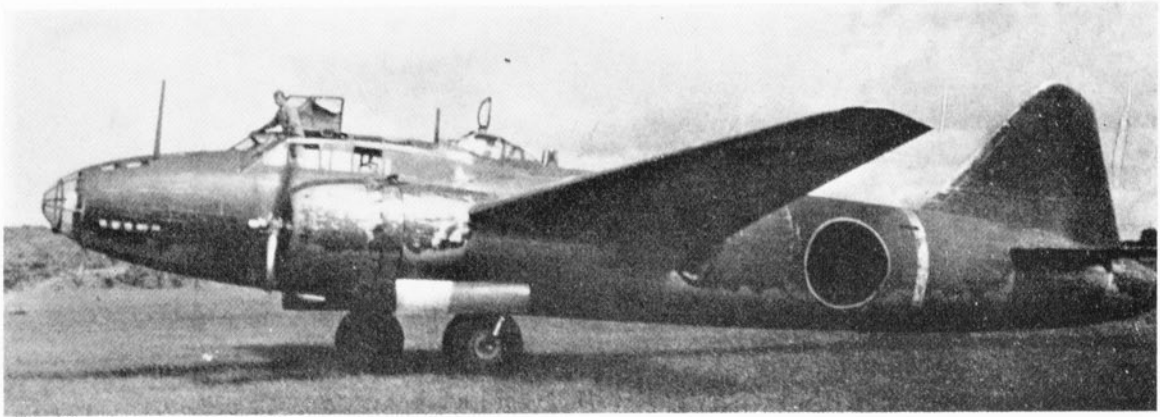
Japan, which during the Pacific War tested only two types of four-engined bombers the Nakajima G5N Shinzan and the Nakajima G8N Renzan—had to rely primarily on seven types of twin-engined bombers. Among these seven types, of which a grand total of 10,150—2,527 less than the number of Boeing B-17 Flying Fortress alone—were built between July 1935 and August 1945, one type stands out: the Mitsubishi G4M, which alone accounted for almost a quarter of all Japanese twin-engined bombers built during this period. Being the most frequently encountered Japanese bomber and having taken part in

many famous operations, the Mitsubishi G4M remains, with its contemporary the Mitsubishi A6M ("Zeke"), one of the two best-known Japanese aircraft of World War II.

Following the introduction into service of the Mitsubishi G3M ("Nell")\*, the Imperial Japanese Navy possessed at last a land-based bomber with sufficient range to operate far out at sea in support of the fleet. This tactical concept had been established by Admiral Isoroku Yamamoto who, while holding the rank of Captain, served as chief of the Technical Division of the Naval Bureau of Aeronautics and pressed for the development of long-range, land-based bombers. The Mitsubishi G3M, however, was only the first type of aircraft to meet this requirement and its comparatively rapid development led to several shortcomings in its design. In particular, as disclosed by early combat experiences in China during the second half of 1937, the G3M carried a wholly insufficient defensive armament and little hope existed for effectively correcting this deficiency. Consequently the Imperial Japanese Navy was forced into initiating the development of a replacement type for the Mitsu-

\*See Profile No.160





*This G4M1 Model 11 reveals the virtually squared-off wingtips of the original variant and also the distinctive forward-positioned radio mast. Cockpit access is also indicated. Although the upper surfaces have been camouflage painted, the under surfaces remain in natural metal finish.*  
(Photo: via René J. Francillon)

bishi G3M within less than three months of the combat début of this aeroplane and, to that effect, instructed Mitsubishi Jukogyo K.K. (Mitsubishi Heavy Industries Co. Ltd.) in September 1937 to design a land-based attack bomber meeting the requirements of their 12-Shi specification.

### THE DEVELOPMENT OF THE G4M SERIES

The Navy Experimental 12-Shi Attack Bomber specification called for a twin-engined aircraft carrying an offensive load similar to that carried by the Mitsubishi G3M—one 800 kg. (1,764 lb.) torpedo or a similar weight of bombs—but featuring a substantially heavier defensive armament. Performance requirements, including a maximum speed of 215 kt. at 3,000 m. (247 m.p.h. at 9,845 ft.) and a range of 2,000 nautical miles (n.m.) with maximum bomb load or 2,600 n.m. without bomb load, markedly exceeded those of the Navy Type 96 Attack Bomber Model 21 (Mitsubishi G3M2) then in production. To meet these stringent requirements Mitsubishi assembled a design team led by engineers Honjo, Hikeda and Kushibe. They began their work towards the end of 1937 but initial progress was slow because the project leader, Kiro Honjo, had to share his time between development work on the G3M2 Model 22 and the basic design of the new bomber. Meanwhile, other engineers were transferred from his team to the group which, led by Jiro Horikoshi, was designing the Navy Experimental 12-Shi Carrier Fighter, namely, the prototype of the Zero Fighter series.

Finally however, by August 1938, a full size mock-up was completed and this was inspected by a group of naval officers. As shown in mock-up form, the aircraft was characterized by a cigar-shaped, semi-monocoque fuselage providing accommodation for a crew of seven to nine and incorporating a defensive armament comprising four 7.7-mm. Type 92 flexible machine-guns (nose, dorsal and two blister positions) and one flexible 20-mm. Type 99 cannon in a tail turret. Whereas the Mitsubishi G3M carried its offensive load externally beneath the fuselage, the new aircraft was to carry bombs or torpedo in a ventral bomb-bay beneath the mid-mounted wings.

In order to meet the performance requirements, the Mitsubishi designers had to choose a pair of the new Mitsubishi Kasei (Mars) 14-cylinder air-cooled radials developing 1,530 h.p. on take-off—marking a departure from the instructions contained in the 12-Shi specification which called for the use of two engines in the 1,000 h.p. class—and designed two-spar wings housing unprotected integral petrol tanks with a total capacity of 4,900 litres (1,078 Imp. gal.).

During this initial mock-up inspection, a number of various minor changes was recommended by the Imperial Japanese Navy and these were incorporated in the mock-up prior to final inspection. This took place during the following month, at which time construction of two prototypes designated Mitsubishi G4M1 was authorized.

Construction of the first prototype in Mitsubishi's *Dai-San Kokuki Seisakusho* (Third Airframe Works) in Oe-Machi, Nagoya took up a full year and the aircraft was rolled-out in September 1939. Transferred to the Kasumigaura Airfield, flight tests began on October 23, 1939, when the G4M1's first flight was made by a constructor's flight crew captained by

*Cockpit and upper amidships gunner's position of the Model 11 was a one-piece fabrication as this photograph—taken in the Philippines as recently as 1965—shows to advantage.*  
(Photo: via René J. Francillon)





A Model 11 of the 3rd Kokutai photographed at its base in the Netherlands East Indies in 1942. Note the white surround to the national insignie, the Hinomaru. Ground clearance for the rear fuselage could be described as marginal when seen at this angle. This unit operated G4Ms only briefly since it was primarily a fighter unit. On November 1, 1942 the 3rd was redesignated the 202nd Kokutai. (Photo: Australian War Memorial, No. 129735)

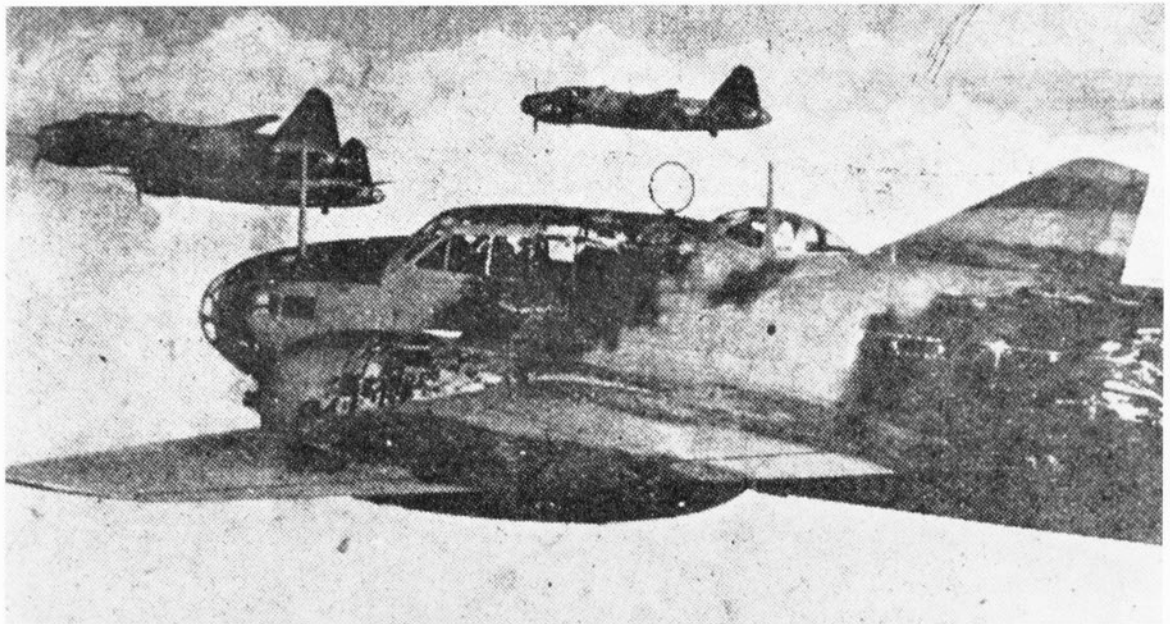
Katsuzo Shima. After completing its manufacturers' flight trial programme the prototype was flown to the *Dai-Ichi Kaigun Koku Gijitsusho* (First Naval Air Technical Arsenal) at Yokosuka for service trials.

The second prototype, which had been completed in February 1940, demonstrated performance levels substantially exceeding requirements, actual top speed and maximum range being respectively 240 kt. (276 m.p.h.) and 3,000 n.m. It differed from the first prototype in minor internal details and in introducing an increase in vertical fin area and the use of aileron tab balances.

As these events were taking place a controversy was raging among members of the Imperial Japanese Navy's air staff. While some senior officers were recommending that the G4M1 be ordered into pro-

duction immediately, others, led by members of the Yokosuka Experimental Air Corps, held the opinion that the Navy Type 96 Attack Bomber Model 22 (Mitsubishi G3M2) was meeting navy needs as far as land-based bombers were concerned. In the opinion of this second group of officers, production phasing-out of the G3M2 in favour of the G4M1 would reduce the number of bombers available to units operating in China. Furthermore, they contended that what the Imperial Japanese Navy needed most was a heavily-armed, twin-engined, escort fighter capable of defending the available G3M2s in their deepest penetration sorties over enemy-held territory in China. To this effect, these officers prevailed on the *Koku Hombu* (Air Headquarters) to instruct Mitsubishi to continue production of the G3M2 and to put into

Another unidentified Kokutai of Navy Type 1 Attack Bomber Model 11s. Although of poor quality, this picture illustrates the upper surfaces' camouflage of dark green and tan brown and, in this instance, a black-painted anti-dazzle area in front of the cockpit. (Photo: U.S. National Archives—Navy Dept.)





*The second of the surrender Model 11s on Ie Shima Island, August 19, 1945. Both followed the Allied instructions that the surrender aircraft should be devoid of national markings and armament and that they should be painted all-white and carry large green crosses on wings, fuselage and tail. (Photo: U.S.A.F. archives)*

production a twin-engined escort fighter making use of the airframe—and Mitsubishi MK4A Kasei 11 engines—of the G4M1.

