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Tamiya Kawanishi N1K Kyofu (Rex)
by Mark Rossmann

Kawanishi N1K1 Aircraft
by Mark L. Rossmann

History: Kawanishi N1K Kyofu (Rex)

In 1940 the Japanese Navy initiated a seaplane project, out of which came the A6M2 Reisen seaplane and the N1K1-J Shiden seaplane fighter, which first flew in May of 1942. The Kyofu (Powerful Wind) was fast, and powerfully armed. By the time this plane made it to the field in 1943, Japans offensive capabilities turned to defense and only 97 were built. First prototype was a mid-wing monoplane with large floats, powered by a 1460 hp Mitsubishi MK4D Kasei 14 radial engine driving a pair of counter-rotating two-bladed propellers. The production version started in spring of 1943 and ceased production in March of 1944 and was changed to a 3 bladed Mitsubishi MK4E Kasei 15, 14-cylindar radial air-cooled engine, creating 1530 h.p. Max speed

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TCAH This Month

The monthly meeting will be held Saturday October 10, at Fleming Field, South St. Paul, beginning at 1:30 pm. Vendor baiting will begin about 12:30, so come early.

Airline Chatter
by Terry Love

Spanair, the Spanish charter and leisure travel airline, will replace 11 MD-82s and MD-87s with Airbus A-320s next year as their leases run out.

Southwest Airlines lost out on a bid for Frontier Airlines. But Southwest is on the hunt for another airline to buy. Are we seeing a new aggressive Southwest Airlines?

CSA, the Czeck Airline, lost $102.8 million in the first six months of 2009.

Air India lost a whopping $1.03 Billion for the fiscal year that ended recently. They have too much capacity for their markets.

JAL, Japan Air Lines, lost over $900 million last year, and they project to lose at least that much this year. Therefore, JAL plans to lay off about 5,000 more employees or about 10% of their workforce.

American Airlines has now retired all of their Airbus A-300s. American had 35 of them at one time.

Philippines Air Lines may cut more than a third of its 8000 employees due to a sharp decline in travel.

Airbus delivered its 4,000th A-320 family aircraft to TAM – the Brazilian Airline.

Boeing received 11 new orders for the Boeing 737-800 the first week of September, but 2 orders for the Boeing 777 were cancellations. Boeing did not disclose what airlines were involved. So far this year, Boeing has received 161 new orders and 91 cancellations for a net gain of 70 orders. Orders last year and the previous year were well into the 400s.

Embraer delivered its 600th Embraer 175 to LOT, the Polish Airline.

Delta Airlines has cut the following routes from their system due to lower demand – Atlanta to Seoul, Cincinnati to Frankfurt, Atlanta to Shanghai, Atlanta to Cape Town, Cincinnati to London, and New York to Edinborough.

Delta Airlines painted its first ex-Northwest Airlines Airbus A-330 and delivered it to the line on September 11, and it then entered service shortly afterwards.

Delta Airlines floated a stock sale recently for around $500 million. Delta likes the Asian network of old Northwest Airlines so much, that they want to expand its influence in Asia. Therefore, Delta is investing in JAL, Japan Air Lines, who has lost a lot of money in the last couple of years, and is in desperate need for cash. Delta is now the largest single share holder in JAL. Merger? Probably not. Meshing of schedules? Probably.

Airbus, as of September 15, has sold 147 airliners for 2009. After deducting cancellations, the total comes to 125. However, as of September 15, Airbus has delivered 320 airliners for the year. Rival Boeing has sold a net of 70 airliners, but they are generally larger in size than the Airbus airliners. Boeing has delivered 307 airliners through September 15 of this year. Boeing will deliver between 480 and 485 aircraft this year.

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304 mph at 18,700 ft., ceiling 34,645 ft., and range 1,036 miles. Armament was 2 20-mm cannon, 2 machine guns and up to 132 lbs. of bombs.

History: Kawanishi N1K1-J Shiden (George)

The Kawanishi Shiden may be the only case in history of a land based combat aircraft derived from a seaplane. This was a privately developed aircraft which was fast, well protected and heavily armed. It was among the few Japanese planes that could compete on the same level as the Corsair and Hellcat. The Shiden ("Violet Lightning") were built to the tune of 1,435 during the last two years of the war, but were used sporadically. Since this was a private venture the Japanese military was reluctant to acknowledge the virtues of the plane, even with its initial problems with landing gear and engine. Once ironed out the plane went into production in mid 1943. Production version was powered by a Nakajima NK9H Homare 21, 18–cylinder cylinder radial air cooled engine creating 1,990 hp. Max speed 363 mph at 19,335 ft., ceiling 41,010 ft., range 1,581 miles. Armament was 4 20-mm cannons, 2 machine gun and up to 264 lbs of bombs.

