

The 14 mm 14-Shi Machine Gun of the Imperial Japanese Navy

Author Evgeny Aranov, edited by Anthony G Williams

At the beginning of the 1940s, Japanese naval aviation was equipped with relatively advanced combat aircraft. In contrast, their gun armament was in need of improvement, being Japanese versions of the British Lewis (Type 92 Flexible) and Vickers (Type 97 Fixed) 7.7 mm machine guns and the low-velocity 20 mm Oerlikon FF (Type 99-1) in 20 x 72RB calibre. Their cyclic rates of fire were comparatively low and the API blowback operation of the Oerlikon did not allow it to be synchronised to fire through the propeller disc, seriously reducing its combat value.

As a result, *Kaigun Koku Hombu* - the technical department of the headquarters of the Imperial Japanese Navy (IJN) - followed the Army (IJA) in the search for more effective aircraft weapons. In April 1940 the IJN prepared technical specifications for new naval equipment, including the development of an aircraft heavy machine gun (HMG), and designated these 14-Shi (the 14th year Shōwa period of the reign of Emperor Hirohito). The specification for this did not detail the exact parameters of the weapon; however, there was a preference for using the 13.2 x 99 cartridge of the 13 mm Type 93 (Hotchkiss) naval anti-aircraft machine gun already in service.

The IJA had been engaged in the development of automatic weapons since the 1920s and had at its disposal experienced design teams led by Kijiro Nambu and Masaya Kawamura, but the IJN did not enjoy such resources. As a result, the task of creating a new HMG was focused first of all on copying Western systems. Consideration was given to copying the .50 inch Browning M1921 captured in China (12.7 x 99 ammunition) and the Italian 12.7 mm Breda-SAFAT and Scotti machine guns (both using the export version of the Vickers .5 inch cartridge: 12.7 x 81SR). The Scotti guns were referred to as "*Izoda*" evidently meaning, in the Japanese transliteration of the name, the Italian machine gun maker Isotta Fraschini, which held the Italian licence to make Scotti's designs.

The IJN considered modifying the design of the 13 mm Type 93 to produce an aircraft version (as Hotchkiss themselves were trying to do), but this was dropped due to the exorbitant weight and low rate of fire, plus the lack of experience of Japanese naval engineers to make the radical changes necessary.

In addition to foreign weapons, the Japanese tried to create an original model. The new company *Dai Nihon Heiki kaihatsu K.K* in Tomioka, which was engaged in the licensed production of Oerlikon guns under the leadership of Kazuhiko Ishihara, developed in spring 1940 a 14 mm version of the Type 99-2 gun (a licensed copy of the Oerlikon FFL: 20 x 101RB calibre) which was submitted for the 14-Shi tender (the actual calibre was 14.5 mm, but the IJN rounded down HMG and larger calibres to the nearest whole number). Looking ahead, it should be noted that since this weapon was not adopted, it did not receive a separate designation, being referred to in Japanese documentation as a "14 mm 14-Shi machine gun", which can be translated as "Experimental sample 14th year of the Showa era".

By 1940, the 20 mm Type 99-2 was being planned for production at the Tomioka factory and the engineers were soon struggling with the teething problems of the new weapon. Partly for this reason, there was neither experience nor opportunity to carry out a major modernisation of what were already established weapons. An analysis of the prospects for scaling the Oerlikon system to the "machine gun calibre" showed that it would be possible to obtain weapons with a calibre not less than 14.5 mm without a significant change in the construction of the gun and cartridge being required. But even in this instance, with the same 20 x 101RB cartridge case simply necked-down to 14.5 mm, the changed internal ballistics needed a proportional change in the weight of the bolt and the strength of the return spring.

19. 14mm Experiment 14 Aircraft Cannon Ammunition



From 1939 to July 1942, the Dainippon Weapons Manufacturing Co. Ltd (Dainippon Heiki K.K.) experimented with a Flexible Machine-gun for Naval aircraft use, termed the Experiment 14, one of which still survives¹⁴³. It was built at Dainippon's Tomisha Weapons Plant. Although the gun itself is marked as 14mm, the projectile of at least one of the dummies that came with it is 15mm in diameter and may be the 20mm necked down to 15mm from a Type 99 Mark 2 case mentioned in a wartime report¹⁴⁴.

No live ammunition has been found, but there are three types of dummy known, in solid brass (illustrated), one in steel and one in wood.