Designated Navy Type 1 Wingtip Convoy Fighter, the Mitsubishi G6M1—of which 30 were produced in 1940—differed from the two G4M1 prototypes in carrying a much heavier defensive armament. The two 7.7-mm. machine-guns firing through the blisters on each side of the G4M1 fuselage were replaced on the G6M1 by a single hand-held 20 mm. cannon and the bomb-bay was faired over to accommodate a ventral gondola housing one forward-firing and one rearward-firing 20-mm. cannon. To conserve weight and partially to offset the heavy load of reserve ammunition drums (the Type 99 Model 1 cannons were fed from 45-shell drums), the relatively ineffective dorsal machine-gun of the G4M1 was discarded and internal fuel capacity was reduced by more than one-quarter, to 3,640 litres (800 Imp. gal.). Despite these efforts, the weight of the G6M1 was still too high and its performance was disappointing.

Thus, the Imperial Japanese Navy was to learn—several years ahead of the U.S.A.A.F. which made, in 1943, two similar experiments with its Boeing XB-40 and Consolidated XB-41 versions of the B-17 Flying Fortress and B-24 Liberator—that heavily-armed escort fighters derived from bomber airframes were

unable to maintain formation with the bombers once the latter had dropped their bombs.

The failure of the G6M1 concept left the Imperial Japanese Navy without the immediate benefit of possessing bombers superior to its G3M2s and with 30 useless Wingtip Convoy Fighters. Accordingly, further G6M1 production was cancelled during the summer of 1940 in favour of production of the standard G4M1 bomber, which received the designation Navy Type 1 Attack Bomber Model 11. The existing G6M1s were initially modified as trainers under the designation Navy Type 1 Large Land Trainer (G6M1-K) and then further modified as transports under the designation Navy Type 1 Transport (G6M1-L2). In their final form, G6M1-L2s were used to carry paratroopers of the Japanese Marines and, at the end of the war, surviving aircraft were still operated by the 1006th *Kokutai* (Naval Air Corps).

The first production Navy Type 1 Attack Bomber Model 11 was completed at Nagoya in October 1940 and differed little from the second G4M1 prototype. Even though the addition of operational equipment had resulted in a reduced top speed, from 240 kt. (276 m.p.h.) to 231 kt. (266 m.p.h.), the production G4M1s still exceeded the 12-Shi specification maximum speed requirement by some 16 kt. (19 m.p.h.).

Of the 1,200 production G4M1s built by Mitsubishi

*Model 21. A Navy Type 1 Attack Bomber Model 21 with search radar antennae above the nose transparencies and to the rear of the fuselage. This is a post-surrender (August 1945) picture as indicated by the absence of propellers. (Photo: via René J. Francillon)*





*Model 22. One of the 64 Navy Type 1 Attack Bomber Model 22s completed without the bulged bomb-bay doors.*  
 (Photo: Real Photographs, No. 3913)

in the Nagoya Third Airframe Works between October 1940 and January 1944, 661 were Model 11s.

The remainder of the production was accounted for by a modified version, introduced in 1942, incorporating the results of combat experiences. This version, the Navy Type 1 Attack Bomber Model 21, differed externally from the Model 11 in having glazed flush panels instead of lateral fuselage machine-gun blisters and in having a modified tail cone with a cut-out to improve the ease of movements of the hand-held flexible 20-mm. cannon. Internally the aircraft differed markedly from the Model 11. The powerplant was now two Mitsubishi MK4E Kasei 15s which had a higher altitude rating, thus enabling the aircraft to

cruise above the effective ceiling of light anti-aircraft guns. Also, fuel tank protection was introduced in the form of a carbon dioxide fire extinguishing system plus rubber sheeting beneath the wing tanks and layers of rubber sheet and sponge beneath the fuselage petrol tanks.

Development of a replacement for the Mitsubishi G4M1 had been initiated in 1941 when Mitsubishi was instructed to develop a Navy Experimental 16-Shi Attack Bomber. However, work on this aircraft, the G7M1 Taizan (Great Mountain), was expected to occupy several years and so the Navy also instructed Mitsubishi to develop the G4M2. This advanced version of the Navy Type 1 Attack Bomber Model 21,

*Another Model 22, this time bearing the hastily applied legend of ATAIU/SEA, the evaluation team of the Allied Technical Air Intelligence Unit, South-east Asia which tested all captured enemy aircraft. Note the Royal Air Force-style red, white and blue wing and fuselage roundels.*  
 (Photo: Australian War Memorial, No. 129734)







Factory-fresh G4M2a or Model 24. Complete and ready for test flight—except for the spinners—this Navy Type 1 Attack Bomber Model 24 has its distinctive bulged bomb-bay clearly visible in this view. The illusion of a dorsal fin attachment is created by the sloped roof of an assembly hangar in the background. The flap guides are shown to advantage; also the rounded wing tip.

(Photo: Mitsubishi Jukogyo K.K.)

was a stopgap measure pending availability of the twin-engined G7M1 Taizan and the four-engined Nakajima G8N1 Renzan (Mountain Range). Eventually neither the G7M1 or the B8N1 entered service and the stopgap G4M2 became the standard attack bomber of the Imperial Japanese Navy during the last two years of the war.

In designing the G4M2, design engineers Honjo and Hikeda strove to improve the range and speed performances and to increase the defensive armament. At the same time, they worked on the problems of easing the tasks of the crew by improving the aircraft's stability and by fitting a new type of bomb-aimer's window. To increase performance, two Mitsubishi MK4P Kasei 21s with water-metanol injection—rated at 1,800 h.p. for take-off and driving 4-blade propellers instead of the 3-blade types fitted to the Kasei 11s or 15s of the G4M1—were installed and an auxiliary fuselage tank increasing total capacity to 6,490 litres (1,428 Imp. gal.) was provided. A new wing, employing a laminar flow aerofoil, was adopted.

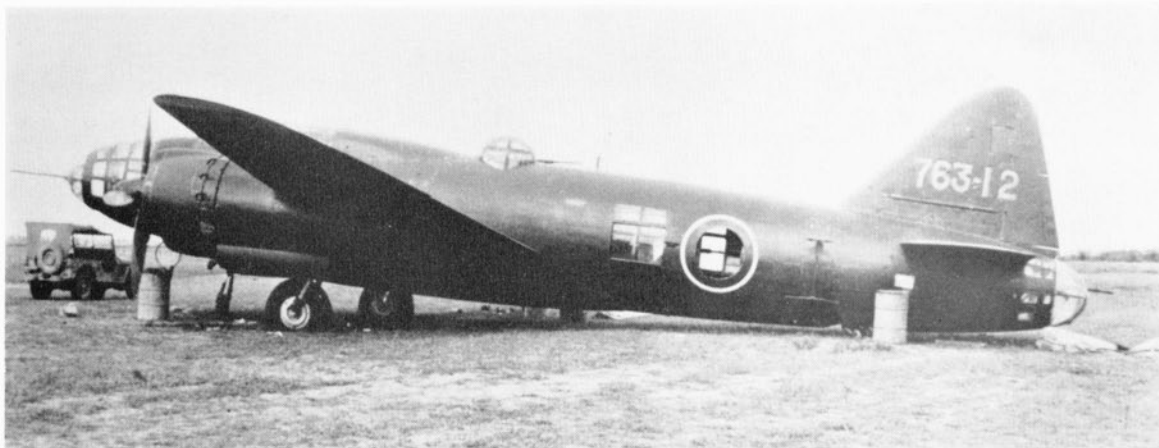
Defensive armament was strengthened by replacing the hand-held dorsal machine-gun with a power-operated turret housing a flexible 20-mm. Type 99 Model 1 cannon and by adding a flexible and removable 7.7-mm. Type 92 machine-gun, firing through small ports on either side of the nose. Other modifications introduced on the G4M2, which was completed in November 1942, included the fitting of horizontal tail surfaces of increased span and area and a redesign of the aircraft's nose where the glazed area was sizeably increased in area. Finally, the tips of the wings and vertical and horizontal tail surfaces were rounded.

Because of delays in the production of the Kasei 21 engines, Mitsubishi could not start quantity\* production of the G4M2 until July 1943 and production of the earlier G4M1 Model 21 did not cease until January 1944. Eventually, a total of 1,154 G4M2s was produced by Mitsubishi in the Third Airframe Works, Oe-Machi and the *Dai-Nana Kokuki Seisakusho* (Seventh Airframe Works) in Okayama. Primarily, these were the Navy Type 1 Attack Bombers Model 22 and Model 24. Variants, differing in the types of engines fitted and in various armament modifications, were produced as follows:

**G4M2 Model 22:** 1,800 h.p. Mitsubishi MK4P Kasei 21 engines. Armament including one 7.7-mm. machine-gun on a ball-and-socket mount in the extreme nose, one 7.7-mm. machine-gun for either side of the nose, and, amidships, one 7.7-mm. machine-gun each side in beam hatches and, finally, one 20-mm. cannon in the dorsal turret and one hand-held 20-mm. cannon in the extreme tail. The third G4M2 was tested with permanently fitted, electrically-operated bomb-bay doors whereas all previous G4Ms had removable bomb-bay doors which were detached when bombs were carried. Starting with the 65th G4M2 Model 22, these bulged bomb-bay doors were fitted to all variants of the G4M2 and G4M3, with the exception of the G4M2e Model 24J. Including prototypes, 274 Model 22s were built.

**G4M2 Model 22A:** Same engines as Model 22 but armament increased by substituting 20-mm. cannons for the 7.7-mm. machine-guns previously mounted in the beam positions; 50 built.

**G4M2 Model 22B:** Development of the Model 22A



*Model 24. Tail markings identify this G4M2a—abandoned in the Philippines in 1945—as having belonged to the 763rd Kokutai. This was one of three such units flying the G4M “Betty” during the 1944–5 campaign in the Philippines. The open hatchway, conveniently centred on the Hinomaru white-outlined national insigne, shows through to the starboard amidships waist-gunner’s position.*

(Photo: C. W. Beilstein Collection)

in which the four 20-mm. cannons (dorsal and tail turrets, and two beam positions) were faster firing, belt-fed Type 99 Model 2s instead of drum-fed Type 99 Model 1s; only a few built.

**G4M2a Model 24:** 1,825 h.p. Mitsubishi MK4T Kasei 25 engines. Same armament as Model 22; 14 built.

**G4M2a Model 24A:** Same engines as Model 24 and same armament as Model 22A; 15 built.

**G4M2a Model 24B:** Same engines as Model 24 and same armament as Model 22B; 171 built.

**G4M2a Model 24C:** Major production variant of the G4M2 series differing from the Model 24B only in having the 7.7-mm. machine-gun on the ball-and-socket mount in the nose replaced by a 13-mm. Type 2 machine-gun.

**G4M2b Model 25:** 1,825 h.p. Mitsubishi MK4T-B Kasei 25b engines. Second G4M2a Model 24 modified to test the Kasei 25b which developed its rated power at higher altitudes.

**G4M2c Model 26:** 1,825 h.p. Mitsubishi MK4T-B Ru Kasei 25b Ru engines fitted with turbo-supercharger. Two G4M2a Model 24Bs modified as test-bed.

**G4M2d Model 27:** 1,795 h.p. Mitsubishi MK4V Kasei 27 engines. Third G4M2 prototype, the one on which the bulged bomb-bay doors were previously tested, modified as engine test-bed.