It is recognized this fighter matched the capabilities of the Hellcat and Corsair when in the hands of experienced pilots. It is noted that Lt. Kinsuke Muto engaged a dozen Hellcats in February 1945, downing 4 of them and driving the rest off.

History: Kawanishi N1K2-J Shiden Kai (George)

With the short comings of the original design, the Shiden Kai took to the air in December of 1943, sharing the same engine as its predecessor, but was different in a lowering to the wing system, to shorten and simplify the landing gear and the tail wheel. The redesign created an exceptional aircraft that the Japanese Navy accepted immediately as its standard fighter and fighter-bomber. Major production began in June of 1944. With the increase in U.S. bombing raids only 415 of this version could be built. Production version was powered by a Nakajima NK9H Homare 21, 18–cylinder cylinder radial air cooled engine creating 1,990 hp. Max speed 369 mph at 18,375 ft., ceiling 35,300 ft., range, 4881 miles. Armament was 4 20-mm cannons, 1100 lbs of bombs.

Construction: **N1K Kyofu Seaplane** is a Tamiya kit no. 61036. (Built 2005)

It was built OOB and as with all Tamiya kits they are well thought out and went together very straight

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forward. As noted a very nice dolly is included along with the mounting ladder for the climb to the cockpit.

Painting: Tamiya synthetic Lacquer spray-paints AS-2 Light Navy Grey and AS-1 Navy Green.

Decals: From the kit and represent No. 103, "Ohtsu" Kokutai. Decals adhered fine to the Tamiya paint, using Solve Set to snug them down. .

Construction: **N1K1-J Shiden** is an Otaki kit. (Built 1987)

It was built OOB and as with all Otaki kits the interior was lacking detail. However, the exterior works up well providing a drop tank and 3 sets of decals. The fit was good with minimal filler and sanding, instructions in Japanese, but the pictures can be followed if care is taken.

Painting: Tamiya acrylic Light IJN Navy Grey and IJN Navy Green hand painted with a brush.

Decals: From the kit and represent No. 151, "341st Air Group", fighting in Iwo Jima, Formosa and the Philippines, where the unit was destroyed. Decals adhered fine to the Tamiya paint, using Solve Set to snug them down.

Construction: **N1K1-2 Shiden Kai** is Hasegawa kit #J5. (Built 2005)

It was built OOB and is well designed with a great fit. The interior is adequate and the kit builds to a nice scaled version of the aircraft. Lower wings and upper wings sprayed separately then matched. Body sprayed separately then the wings were matched to the body.

Painting: Tamiya synthetic Lacquer spray-paints AS-2 Light Navy Grey and AS-1 Navy Green.

Decals: From the kit and represent No. 45, "343rd Air Group", established at the Matsuyama Air Base 12/44, fighting to the end of the war. Decals adhered fine to the Tamiya paint, using Solve Set to snug them down.

Conclusion: This series of aircraft kits is relatively easy to construct. If you like Japanese aircraft this series of aircraft were fun to build providing a unique history of a specific aircraft type.

References: For all aircraft, "Rand McNally Illustrated Guide to World War II Airplanes – Volume 2" and each of the kits decal information'

Kawanishi N1K George

by Peter Starkings
Reprinted from 'JAS Jottings', Vol. 5, No. 4, 1999
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Editor's Note: Gary Wenko, and through him Peter Starkings, have kindly granted permission for TCAH to reprint material originally published in JAS Jottings, The Quarterly Magazine of Japanese Aviation SIG/IPMS(UK). JAS Jottings is no longer published. This article nicely complements Mark Rossmann's kit review .

BACKGROUND

The Kawanishi N1K1-J *Shiden* (Violet Lightning) land based fighter was unique in that it was developed from the N1K *Kyofu* (Mighty Wind) floatplane fighter. The *Kyofu* was built in response to a 15-Shi specification issued in September 1940 for a floatplane fighter to cover amphibious operations in remote Pacific Island areas without airfields and where full scale carrier support could not be justified. Although many problems arising from its advanced design had been overcome by the time the Pacific War broke out some 14 months later, prototype construction had barely started. Nevertheless, Kawanishi engineers were already preparing design studies for a landplane version of it, reckoning that, with relatively few changes, estimated performance justified its development.