Approximate dimensions (taken from specimen illustrated):

Overall length:	151 mm
"Case" length:	100 mm
Base to shoulder:	69 mm
Base to neck:	87 mm
"Driving band" diameter	15.5 mm
"Projectile" diameter	15 mm

Fig. 147 14mm Experiment 14 brass dummy

*Extract from Ken Elks's books **Japanese Ammunition 1880-1945***

In October 1940, the working design of the 14.5 mm 14-Shi machine gun was approved for manufacture. On March 14, 1942, the prototype, equipped with a 100-round drum magazine, went on trial. As mentioned above, the machine gun used a 14.5 x 100RB cartridge with a leading driving band diameter of 15.5 mm. The projectile weighed 44.7 grams and had an MV of 970 m/s (21,000 J energy). The gun, without magazine, weighs 28 kg. It is 164 cm long and 20 cm wide and tall, with a barrel length of around 100 cm.



Photo of the only known 14 mm gun courtesy of the Kentucky Historical Society Museum

The rate of fire of the gun was rather low at only about 630 rpm, but this was considered to be sufficient, since the situation with regard to the competing HMGs was even worse. In mid-1941, the Scotti was dropped as not being reliable enough; the Breda SAFAT was considered too heavy; and the Browning M1921 was rejected due to the non-standard cartridge and also the high weight. One can only speculate why the IJN did not adopt the IJA's Ho-103 gun, which was also based on the M1921 but scaled-down to suit the 12.7 x 81SR calibre adopted from Italy.

The problem of a non-standard cartridge obviously also applied to the 14 mm Oerlikon, and was the primary reason for the rejection of this interesting project. In addition, the 14-Shi machine gun, like all of Oerlikon-type systems, could not be used as a synchronised weapon, although it appears that it was initially considered only as a weapon for defensive turret installations anyway (by the time of the termination of work in August 1943, the project also had a belt-fed version of the 14.5 mm machine gun designed for wing installation).

In summary, the sluggish work on the creation of a heavy machine gun for naval aviation lasted three and a half years without any significant progress. Initially, the original idea of developing weapons chambered for standard 13.2 x 99 cartridge fell foul of the trivial inability of marine engineering personnel to quickly process for it numerous available foreign samples.

Part of this was due to the purchase of a licence for the production of the MG 131 German machine gun. The agreement between the companies *Nihon Seikōsho KK* (Japan Steel Works Ltd) and Rheinmetall AG was signed in May 1941, and by the end of the year not only the documentation but also the necessary equipment for the production of machine guns were obtained, and a production line for the 13 x 64B cartridges. It is typical that the MG 131 was not even considered until mid-1942 as a competitor for the other HMGs. And only the colossal losses of Japanese naval aviation in the battles of Guadalcanal, showing the complete defencelessness of Japanese bombers from attacks by American aviation, showed the urgent need for a heavy turret machine gun. As a result, as a temporary measure, the German machine gun was adopted for defensive installations under the designation 13 mm Type 2, to supplement the use of the heavy 20 mm Type 99 guns. But, the "temporary measure" eventually dragged on until the end of the war, as Japanese industry did not offer anything better for naval turret installations.

By the end of the war, Japan's naval aviation did receive an aircraft machine gun in 13.2 x 99 calibre, which they had wanted since 1940. The Browning AN-M2 modified to fire the 13.2 mm cartridge came from *Nihon Seikōsho KK*, whose lead designer was the famous Masaya Kawamura. They quickly modified the Browning (only a barrel change was needed) and produced it from the beginning of 1944 as a fixed weapon under the designation 13 mm Type 3. However, there was not enough time to produce a turret version of this gun. If not for the sluggishness of the Japanese administrative system, a 13.2 mm Browning could have been available to the IJN before the war.

Japanese Ammunition 1880-1945 by Ken Elks

Part 1: Pistol, Rifle and Machine-gun Ammunition up to 20 mm

Part 2: 20 mm to 40 mm

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80 The Street, Kingston, Canterbury, Kent CT4 6JQ, UK

email: solopublications@hotmail.com

With thanks to the Kentucky Historical Society Museum: <https://history.ky.gov>

Their gun is shown and described here:

<http://kyhistory.pastperfectonline.com/webobject/15F50017-CDB0-419F-BC72-717962659326>