**G4M2e Model 24J:** Version basically similar to the G4M2a which was specially modified to carry the Navy Suicide Attacker Ohka (Cherry Blossom) Model 11. The bomb-bay doors were removed to

*Another view of the Model 24 of the 763rd Kokutai in the Philippines. Presumably it was sufficiently badly damaged to preclude repair before the retreating Japanese forces abandoned the air base. The upper turret mounts a 20-mm. Type 99 Model 1 cannon.*

(Photo: U.S. Navy archives)







*The same Model 24 of the 763rd Kokutai. Damage to the nose above the search radar antenna is visible.*  
 (Photo: U.S. National Archives—Navy Dept.)

enable the carriage of the Ohka under the belly of the aircraft.

As already related, the G4M1 and the G4M2 had been fitted with two entirely different sets of wings yet, during 1943, engineers Takahashi and Kuroiwa undertook to design a third set of wings which eventually characterized the G4M3 version of the Navy Type 1 Attack Bomber. This time, emphasis was placed on petrol tank protection.

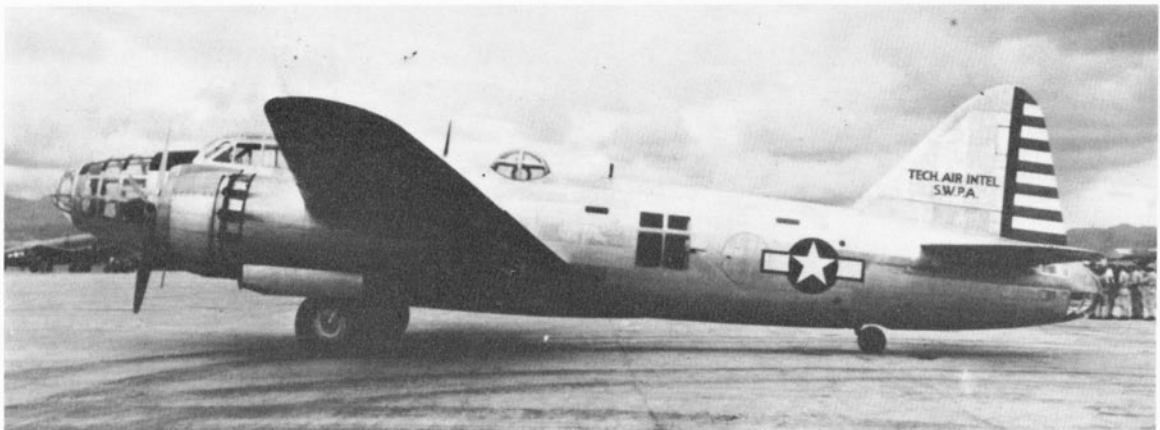
The two-spar structure of the previous sets of wings gave place to a single-spar structure housing self-sealing petrol tanks with a reduced capacity of 4,490 litres (998 Imp. gal.). Concurrently with this major redesign effort, armour-plating was introduced to protect the crew and the tail turret was modified to increase the field of fire of the 20-mm. cannon. This last modification, however, resulted in a reduction in overall length which, coupled with a redistribution of weight (e.g. armour) throughout the fuselage,

upset the centre of gravity location and affected stability. The solution to this problem was found during the wind tunnel tests and the G4M3, the first of which was completed in January 1944, was characterized by dihedral on its horizontal tail surfaces. From the outset, the intention had been to power the G4M3 with the turbo-supercharged Kasei 25b Ru engines tested on the two G4M2c Model 26s. However, powerplant teething troubles forced the designers to install standard Kasei 25 engines on the 58 G4M3 Model 34s completed. Only two Model 36s—the third and fifteenth G4M3s—were actually tested with turbo-supercharged engines.

The G4M3a Model 34a was a projected anti-submarine patrol bomber which was not realized. Plans for the mass production of the G4M3 Model 36 could not be implemented prior to surrender.

In almost six years, Mitsubishi delivered two 12-Shi prototypes, 30 G6M1s, 1,200 G4M1s, 1,154 G4M2s

*A captured Model 24 acquired by the United States Technical Air Intelligence (South-west Pacific Area). The two "dots" above and below the rear blue-bordered, white bar of the U.S. military insigne indicate the positioning points for the search radar antenna.*  
 (Photo: U.S. Navy archives)



and 60 G4M3s. Between October 1940 and August 1945, the period during which the G4M was in quantity production, deliveries lagged 14% below government orders (see Table III).

However, during the mid-war years, Mitsubishi Jukogyo K.K. met or exceeded G4M production requirements and only in 1945—following the heavy destruction brought about by the earthquake of December 7, 1944, and the Boeing B-29 Superfortress operations—did production fall substantially below requirements. Throughout their production life, the G4Ms were produced at an average rate of 41 aircraft per month and the peak production month was October 1944 when 109 G4M2s and G4M3s were produced.

### OPERATIONAL CAREER

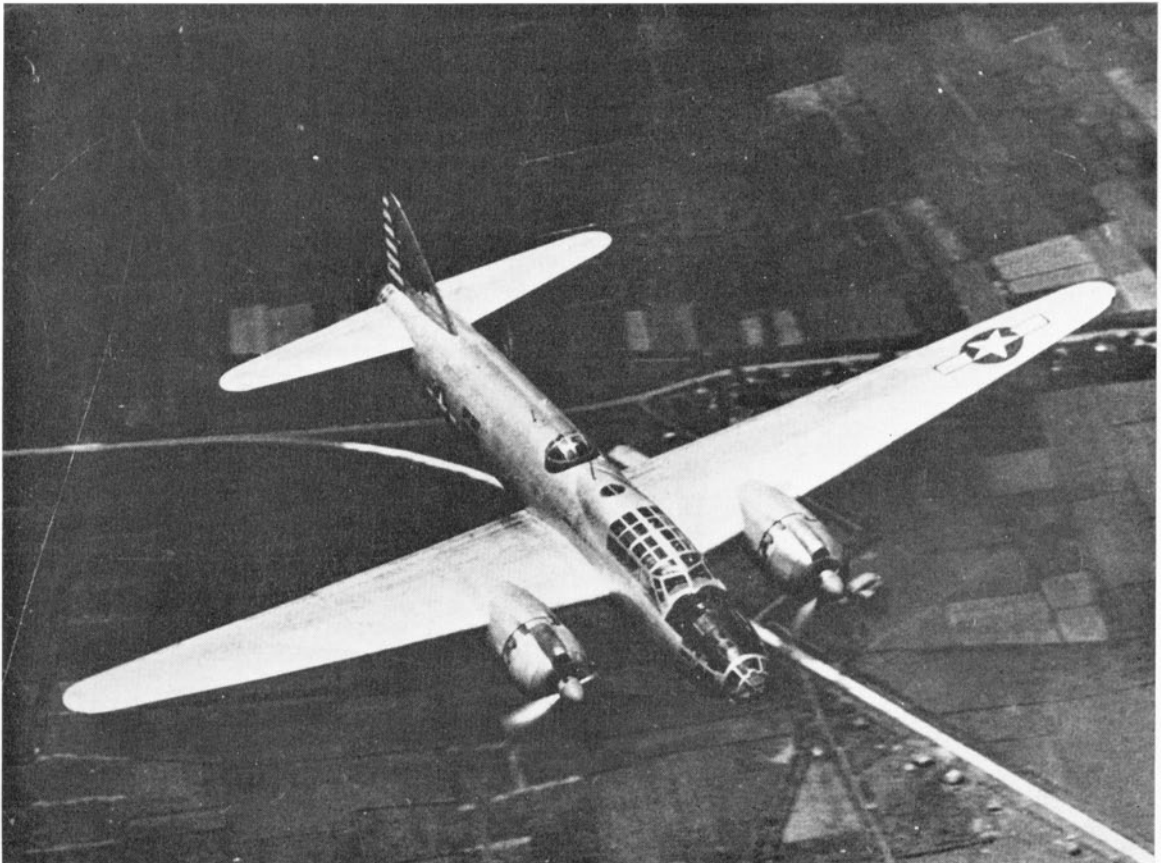
Following the cancellation of the G6M1 programme, production of the G4M1 was undertaken by Mitsubishi during the summer of 1940 and resulted in the delivery of the first production aircraft in October of that year. By the end of March 1941, 25 G4M1s had been delivered to the Imperial Japanese Navy and, having successfully undergone service trials, the type was declared ready for operational service. The first unit to receive G4M1s was the 1st *Kokutai* (Naval Air Corps) which was activated at Kanoya, Kagoshima Prefecture, on the island of Kyushu. Assigned to the

21st *Koku Sentia* (Air Flotilla) this unit was transferred to Hankow, China, between July 25 and 31, 1941 where the first combat sorties were flown against targets in Chengtu and Chungking. However, by August 1, the 1st *Kokutai* was back at their Kanoya base where intensive crew training took place in preparation for the war against the Western Powers and, on November 10, the unit moved to Tainan, Formosa, ready to strike at the American installations in the Philippines. Eventually, the 1st *Kokutai* was redesignated 752nd *Kokutai* on October 31, 1942 and became the only unit of the Imperial Japanese Navy to operate various versions of the G4M throughout the Pacific War.

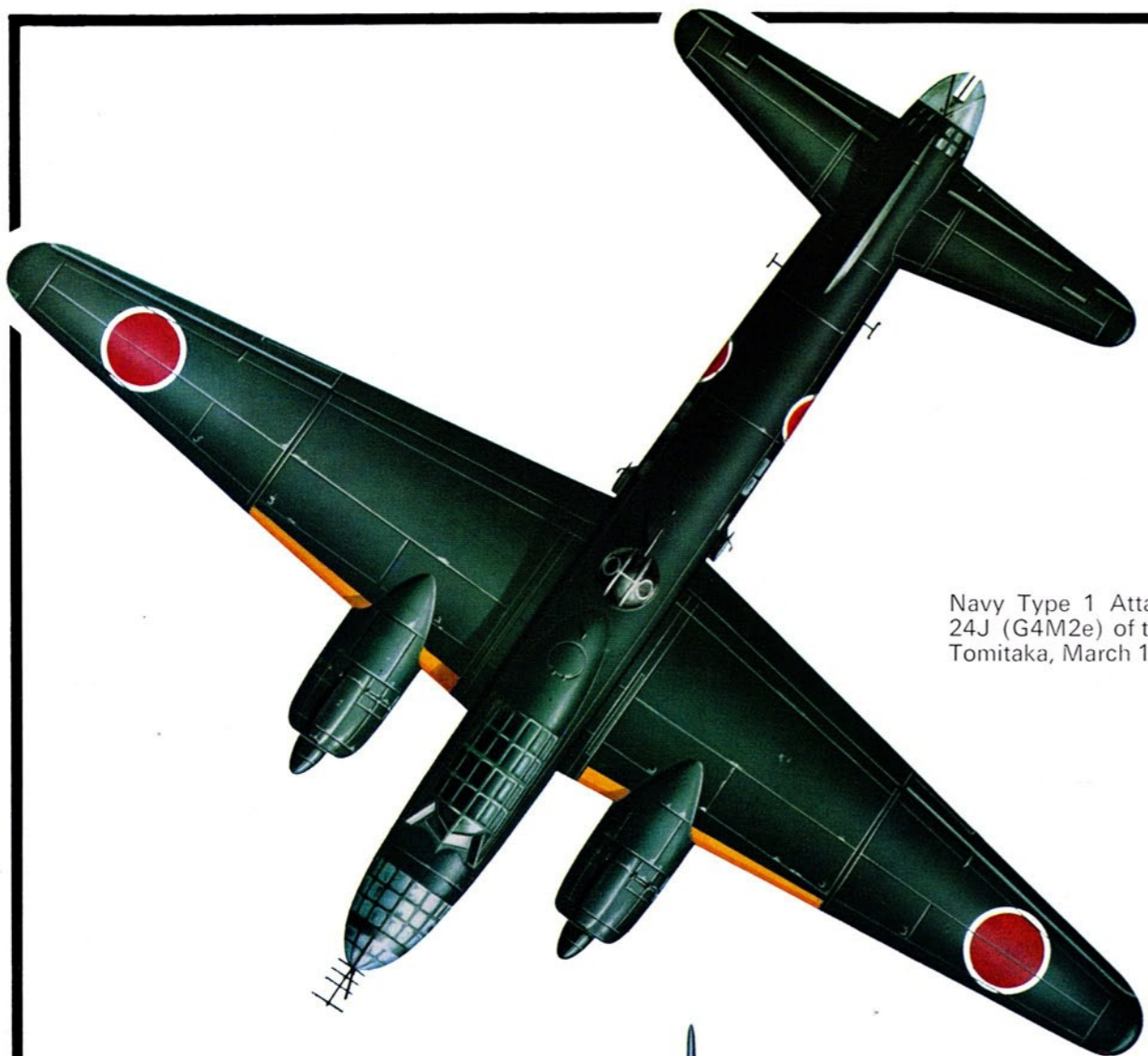
As the possibility of a war against the United Kingdom, the United States and their allies was becoming an inescapable certainty, the Kanoya *Kokutai* converted to G4M1s whilst the Kisarazu and Takao *Kokutais*—still retaining the older Mitsubishi G3M2s as their operational aircraft—began receiving a few G4M1s. On the eve of the war, 120 G4M1s—out of the 170 aircraft of this type so far built—were in first line service with the Kanoya *Kokutai*—which had its main base at Taichu, Formosa, but maintained a G4M1 detachment at Thudaumot, French Indo-China—and with the 1st *Kokutai* based at Tainan, Formosa. On December 8, 1941 (local time) 54 G4M1s of the 1st and Kanoya *Kokutais* joined a