The Navy were not convinced, but Kawanishi management were and they decided to go ahead with the project as a private venture, designated Model X-1 Experimental Land-based Fighter. It is fortunate they did so because, through their foresight, a later production variant was destined to become one of the best JNAF fighters.

MODEL X-1

The original intention was to make as few alterations as possible to the N1K, apart from replacing floats with a retractable undercarriage. This in itself presented a major design challenge as the N1K/X- l mid-wing configuration meant long u/c legs which somehow had to be made shorter on retraction to fit available wing space. Kawanishi had no experience of retractable undercarriages anyway, but they solved the problem by enclosing part of the conventional oleo leg in what was effectively an outer oleo tube. Varying pressure in that lengthened the leg on u/c extension and shortened it on retraction. Ingenious, but it was to prove troublesome.

More trouble also came from fitting the X-1 with a Nakajima 1,820hp Homare 11 engine driving a four bladed propeller, in place of the N1K's Mitsubishi 1,460hp Kasei 14 engine. On the other hand, changing combat flap operation from hand (N1K) to fully automatic (X-1) greatly improved handling characteristics. Armament comprised two fuselage mounted 7.7mm Type 97 machine guns and two 20mm Type 99 Model 1 drum fed cannons in underwing gondolas.

Despite ongoing development problems with the N1K prototype, which did not fly until May 1942, the X-1 prototype made its maiden flight a mere seven months later. But the Navy were not impressed because they had already accepted the Mitsubishi J2M2 *Raiden* as their first land based interceptor fighter in October 1942. Also, adding insult to injury, they then also instructed Kawanishi to design a new interceptor fighter (J3K) to specification 17B-Shi in competition with Mitsubishi (J4M), followed by a derivative of it (J6K) to specification 18B-Shi in early 1943.

If that were not enough discouragement already to Kawanishi, X-1 flight trials revealed serious engine and undercarriage problems with overall performance falling below expectations. Even so, they strove to overcome these difficulties and three more slightly modified prototypes were completed by July 1943. Meanwhile, a series of events had begun in their favor. Even before starting the X-1 flight trials and learning the true extent of their troubles, Kawanishi were already redesigning the aircraft to correct perceived shortcomings (see N1K2-J later). The potential there fortunately captured the Navy's attention and in the Spring of 1943 they agreed to sponsor this work, cancelling the J3K and J6K projects.

There is little doubt that worries over quickly resolving increasing problems with the *Raiden* prompted the Navy's change of heart. As these increased they even went so far as to accept one prototype X-1 in July 1943 for test purposes. Service pilots confirmed Kawanishi's findings and also complained of poor workmanship for good measure. However, three factors were to rescue the X-1 from oblivion. Firstly, the war situation demanded an increased number of interceptor fighters to match the performance of U.S. Corsairs and Hellcats; secondly, in spite of shortcomings, the X-1 had a top speed slightly faster than the current A6M5 and an overall performance better than the troublesome slightly faster *Raiden;* lastly, Kawanishi were in any event developing a Navy sponsored redesigned version of it.

Shortly after their X-1 tests the Navy decided to bite the bullet and also sponsor that as an interim step pending completion of the redesigned version. They assigned staff to take responsibility for development of what then became known as the N1K1-J and N1K2-J Interceptor Fighters.

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MODEL 11 (N1K1-J)

A reliable summary of N1K1-J development is difficult because of varying information given in English and Japanese reference sources, lack of variant photos (especially reliably captioned) and variant production figures. The following information is based on the most consistent details found within the sources.

Manufacture of more prototypes and some pre-production aircraft commenced almost immediately after Navy involvement. Kawanishi and naval personnel worked hard to correct deficiencies and improve successive prototypes, culminating in a "definitive" N1K1-J by the end of 1943. Compared to the X-1 this had a 1,990hp Homare 21 engine fitted in a modified cowling with a larger top lip intake and new lower lip intake, an external oil cooler behind and below the left side cowling gills and individual exhausts. An additional 20mm type 99 Model 1 cannon and a 60Kg bomb rack were added just outboard of each gondola mounted cannon. The resultant aircraft was then formally authorized for quantity production as Navy Interceptor Fighter *Shiden* Model 11(N1K1-J), Allied code GEORGE.

By then, however, some 70 aircraft had already been produced and output was gaining momentum in spite of difficulties ensuring that all aircraft were retrofitted where necessary to the "definitive" standard. This was exacerbated by continued further minor changes arising from engine and undercarriage problems experienced during initial pilot training and familiarization, also by introduction of the Model I 1A in 1944.