*A final view of the Tech. Air Intel.-acquired Model 24, this time seen flying over the United States. The comparatively "aerodynamically-clean" lines of the Model 24 are enhanced by the absence of camouflage paint and only the forward anti-dazzle black strip destroys the detail of panelling on the nose section.*

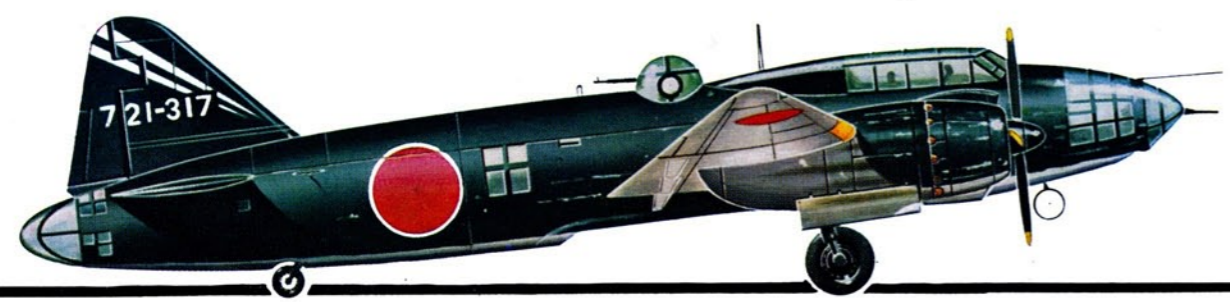
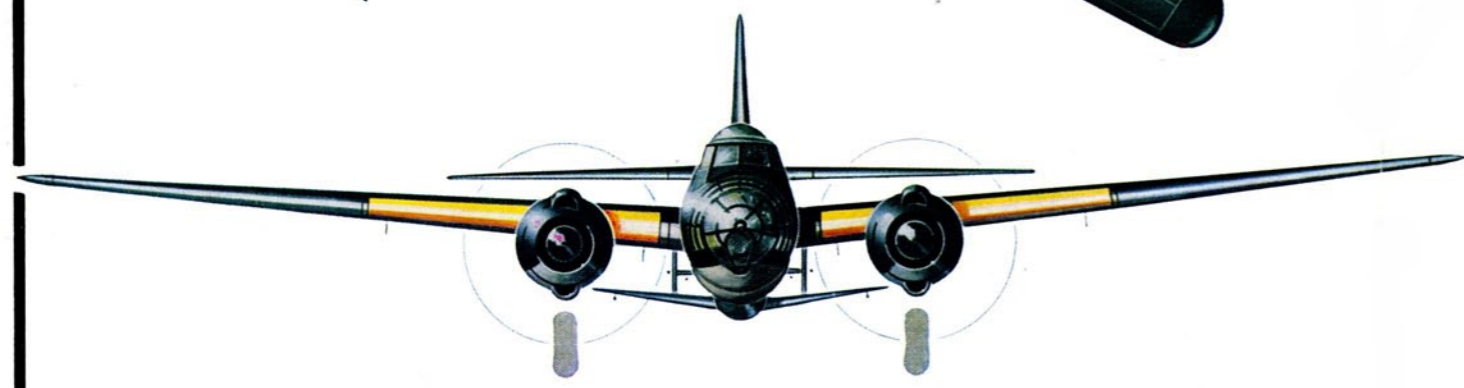
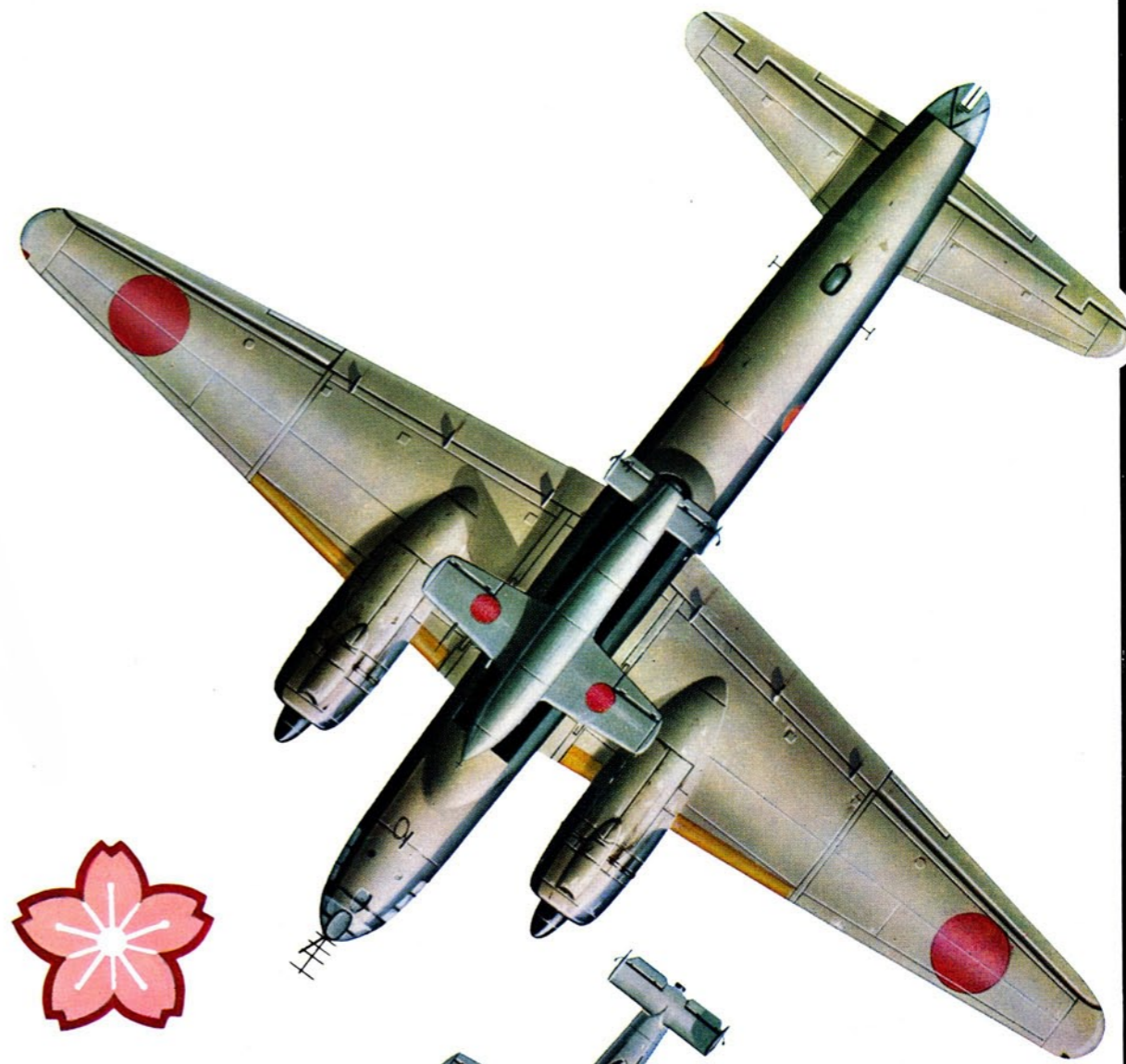
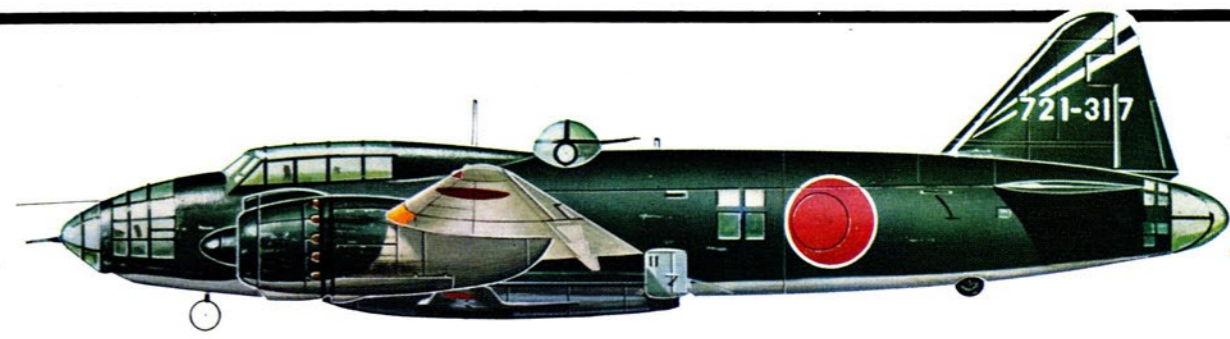
(Photo: U.S. Navy archives)







Navy Type 1 Attack Bomber Model 24J (G4M2e) of the 721st Kokutai at Tomitaka, March 1943







*Model 26 in development. Possibly one of the two G4M2c Model 26s—fitted with turbo-supercharged Kasei 25b Ru motors—used as development prototypes for the G4M3 series.*  
(Photo: via René J. Francillon)

similar number of G3M2s of the Takao *Kokutai* in the first attack against American air bases at Iba and Clark Field in the Philippines where they caused considerable damage. Two days later 24 Thudautombased G4M1s of the Kanoya *Kokutai* assisted 60 G3M2s of the Genzan and Mihoro *Kokutais* in sinking H.M.S. *Prince of Wales* and H.M.S. *Repulse* off the coast of Malaya. During this attack, 14 of the 24 torpedoes released by the aircraft of the Kanoya *Kokutai* were seen to hit the two British battleships and one of their escorting destroyers. Both capital ships quickly sank. Only two G4M1s were lost during this operation which fully vindicated Admiral Yamamoto's enthusiasm for long-range, land-based attack bombers.

Following initial attacks against Commonwealth forces in Malaya and United States forces in the Philippines, the Imperial Japanese Navy mounted operations against Allied forces in the Dutch East

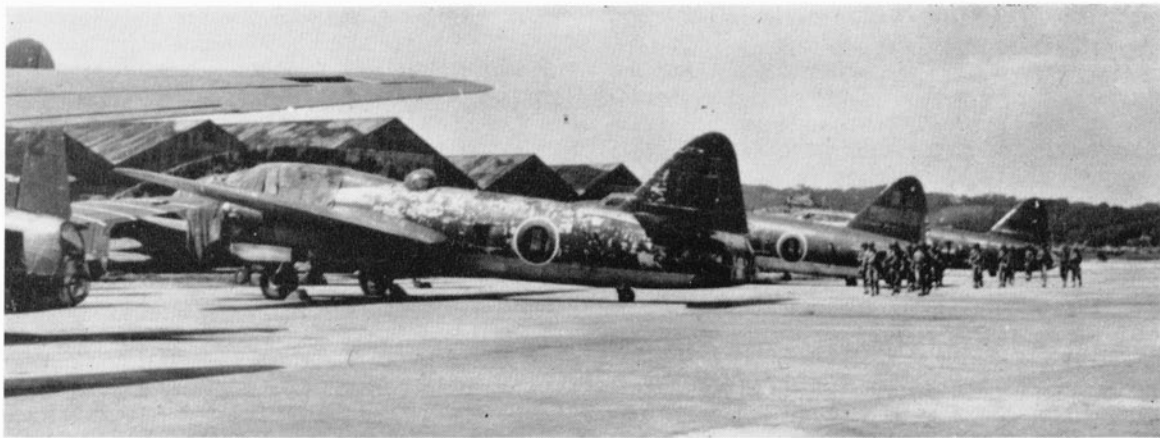
Indies and, by the early spring of 1942, G4M1 units—including the 1st, 4th, Kanoya and Takao *Kokutais*—were operating in an area encompassing the Dutch East Indies, New Guinea, Papua and New Britain.

During this period, the Japanese prepared themselves for the planned invasion of Australia. While the 4th and Takao *Kokutais* concentrated their efforts on applying pressure against Port Moresby on the southern tip of Papua, the 1st and Kanoya *Kokutais*, operating from Ambon (Amboina) and Kendari, joined with carrier-based aircraft in the first raid against Darwin, Northern Territory, on February 19, 1942. From then on, the "Betty"—as the type had been dubbed by the staff of the Materiel Section, Directorate of Intelligence, Allied Air Forces, Southwest Pacific Area—mounted sporadic attacks against targets in Australia until June 1944.

The major bomber units of the Imperial Japanese Navy taking part in these operations were the *Koku-*

*Model 34. After surrender and with propellers removed, a G4M3 Model 34 found at Atsugi in September 1945 by U.S. occupying forces. The kinked nose cone is evident.*  
(Photo: U.S. Navy archives)





*Model 34s. More G4M3s at Atsugi in September 1945. The nearest two Model 34s give evidence of the dihedral tailplane and the modified tail position is also visible; detail which characterized this version of the "Betty".* (Photo: U.S. Navy archives)

*tais* of the 1st (Feb. 1942), 705th (Nov. 1943–Feb. 1944), 753rd (Oct. 1942–May 1943), Kanoya (Feb. 1942) and Takao (Feb. 1942–Oct. 1942).

Perhaps the most successful attack against Darwin was that of May 2, 1943 when G4M1 Model 21 bombers of the 705th *Kokutai*, escorted by A6M3 ("Zeke") fighters of the 202nd *Kokutai*, dropped some 100 bombs on the old Darwin Royal Australian Air Force station. While damage on the ground was slight, the Japanese succeeded in shooting down three Spitfires from Nos. 54, 452 and 457 Squadrons and in forcing five other Spitfires to make forced landings, for the loss of six "Zekes" and no G4Ms.

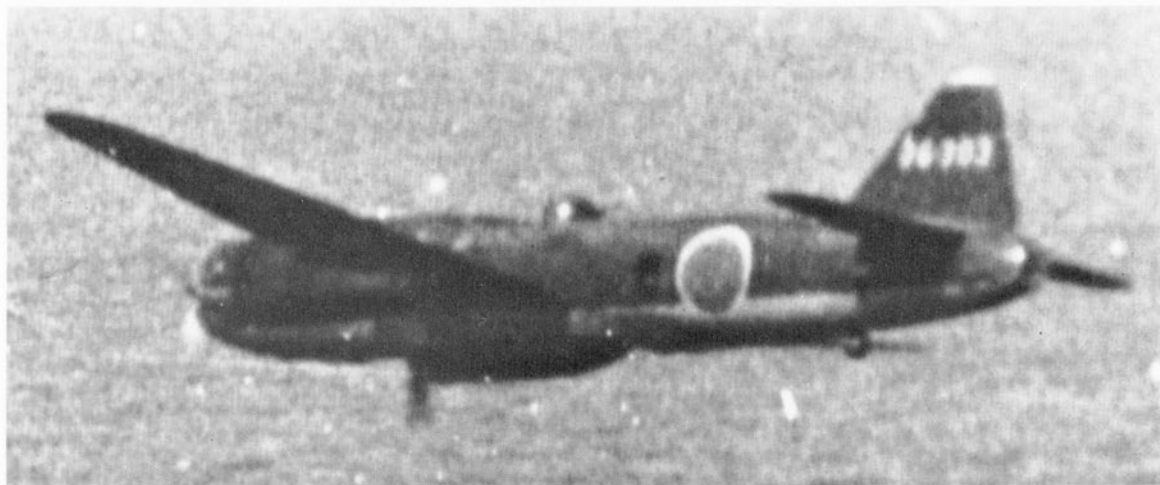
On June 30 the 705th *Kokutai* was back with 27 G4M1s escorted by 23 "Zekes." In spite of interception by 38 Spitfires, which resulted in the loss of three "Zekes" and six G4M1s, the Japanese attacking force pattern-bombed Fenton, destroying three Liberators of the U.S. 380th Bombardment Group, damaging seven others and causing the loss of four Spitfires.

However, these were isolated incidents because the Imperial Japanese Navy was seldom in a position to mount strong attacks with more than 50 fighters and bombers and because R.A.F. and R.A.A.F. Spitfires, effectively directed by radar stations, proved to be effective interceptors. Even though no strategic gain resulted from these operations against Australia, the Japanese were able to fix in the area a disproportionate number of Allied fighter aircraft thus easing pressure on their other units in the Solomons theatre.

By mid-1942 a total of 369 G4M1s had been built but combat losses and training casualties limited the number of G4M1s available for the six operational *Kokutais* to some 170 aircraft, while other aircraft of this type were operated by two *Kokutais* which had not yet reached operational status. On August 8, 1942, when American forces took the offensive by landing on Guadalcanal, G4M1s were based at Vunakanau, New Britain, with the 4th, Kisarazu and Misawa *Kokutais* and at Rabaul with the 1st and Chitose *Kokutais*. Intensive daylight

*Camera-gun proof. A G4M2 from the 706th Kokutai under attack by a U.S. Navy fighter with the Pacific below. Note the white tip to the fin and rudder and how the white encircling band make the red Hinomaru "meatball" stand out from the camouflaged fuselage.*

(Photo: U.S. National Archives—Navy Dept.)



operations, initially opposed by carrier-based Grumman F4F Wildcats of the U.S. Navy and later by Henderson Field's Wildcats of the Marine Corps and Bell P-39s and P-400s (Airacobras) of the U.S.A.A.F., were mounted by the Imperial Japanese Navy with an average of no more than eight to sixteen G4M1s being available for each mission.

Large-scale operations could seldom be mounted by the Japanese, but on October 3 they sent 34 G4M1s and Mitsubishi G3Ms ("Nell") escorted by 29 "Zekes". Because of heavy cloud cover the Japanese bombers failed to find Henderson Field but the intercepting force of 39 Wildcats and 12 Airacobras shot down seven Japanese bombers and four fighters. On October 13 luck changed side and during the morning raid, nine G4M1s roared down both runways at Henderson Field, damaged several U.S. aircraft and set fire to 5,000 gallons of aviation fuel. In the afternoon they were back again and at the end of the day they had lost one G4M1 and two "Zekes" out of the 24 bombers and 25 fighters taking part in both missions, but they had destroyed one Wildcat and created havoc at Henderson Field.

The fight around Guadalcanal was, however, taking a heavy toll of the meagre force of Japanese bombers and the Imperial Japanese Navy was forced

to re-organize its units in October and November 1942. To confuse Allied Intelligence—which had been able to identify several of the Japanese operational units—and to standardize the designation procedure of their combat units, the Japanese re-designated all their operational land-based attack bomber *Kokutais* by assigning to them a *Kokutai* number in the 700 range. Thus were created the 701st, 702nd, 703rd, 705th, 751st, 752nd, 753rd and 755th *Kokutais* which respectively stemmed from the former Mihoro, 4th, Chitose, Misawa, Kanoya, 1st, Takao and Wonsan *Kokutais*. On New Year's day 1943 these *Kokutais* operated from Vunakanau (701st and 705th), Kavieng (751st) and Kendari and Koepang (753rd) as part of the first-line force, and from Mili and Taroa (755th) and Roi (703rd and 755th) as part of the reserve force whilst the 702nd and 752nd *Kokutais* were at Kisarazu, Chiba Prefecture, for training.

During 1943 the G4M1s were supplemented by the first G4M2s and were deployed in the Solomons, where operations were marked by the fall of Guadalcanal on February 7 and the death of Admiral Yamamoto, Commander-in-Chief of the *Rengo Kantai* (Combined Fleet), who perished when the two G4M1s transporting the C.-in-C. and his staff were shot down on April 18.

*A G4M2 banking away while under attack by a Grumman F6F Hellcat from the U.S. Navy carrier.*

(Photo: U.S. National Archives—Navy Dept.)





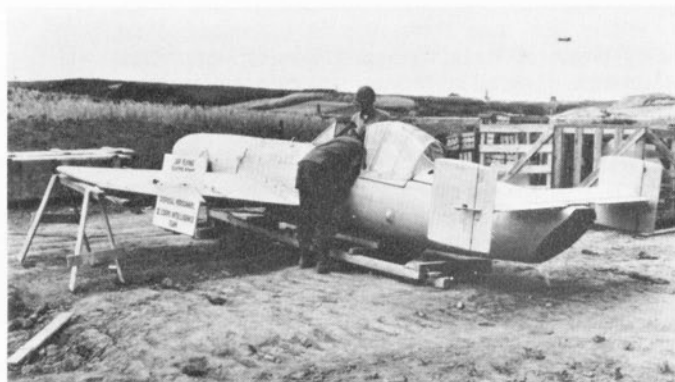


*Ohka K-1 trainer on display at the Air Museum, Ontario, California in 1969. (Photo: René J. Francillon)*

Even though the scale of operations during 1943 was small when compared to the events of 1944, this period was truly a war of attrition for the Imperial Japanese Navy which, in the face of steadily increasing Allied forces, was not able to increase its strength markedly. In particular, the number of G4Ms available to combat units remained almost constant as losses equalled production in spite of Mitsubishi's efforts which resulted in an average monthly production of 55 G4M1s and G4M2s during 1943.