MODEL 11A (N1K1-Ja)

On this main production variant there was provision for a 400L drop tank under the fuselage and the two fuselage machine guns were removed, perhaps to offset drop tank weight. Some sources suggest there was already drop tank provision on Model 11, in which case the machine guns might have been removed to simplify production or improve performance. Unfortunately it is virtually impossible to differentiate between Models 11 and 11A from photos (as captioned!) because machine gun ports do not seem to have been blanked over on the latter.

MODEL 11B (NIK1-Jb)

This variant was introduced probably in early 1945 and featured new strengthened wing sections outboard of the undercarriage identical to those on Model 21. Each housed two 20mm Type 99 Model 2 belt fed cannons within the wing and each was fitted with a 250Kg capacity bomb rack.

The wing gondolas were dispensed with and, according to some sources, it was now that the fuselage, machine guns were also removed! This might seem more logical given the additional firepower and extra weight of the new cannon and additional ammunition carried for them, but then what was the difference between the -J and -Ja? Another unexplained mystery with the -Jb is the squared off tailplane tips of late production examples, a feature not incorporated on Model 2.

MODEL 11C (N1K1-Jc)

A small number of Model 11B aircraft were converted to specialized fighter-bombers with racks for two 250Kg bombs under each wing.

EXPERIMENTAL MODELS

A handful of Models IIB for use on suicide attacks were fitted with a ventral pannier housing a 250Kg bomb and six air to ground unguided rocket bombs. One Model 11 was fitted with a solid propellant rocket booster under the fuselage.

MODEL 21 (N1K2-J)

Redesign of Model 11, primarily undertaken to obviate need for the long, complex u/c resulted in an almost completely new aircraft. Wings were moved down to the bottom of the fuselage and a conventional retractable type u/c fitted: The fuselage itself was made slimmer and 0.46M longer with a revised shape tailfin: The Homare 21 engine was retained in spite of its shortcomings as it was now a Navy standard type: A more streamlined cowling was fitted to the first prototype (see P.10), but the Model 11 cowling was retained thereafter for production standardization, although with an internal oil cooler and a shallow ventral air intake for it: Armament was as described under Model 11B and definitely without fuselage machine guns as the outlets were blanked over!

Whilst Model 2 incorporated parts common to the Model 1 where possible, it had some 30% less in total and was easier to build and maintain. The prototype first flew in December 1943 and was handed over to the Navy four months later. Seven more prototypes were ready by June 1944 and, even before completion of service trials, full scale production of Navy Interceptor fighter *Shiden Kai* Model 21 (N 1 K2-J) was authorized. Kawanishi had already begun tooling up in anticipation of this, but a series of teething troubles experienced during remaining service trials again necessitated modifications to be made to early production aircraft on the assembly line. Consequent delays were made worse by Allied bombing of component suppliers so that quantity production did not start until December 1944.

The first 100 production aircraft had a broad chord fin, thereafter narrow chord, but with a similar rudder. There were two Model 21 variants:

MODEL 21A (N1K2-Ja)

This variant was fitted with racks for two 250Kg bombs under each wing as on Model 11C.

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MODEL 21 (N1K2-K)

A small number of N 1 K2-J aircraft were fitted with a rear cockpit equipped with dual controls for pilot training, designated Navy Type Fighter Trainer *Shiden Kai Rensen* Model 21 (N1K2-K).

UNSOLVED PROBLEMS

Very shortly after N1K2-J production had been authorized, Kawanishi engineers turned their attention to the two principal remaining problems. These were center of gravity location adversely affecting some maneuvers and continued unreliability of the Homare 21 engine, which they proposed tackling with new Models as follows:

MODEL 31 (N1K3-J)

Model 31 had the fuselage section in front of the cockpit lengthened by six inches, thus moving the Homare 21 engine forward by a similar amount. At the same time opportunity was taken to increase armament by fitting two 13.2mm Type 3 machine guns in the additional fuselage space available. The Model is recognizable from cowling gun ports, the increased distance between exhaust outlets and wing leading edge and an additional vertical slot in front of the cockpit.

English sources state that two prototypes were completed in late 1944, but that Model 31 was not put into production. Japanese sources seem to suggest that either 201 were produced or that it was produced after the 201st Model 2, the latter implying a production total of around 224. Further information and photographs are still being sought to clarify these contradictions.

MODEL 32 (N1K4-J)

This was similar to Model 31, but powered by a 2,000hp Homare 23 engine with low pressure fuel injection. Two prototypes were completed in late 1944, but it was not put into production.

MODELS 41 (N1K3-A) and 42 (N1K4-A)

Carrier borne versions of Models 31 and 32 (designated Models 41 and 42, respectively) were also proposed. Model 41 got no further than the project stage, but one prototype Model 42 was built. Production plans were subsequently abandoned after decimation of the Japanese carrier fleet in late 1944.

FINALE

Notwithstanding the *Shiden Kai*'s excellent performance in normal combat situations, it was ineffectual in helping combat the growing B-29 menace because of its poor rate of climb. Two proposals were put forward in 1945 to remedy this by installing yet more powerful engines:

MODEL 25 (N1K5-J)

An N1K2-J airframe was fitted with a 2,200hp Mitsubishi MK9A engine enclosed in a new cowling. One nearly finished prototype was destroyed in mid 1945 during B-29 raids.

UNKNOWN DESIGNATION

The second proposal was similar, but using a 2,200hp supercharged Homare 44 engine. This was still at the planning stage in August 1945.

COLORS AND MARKINGS

Although production *Shiden* aircraft were initially finished green/ grey, the majority of them and most, if not all, of the *Shiden Kai* seem to have been green/natural metal. Unfortunately, photos show *Shiden* wearing tail codes only, but *Shiden Kai* can be seen with fuselage stripes in various colors and, unusually, the individual aircraft number repeated in large figures on the fuselage Hinomaru as well. Modellers seeking a more flamboyant example should consider the N1K2-J first or sixth prototypes, which were finished overall orange with a black anti-glare panel.

AeroMaster transfer sheets provide a variety of tail codes, also some fuselage stripes and large figures. Yellowhammer Models (in 1/48th scale only) provide a smaller number of alternatives for all of these as well as a tail code for the above mentioned, 6th prototype.

REFERENCES

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#3- FAOW 2 (1971)
#4-KKF Monthly 2174-1/'75 Incl. and 3/'85
#5-Japanese A/C Pacific War, Francillon (1979)
#6-Maru Mechanic 43 (1983)
#7-Wydawnictwo Suisei N1K 1 /N 1 K2-J (1991)
#8-Model Art 304 (1991)
#9-KKF Illustrated 68/'93, 83/'95, 991'98
10-Asahi Journal l /4 (1993)
#11-FAOW 53 (1995)
#12 Delta MAS, UN Shiden Kai.

Directions to the Club Meeting Location

Where: South St. Paul Municipal Airport, a.k.a. Fleming Field, located on the southern extremity of South St. Paul, south of I-494, west fo Concord Street and East of Highway 52.

If coming from the western Twin Cities going east on 494:

- Exit at the 7th and 5th Avenue exit (Exit No.65)
- Turn right (South) on 7th Ave and go approximately .6 miles to a 4-way Stop sign. This is South Street W. To your left there will be a McDonald's; to your right front there will be a Walgreen's.
- Turn left (East) at the 4-way Stop onto
- South Street W and go approximately .6 miles. Along the way you will encounter three more Stop signs—the third Stop sign (Henry Avenue) will be a "T" intersection. At the "T" intersection on your left will be homes and on your right softball fields.
- Turn right (south) onto Henry Ave. and go approximately .2 miles toward the Fleming Field airport terminal building.

If coming from east Twin Cities on westbound 494:

- Exit at the 7th and 5th Avenue exit (Exit No.65)
- Turn left (South) on 7th Ave and go approximately .6 miles to a 4-way Stop sign. This is South Street W. To your left front there will be a small strip mall; to your right there will be an Amoco station.
- Turn left (East) at the 4-way Stop onto
- South Street W and go approximately .4 miles. Along the way you will encounter two more Stop signs—the third Stop sign (Henry Avenue) will be a "T" intersection. At the "T" intersection on your left will be homes and on your right softball fields.
- Turn right (south) onto Henry Ave. and go approximately .2 miles toward the Fleming Field airport terminal building.

The terminal is on the right with parking available.

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The Aero Historian is published montly by the Twin City Aero Historians, Inc., a joint chapter of the American Aviation Historical Society and International Plastic Modelsers Society/USA, for members and readers as part of their annual dues or fees.

The group is open to aviation enthusiasts from teenagers on up who are interested in aviation modeling, photography, collecting, art and writing. For more information contact Dave Nelson at 651-765-1914.

The Twin Cities Aero Historians (TCAH) meet the second Saturday of every month at 1:30pm.

See above for the new meeting locations and directions.

Mail Newsletter material and address changes to the treasurer.