The first six months of 1944 were marked by an acceleration of Allied offensive operations in the Pacific with advances being made along the northern shores of New Guinea, in the Solomons and in the Central Pacific. With seldom more than a dozen G4Ms available for each mission, the bomber *Kokutais* of the Imperial Japanese Navy fought gallantly while the High Command was endeavouring to keep in reserve as many G4M2s as possible to meet the threat of anticipated Allied operations against the Marianas and the Philippines.

*An Ohka Model 11 being inspected in 1945 by U.S. Army personnel of II Corps Intelligence Team specializing in bomb disposal. Members of the team provide useful scale effect. (Photo: via H. Eckert)*



This threat materialized on June 19 and 20, 1944 when a major air-sea action took place during the Battle of the Philippine Sea off the Marianas. To meet the 900 aircraft embarked aboard the carriers of Task Force 58, the Imperial Japanese Navy disposed of 450 carrier-based aircraft and 200 land-based aircraft including the G4M2s of the 755th *Kokutai* based on Guam. During this battle, which became known as the "Marianas Turkey Shoot", the Grumman F6F Hellcats of the U.S. Navy completely mastered their Japanese opponents and the 755th *Kokutai* ceased to exist.

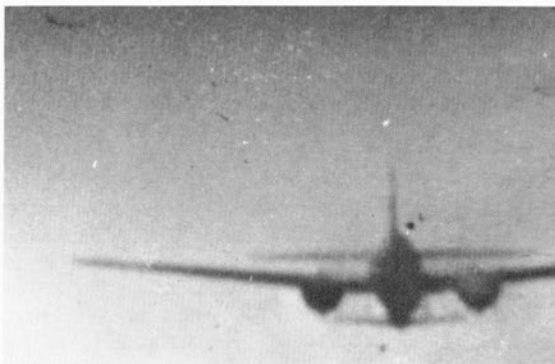
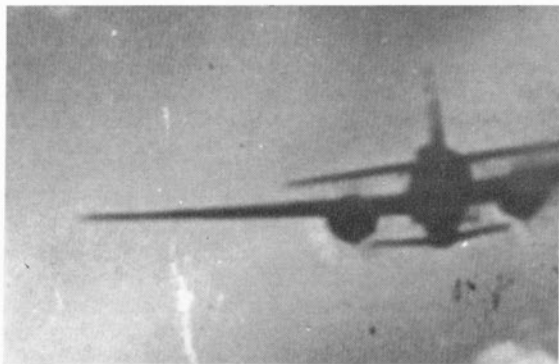
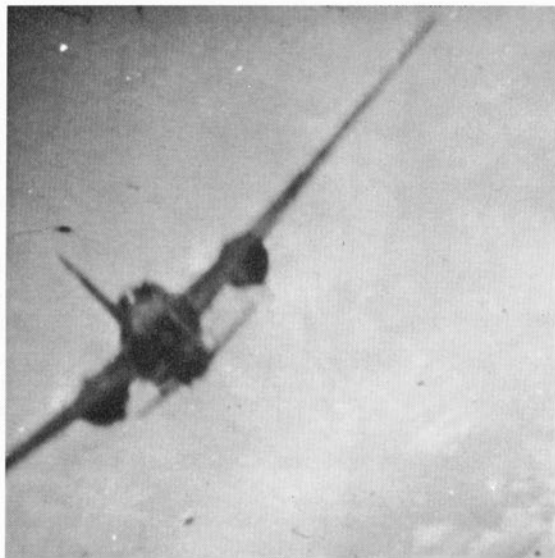
In the Philippines the Imperial Japanese Navy had at its disposal during the early fall of 1944 the G4M2s of the 761st *Kokutai* based at Davao and these aircraft were among the first to attack the American amphibious force which landed on Suluan Island on October 17 as the vanguard of General MacArthur's reconquest of the Philippines. In spite of heavy losses suffered both during offensive sorties and on the ground—where American carrier- and land-based aircraft damaged or destroyed a substantial number of G4M2s—the 761st *Kokutai* remained the only G4M2 unit available in the Philippines until December. During this month, however, this unit was reinforced by the similarly equipped 762nd and 763rd *Kokutais* which joined the 761st at Clark Field.

In the face of overwhelming American quantitative and qualitative air superiority, these units were forced to rely increasingly on night sorties by small formations of G4M2s. This tactic, however, did not prove too successful as U.S. night fighters—Northrop P-61 Black Widows and Hellcats—hunted the G4Ms. Thus, the Japanese bombers could do little but provide some harassment for the Allied ground forces. Finally, by February 5, 1945, the remnants of the 762nd *Kokutai* had been brought back to Kanoya where the unit converted to Yokosuka P1Y1s. The 761st and 763rd *Kokutais* ceased to exist.

The fall of the Philippines followed by the capture of Iwo Jima had made it clear that the G4M had become obsolete as its top speed was insufficient and its propensity to catch fire when hit was too great. Nevertheless, in the spring of 1945 and until the final surrender, three *Kokutais*—the 706th, 752nd and 765th—continued operating G4M2s in the conventional bombing rôle while a few G4M3s were operationally tested by the Yokosuka *Kokutai*. As conventional bombers the G4M2s were, towards the end of the Pacific War, in the process of being supplanted by the smaller but much faster two-engined Yokosuka P1Y1 Ginga. However, no operational history of the Navy Type 1 Attack Bomber would be complete without some details on the disappointing use of this type of aircraft as a mother aircraft for the Navy Suicide Attacker Ohka Model 11, the "Baka" bomb.

#### DEVELOPMENT OF A NEW WEAPON

Heavy losses suffered by G4Ms during conventional combat missions and conversely, successes registered by smaller and faster aircraft during suicide sorties, led the Imperial Japanese Navy to consider favourably a proposal submitted by Ensign Mitsuo Ohta. What the ensign, a transport pilot serving with the 405th



*A sequence of five camera-gun shots of a U.S. Navy fighter interception on a Navy Type 1 Attack Bomber Model 24J acting as the "mother ship" for a Navy Suicide Attacker Ohka Model 11.*  
(Photos: U.S. National Archives—Navy Dept.)

*Kokutai*, proposed was a simple aircraft intended solely for *Kamikaze* (Divine Wind) operations, to be powered by a battery of solid-propellant rockets and to be carried within proximity of its Allied naval vessel targets in the belly of specially-modified G4M2s.

As this piloted weapon project appeared to be capable of easing the task of its Navy Type 1 Attack Bombers which, because of increasing Allied air

superiority, could seldom reach their conventional bomb-dropping points, the Imperial Japanese Navy took over the project in August 1944.

Initial design work had been made by Ensign Ohta assisted by personnel from the Aeronautical Research Institute of the University of Tokyo, but detailed design was the responsibility of a team of engineers of the *Dai-Ichi Kaigun Koku Gijitsusho* (First Naval Air Technical Arsenal) at Yokosuka. Designated Navy Suicide Attacker Ohka (Cherry Blossom) Model 11 or Yokosuka MXY7, the aircraft was of small size and was powered by three Type 4 Mark 1 Model 20 rockets installed in its tail. The nose contained a 1,200 kg. (2,646 lb.) warhead and the pilot sat in an enclosed cockpit behind the trailing edge of the wings.

Within less than three months unmanned flight trials began at Kashima and, following unpowered glide tests, powered flight was first made in November 1944 with the test aircraft being carried aloft under the belly of a specially-modified G4M2a Model 24.

Production of the Ohka Model 11—the only version of this suicide aircraft used operationally—was accomplished by the First Naval Air Technical Arsenal which produced 155 aircraft of this type and by a group centered around the *Dai-Ichi Kaigun Kokusho* (First Naval Air Arsenal) at Kasumigaura which used Nippon Hikoki K.K. (Japan Aeroplane Co. Ltd.) and Fuji Hikoki K.K. (Fuji Aeroplane Co. Ltd.) as subcontractors and which produced a further

600 Ohka Model 11s. In addition, several other Ohka versions were either projected or built in limited numbers as follows:

**Ohka K-1:** Unpowered training version of the Model 11 fitted with retractable landing skids. Water ballast replaced the warhead. Forty-five built.

**Ohka Model 21:** Projected smaller version of the Model 11 intended to be carried by the Yokosuka PIY3 Ginga Model 33. Warhead weight reduced to 600 kg. (1,323 lb.). Not built.

**Ohka Model 22:** Development of the Model 21 in which the solid-propellant rockets were replaced by a Tsu-11, an Italian Campini-type jet engine. Fifty built by the *Dai-Ichi Kaigun Koku Gijitsusho* with projected follow-on production assigned to Aichi Kokuki K.K., Fuji Hikoki K.K., Miguro Hikoki K.K. and Murakami Hikoki K.K. Limited flight trials only.

**Ohka Model 33:** Projected version which was to be carried aloft by the four-engined Nakajima G8N1 Renzan bomber. One Ne-20 turbojet and 800 kg. (1,764 lb.) warhead. Not built.

**Ohka Model 43A:** Enlarged version of the Model 33 which was intended to be launched from surfaced submarines and was to have had folding wings. Not built.

**Ohka Model 43B:** Similar to Model 43A but intended to be launched from catapults installed in caves on the shores of Japan. Not built.

**Ohka Model 43 K-1 KAI Wakazakura (Young Cherry):** Two-seat training version. One Type 4 Mark 1 Model 20 rocket engine provided to obtain limited power-handling experience. Two built.

**Ohka Model 53:** Projected version intended to be towed aloft. Not built.

To carry the Ohka Model 11, Mitsubishi developed the G4M2e Model 24J. Initially, these "mother" aircraft were produced by modifying on the assembly line a number of G4M2a bombers but, later, a small number of G4M2es was built as such by Mitsubishi. On the G4M2e the bomb-bay doors were removed and special shackles were fitted in the bomb-bay to carry the Ohka Model 11 which protruded under the belly of the twin-engined bomber.

As soon as a sufficient number of parent aircraft was available, the Imperial Japanese Navy activated two specialized *Kokutais*, the 721st at Hyakurigahara and the 722nd at Konoike. After completing their training period, these two units awaited the propitious moment to use their revolutionary weapons. Concurrently with the activities of the 721st and 722nd *Kokutais*, the Imperial Japanese Navy began to transport Ohka Model 11s to forward bases for use by these two combat units. In so doing, however, the Navy lost several Ohkas transported aboard the giant aircraft carrier *Shinano* when this ship was sunk by the submarine U.S.S. *Archerfish* on November 29, 1944. More Ohkas stored in underground hangars on Okinawa were captured by the U.S. Marine Corps.

For combat sorties the Imperial Japanese Navy intended to send formations of Ohka-carrying G4M2es with strong fighter escorts to within 20 nautical miles of the Allied fleet. At this point, while flying at an altitude of 5,000 to 5,500 m. (16,405 to 18,045 ft.), the parent G4M2es were to release their



Recalling the simplicity of instrumentation of a World War I scout is this interior of a Model 11. Note the external "ring and bead" sight and the centreline hoisting ring forward of the ringsight. (Photo: U.S.A.F. archives)

Ohkas and then return to their base. After being released from the parent aircraft the Ohka pilots could either initially glide towards their targets and then ignite the three rockets simultaneously or, if they wished to extend their range, they could immediately ignite one or two of their rockets.

However, in practice, this tactic could be seldom implemented under combat conditions as the heavily-laden G4M2es fell easy prey to the standing air patrols of Hellcats and Vought F4U Corsairs flying 50 to 100 miles ahead of the fleet they were protecting. This was the case on March 21, 1945, when 18 G4M2es of the 721st *Kokutai* took the Ohkas on their first mission. Intercepted some 60 miles away from the U.S. carriers, the G4M2es were forced to release their Ohkas prematurely. The Ohkas crashed into the sea while all the bombers were shot down by the American fighters.

Taking advantage whenever possible of dawn, dusk or moonlight conditions, the G4M2e/Ohkas of the 721st and 722nd *Kokutais* made several sorties against the Allied fleet supporting the operations against Okinawa. The first success was registered on April 1 when the battleship U.S.S. *West Virginia*—one of the survivors of Pearl Harbour—was seriously damaged. On April 12, the destroyer U.S.S. *Mannert L. Abele* became the first Allied ship to be sunk by Ohkas. Several other American and British ships were damaged or sunk by Ohkas but no major vessels—aircraft carriers, battleships or cruisers—were sunk by Ohkas. More often than not, these piloted bombs had to be released too early by their parent aircraft and thus could only reach the radar-picket destroyer



screen cruising ahead of the Allied fleet. For the Imperial Japanese Navy this was a small return for the heavy price paid and the Ohka Model 11, in retrospect, appears to have merited the derogatory nickname which had been bestowed on it by American sailors: "Baka" (Imbecile).

As the use of the Ohka Model 11 had proved comparatively unsuccessful, the Imperial Japanese Navy was forced to continue conventional bombing operations with their G4M2s and the number of aircraft of this type available for combat dwindled as the Allies intensified the level of their operations. At the time of the surrender the Imperial Japanese Navy was left with only 218 operational twin-engined bombers of which the majority were Yokosuka PIY1/PIY2 Gingas.

## CONCLUSION

Backbone of the Japanese bomber force during the Pacific War, the Mitsubishi G4M series can be regarded as one of the truly great twin-engined bomber aircraft of this period. The G4M, in all of its versions, is reported to have been pleasant to fly and the maintenance of its airframe, engines and equipment presented few difficulties even under the primitive conditions often prevailing in the field. Its defensive armament, which left only small blind spots immediately above and below the aircraft, was satisfactory, particularly in the case of the Navy Type 1 Attack Bomber Model 24C. However, its offensive capability was insufficient as the maximum bomb-load was only 2,205 lb. *versus* 6,000 lb. for the Vickers Wellington B. Mk. X. Compared with

**TABLE I: COMPARATIVE DATA ON REPRESENTATIVE AMERICAN, BRITISH, GERMAN, ITALIAN, AND JAPANESE BOMBERS**

	<b>B-17E (U.S.A.)</b>	<b>Halifax B. Mk. III (U.K.)</b>	<b>He 111 H-6 (Germany)</b>	<b>CANT Z.1007 (Italy) 1940</b>	<b>G4M2 Model 22 (Japan) 1942</b>
Year first produced	1941	1943	1939	1940	1942
Span (ft. in.)	103 9	194 2	74 1½	81 4⅝	82 0¼
Wing area (sq. ft.)	1,420	1,275	943	—	841
Take-off weight (lb.)	40,260	54,400	25,000	28,211	27,558
Wing loading (lb./sq. ft.)	28.4	42.7	26.5	—	32.8
Take-off power (h.p.)	4 × 1,200	4 × 1,615	2 × 1,340	3 × 1,100	2 × 1,800
Power loading (lb./h.p.)	8.4	8.4	9.3	8.5	7.7
Maximum speed (m.p.h.)	317	282	258	311	272
Normal range (miles)	2,000	1,030	760	1,242	1,554
Normal bomb-load (lb.)	4,000	13,000	3,968	4,409	2,205
Defensive armament	8 × 0.50 in. 1 × 0.30 in.	9 × 0.303 in.	1 × 20 mm. 6 × 7.9 mm.	2 × 12.7 mm. 2 × 7.7 mm.	2 × 20 mm. 4 × 7.7 mm.

**TABLE II: MITSUBISHI G4M PRODUCTION AND GOVERNMENT ORDERS, 1940-5**  
(Source: Report of the Second Japanese Demobilization Bureau)

	<b>Fiscal Years<sup>1</sup></b>	<b>FY 1940-1</b>	<b>FY 1941-2</b>	<b>FY 1942-3</b>	<b>FY 1943-4</b>	<b>FY 1944-5</b>	<b>Apr.-Aug. '45</b>	<b>Total</b>
First quarter	—	41	93	168	219	105	—	—
Second quarter	—	53	84	171	265	7	—	—
Third quarter	12	75	112	173	277	—	—	—
Fourth quarter	13	82	148	152	164	—	—	—
Total production	—	25	251	437	664	925	112	2,414 <sup>2</sup>
Number of aircraft ordered during fiscal year	—	101	300	434	661	945	370	2,811

<sup>1</sup>The Japanese Fiscal Year starts on April 1 and ends on March 30. Thus, for example, the first quarter of 1940-1 covers the period April 1, 1940 to June 30, 1940.

<sup>2</sup>Data in this table includes all production G4M aircraft but excludes the two 12-Shi prototypes and the 30 G6M aircraft.

**TABLE III: MAJOR MITSUBISHI G4M UNITS AND MAJOR OPERATIONS BASES**

<b>Unit<sup>1</sup></b>	<b>Year</b>	<b>Major Bases of Operation</b>	<b>Attached to:</b>
1st Kokutai (Naval Air Corps)	1941 (from Apr. 1)	Kanoya, Hankow, Kanoya, Tainan, Jolo, Kagi.	21st Koku Sentai (Air Flotilla)
	1942 (until Mar. 31)	Tainan, Davao, Kendari, Ambon, Truk, Rabaul.	21st Koku Sentai
	1942 (from Apr. 1)	Rabaul, Tarao, Mili.	24th Koku Sentai
	1942 (Oct. 31)	Redesignated 752nd Kokutai.	
4th Kokutai	1942 (from Feb. 10)	Truk, Vunakanau, Rabaul, Lae.	24th Koku Sentai
	1942 (from Apr. 10)	Vunakanau, Lae, Surumi, Truk, Kisarazu.	25th Koku Sentai
	1942 (Oct. 31)	Redesignated 702nd Kokutai.	
701st Kokutai	1942 (Nov. 1)	Redesignated from Mihoro Kokutai.	
	1942 (from Nov. 1)	Tinian, Roi and Vunakanau.	22nd Koku Sentai
	1943 (until Mar. 15)	Vunakanau.	22nd Koku Sentai
	1943 (Mar. 15)	Inactivated on March 15, 1943.	
702nd Kokutai	1942 (Nov. 1)	Redesignated from 4th Kokutai.	
	1942 (from Nov. 1)	Kisarazu.	25th Koku Sentai
	1943 (until Dec. 1)	Kisarazu, Rabaul, Baran, Buka.	25th Koku Sentai
	1943 (Dec. 1)	Inactivated on December 1, 1943.	
703rd Kokutai	1942 (Nov. 1)	Redesignated from Chitose Kokutai.	
	1942 (from Nov. 1)	Rabaul, Wake, Roi.	24th Koku Sentai
	1943 (until Mar. 15)	Roi.	24th Koku Sentai
	1943 (Mar. 15)	Inactivated on March 15, 1943.	
705th Kokutai	1942 (Nov. 1)	Redesignated from Misawa Kokutai.	
	1942 (from Nov. 1)	Vunakanau.	26th Koku Sentai
	1943 (until Aug. 31)	Vunakanau, Tinian.	26th Koku Sentai
	1943 (from Sept. 1)	Vunakanau, Tarao.	25th Koku Sentai
	1943 (from Oct. 15)	Tarao, Padang, Sabang.	28th Koku Sentai
	1944	Padang, Koebang, Saigon, Kendari, Koetaradja, Peleliu, Samaranga.	28th Koku Sentai
	1944 (Sept. 30)	Inactivated on September 30, 1944.	

the same British aircraft the G4M2 had superior performance on all counts but, whereas the Wellington was supplanted in the bomber rôle by four-engined aircraft, such as the Handley Page Halifax, no four-engined replacement for the G4M was ever put into quantity production by the Japanese.

The major shortcomings of the G4M series—with the exception of its G4M3 version which was too late to be operated in large numbers—were its comparatively ineffective petrol tank protection and its lack of armour protection for the crew which was the price Mitsubishi had to pay to meet the performance requirements for this aircraft. However, in the final analysis, it was not the G4M which failed the Imperial Japanese Navy during the last 2½ years of the war but rather the insufficient number of aircraft available to sustain large-scale operations far-ranging from

Ambon in the south to Japan in the north, and from the Solomons in the east to Malaya in the west. In this respect it should be remembered that the number of attack bombers available to this Service was fairly modest and attack bomber strength at representative dates was as follows:

December 1, 1941	376
April 1, 1942	277
April 1, 1943	486
April 1, 1944	291
April 1, 1945	516
August 15, 1945	218.

Obviously, with such small numbers of aircraft available the Imperial Japanese Navy was never able to mount 1,000-bomber operations similar to those of the British Royal Air Force Bomber Command and U.S. Eighth Air Force in Europe.

**TABLE III – continued**

<b>Unit<sup>1</sup></b>	<b>Year</b>	<b>Major Bases of Operation</b>	<b>Attached to:</b>
706th Kokutai	1945 (from Mar. 5)	Kisarazu, Matsushima.	Third Koku Kantai (Air Fleet)
707th Kokutai	1942 (Nov. 1) 1942 (Nov. only) 1942 (Nov. 30)	Redesignated from Kisarazu Kokutai Vunakanau. Inactivated on November 30, 1942.	26th Koku Sentai
721st Kokutai	1944 (Oct. 1) 1944 (from Oct. 1)	Activated as part of Yokosuka Naval District Hyakurigahara.	Rengo Kantai (Combined Fleet)
	1944 (from Dec. 20) 1945 (until Feb. 10) 1945 (from Feb. 10)	Hyakurigahara. Hyakurigahara. Tomitaka, Kanoya, Usa.	11th Koku Sentai 11th Koku Sentai Fifth Koku Kantai
722nd Kokutai	1945 (Feb. 15) 1945 (from Feb. 15) 1945 (from July 20)	Activated on February 15, 1945. Konoike. Konoike.	Third Koku Kantai Rengo Kantai
751st Kokutai	1942 (Oct. 1) 1942 (from Oct. 1) 1943 (until Sept. 1) 1943 (from Sept. 1) 1944 (until Mar. 4) 1944 (from Mar. 4) 1944 (July 10)	Redesignated from Kanoya Kokutai. Kavieng and Sabang. Kavieng and Tinian. Tinian and Vunakanau. Rabaul, Tinian, Peleliu. Peleliu, Davao. Inactivated on July 10, 1944.	21st Koku Sentai 21st Koku Sentai 25th Koku Sentai 25th Koku Sentai 26th Koku Sentai
752nd Kokutai	1942 (Nov. 1) 1942 (from Nov. 1) 1943 1944 (until Feb. 20) 1944 (from Feb. 20) 1944 (from July 10) 1945	Redesignated from 1st Kokutai. Kisarazu, Wake Island, Mili. Kisarazu, Paramushiro, Musashi, Chitose, Maloelap, Roi. Roi, Kisarazu, Chitose. Kisarazu, Chitose, Tateyama, Toyohashi, Misawa, Iwo Jima. Kisarazu, Iwo Jima, Katori, Miyazaki, Kanoya, Izumi. Izumi.	24th Koku Sentai 24th Koku Sentai 24th Koku Sentai 24th Koku Sentai 27th Koku Sentai Third Koku Kantai Third Koku Kantai
753rd Kokutai	1942 (Oct. 1) 1942 (from Oct. 1) 1943 1944 (until July 10) 1944 (July 10)	Redesignated from Takao Kokutai. Kendari, Koepang. Kendari, Koepang, Madioen, Chiriritan, Roi. Chiriritan, Roi, Toyohashi, Takao, Sorong. Digos, Peleliu, Kendari. Inactivated on July 10, 1944.	23rd Koku Sentai 23rd Koku Sentai 23rd Koku Sentai
755th Kokutai	1942 (Nov. 1) 1942 (from Nov. 1) 1943 1944 (until July 10) 1944 (July 10)	Redesignated from Wonsan Kokutai. Kisarazu. Roi, Taroa, Wake Island, Mili. Truck, Peleliu, Guam. Inactivated on July 10, 1944.	22nd Koku Sentai 22nd Koku Sentai 22nd Koku Sentai
761st Kokutai	1943 (July 1) 1943 (from July 1) 1944 (until Feb. 1) 1944 (from Feb. 1) 1944 (from July 10) 1945 (until Feb. 5) 1945 (Feb. 5)	Activated July 1, 1943. Kanoya, Kagoshima, Kasumigaura. Kanoya. Tinian, Peleliu. Kisarazu, Oita, Davao, Clark Field. Clark Field. Operation with Mitsubishi G4Ms terminated; later reactivated in Japan with Yokosuka P1Y1s.	First Koku Kantai First Koku Kantai 61st Koku Sentai First Koku Kantai First Koku Kantai
762nd Kokutai	1944 (Feb. 15) 1944 (from Feb. 15) 1944 (from June 15) 1944 (from Nov. 1) 1944 (from Dec. 20) 1945	Activated on February 15, 1944. Kanoya. Kanoya, Toyohashi, Matsuyama, Izumi, Shinchiku. Kanoya, Shinchiku, Miyazaki, Tinian, Clark Field. Kanoya. Converted to Yokosuka P1Y1s at Kanoya.	62nd Koku Sentai Second Koku Kantai Rengo Kantai 11th Koku Sentai
763rd Kokutai	1944 (Oct. 10) 1944 (from Oct. 10) 1945 (until Feb. 5) 1945 (Feb. 5)	Activated on October 10, 1944. Izumi, Takao, Clark Field. Clark Field. Operation with Mitsubishi G4Ms terminated.	Second Koku Kantai Second Koku Kantai

**TABLE III — continued**

Unit <sup>1</sup>	Year	Major Bases of Operation	Attached to:
765th Kokutai	1945 (Feb. 5) 1945 (from Feb. 5) 1945 (from June 15)	Activated on February 5, 1945. Nintoku, Tainan. Tainan.	First Koku Kantai 29th Koku Sentai
Kanoya Kokutai	1941 (from Oct.) 1942 (until Oct. 1)  1942 (Oct. 1)	Taichu, Thudamot. Thudamot, Davao, Kendari, Geloembang. Kisarazu, Sabang, Kavieng. Redesignated 751st Kokutai.	21st Koku Sentai 21st Koku Sentai
Kisarazu Kokutai	1941 (from Oct.) 1942 (until Apr. 10) 1942 (from Apr. 10) 1942 (Nov. 1)	Kisarazu. Kisarazu, Marcus Island. Kisarazu, Marcus Island, Vunakanau. Redesignated 707th Kokutai.	Yokosuka Naval Dist. Yokosuka Naval Dist. 26th Koku Sentai
Misawa Kokutai	1942 (Mar. 1) 1942 (from Mar. 1) 1942 (from Apr. 10) 1942 (Nov. 1)	Activated on March 1, 1942. Kisarazu. Kisarazu, Misawa, Saipan, Vunakanau. Redesignated 705th Kokutai.	Fifth Koku Kantai 26th Koku Sentai
Takao Kokutai	1941 (from Oct.) 1942 (until Oct. 1) 1942 (Oct. 1)	Takao. Jolo, Kendari, Koepang, Rabaul. Redesignated 753rd Kokutai.	23rd Koku Sentai 23rd Koku Sentai

<sup>1</sup>The units listed are those which mainly flew G4Ms on combat missions. Other units (e.g.: Genzan Kokutai) flew G4Ms for a brief period only; or, had G4Ms on strength along with several other types of aircraft (e.g.: Yokosuka Kokutai), or were training units (e.g.: 951st Kokutai), or operated G4Ms and G6Ms in a transport rôle (e.g.: 1021st Kokutai).

**TABLE IV: MITSUBISHI G4M SPECIFICATIONS**

	G4M1 Model 11	G6M1	G4M2 Model 22	G4M3 Model 34
Span (ft. in.)	82 0 $\frac{1}{2}$	82 0 $\frac{1}{2}$	82 0 $\frac{1}{2}$	82 0 $\frac{1}{2}$
Length (ft. in.)	65 7 $\frac{1}{2}$ $\frac{3}{4}$	65 7 $\frac{1}{2}$ $\frac{3}{4}$	65 7 $\frac{1}{2}$ $\frac{3}{4}$	63 11 $\frac{3}{4}$ $\frac{3}{4}$
Height (ft. in.)	19 8 $\frac{3}{4}$ $\frac{3}{4}$	19 8 $\frac{3}{4}$ $\frac{3}{4}$	19 8 $\frac{3}{4}$ $\frac{3}{4}$	19 8 $\frac{3}{4}$ $\frac{3}{4}$
Wing area (sq. ft.)	840.9	840.9	840.9	840.9
Empty weight (lb.)	14,991	15,432	17,990	18,409
Loaded weight (lb.)	20,944	20,944	27,558	27,558
Wing loading (lb./sq. ft.)	24.9	24.9	32.8	32.8
Power loading (lb./h.p.)	6.8	6.8	7.7	7.6
Maximum speed (m.p.h./ft.)	266/13,780	—	272/15,090	292/16,985
Cruise speed (m.p.h./ft.)	196/9,845	—	196/13,125	196/13,125
Climb (ft. in mins.)	22,965/18	—	26,245/30.40	22,965/20.16
Service Ceiling (ft.)	—	—	29,365	30,250
Maximum range (miles)	3,750	—	3,765	2,695

**TABLE V: YOKOSUKA MXY7 SPECIFICATIONS**

	Ohka Model 11	Ohka Model 22	Ohka Model 43B
Span (ft. in.)	16 9 $\frac{3}{8}$	13 6 $\frac{3}{8}$ $\frac{3}{4}$	29 6 $\frac{3}{8}$ $\frac{3}{4}$
Length (ft. in.)	19 10 $\frac{1}{2}$ $\frac{3}{8}$	22 6 $\frac{3}{8}$	26 9 $\frac{1}{2}$
Height (ft. in.)	3 9 $\frac{3}{8}$ $\frac{1}{2}$	3 9 $\frac{3}{8}$ $\frac{1}{2}$	3 9 $\frac{3}{8}$ $\frac{1}{2}$
Wing area (sq. ft.)	64.6	43.1	139.9
Empty weight (lb.)	970	1,202	2,535
Loaded weight (lb.)	4,718	3,197	5,004
Wing loading (lb./sq. ft.)	73.1	74.3	35.8
Maximum speed (m.p.h./ft.)	403/11,485	276/13,125	345/13,125
Terminal dive velocity (m.p.h.)	576	—	—
Range (miles)	23	81	173
Warhead (lb.)	2,646	1,323	1,764

**TABLE VI: Technical description of the Mitsubishi G4M2**

The Navy Type 1 Attack Bomber Model 22 was a large twin-engined, mid-wing medium bomber of all-metal construction.

**Wings:** Mid-wing cantilever monoplane with stressed-skin covering. Box spar construction of laminated, high-test aluminium alloy. Wings divided into a centre section, inner and outer wing sections and detachable tips.

Trailing-edge flaps on inner wing sections electrically operated with a crank for emergency manual operation. The flaps brackets were mounted perpendicular to the underside of the flap and hinged on brackets which extended back from the underside of the wing trailing-edge. The flaps did not ride back on a track but moved in an arc around these hinge points, thus providing a slot effect when extended.

Fabric-covered, Frise-type ailerons with trim tabs on outer wing sections. The ailerons had counterweights on both sides of all hinge points on their leading edge.

**Fuselage:** Elliptical, semi-monocoque, all-metal construction—mainly of high-test aluminium alloy—with flush-riveted, stressed-skin covering. Transparent nose and tail. Dorsal turret to rear of cockpit "greenhouse" and just forward of mainplane trailing-edge. Rectangular gun hatches amidships, on each side of the fuselage.

**Tail Unit:** Cantilever monoplane type, metal-skinned except for the aerodynamically-balanced fabric-covered elevators and rudder which had metal trim tabs.

**Undercarriage:** Fully retractable. Main legs retracted forwards into the centre part of the nacelles, with power transmitted by a series of shafts from an electric motor in the fuselage. The system could also be manually operated with a crank. The tail wheel was retracted by an electric motor fitted immediately next to the tail wheel housing. In emergency, a crank for manual operation was available.

**Powerplant:** Two 1,800 h.p. Mitsubishi MK4P Kasei (Mars) 21 14-cylinder air-cooled radials, each driving a 3.40 m. (11.152 ft.) Sumitomo 4-blade constant-speed metal propeller and developing 1,800 h.p. on take-off, 1,575 h.p. at 1,800 m. (5,905 ft.) and 1,410 h.p. at 4,800 m. (15,750 ft.).

**Fuel System:** Ten integral petrol tanks housed within the wings. Namely, two tanks in the centre section, three in each inner wing and one in each outer wing. Total capacity: 6,490 litres (1,428 Imp. gal.). With the exception of the outboard tank in each wing, the petrol tanks were covered with a self-sealing pad 28 mm. thick. The wing CO<sub>2</sub> (carbon dioxide) fire-extinguishing line surrounded the outboard tanks on three sides, giving additional protection. One unprotected oil tank was fitted in the wing leading-edge outboard of the engine nacelles.

**Crew:** The crew of seven comprised pilot, co-pilot, dorsal turret gunner, two waist gunners, tail gunner and navigator/bombardier. The bombardier also operated the nose machine-guns.

**Defensive Armament:** One ball-mounted 7.7-mm. Type 92 machine-gun in an electrically-powered, nose section revolving through 360° and a similar hand-held weapon which could be fired from either side of the nose. One 20-mm. Type 99 Model 1 cannon in an electrically-operated dorsal turret; the gunner was on a fixed platform and had to follow movements of turret. One hand-held 7.7-mm. Type 92 machine-gun in port and starboard waist hatch positions. One manually-operated 20-mm. Type 99 Model 1 cannon on slide mount in tail turret. All machine-guns provided with six 97-round drums of ammunition, the cannons with six 45-round drums. In addition there was a reserve 7.7-mm. Type 92 machine-gun carried on the bulkhead in the waist.

**Bomb Load:** Maximum bomb load of 1,000 kg. (2,205 lb.). Typical: One 800 kg. bomb or torpedo; or one 500 kg. bomb; four 500 kg. or twelve 60 kg. bombs.

## Series Editor: CHARLES W. CAIN

### ACKNOWLEDGEMENTS

The author extends his grateful appreciation to Mr. Allan Bovelt and to the staff of Mitsubishi Jukogyo K.K.; to the U.S. Library of Congress; the National Archives (General Services Administration) and to the Research Division of the Air Force Museum, Department of the Air Force, for their generous assistance in the preparation of this Profile.