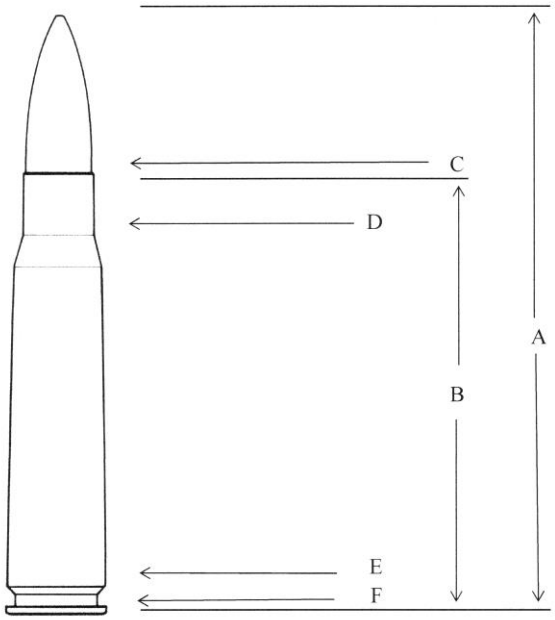
13.2mm Hotchkiss HMG (13.2x99) Cartridges

Francis C. Allan

The IJA issued Weapons Directive No. 398 in July 1920, which resulted in two parallel research and development efforts. The first effort was directed at producing, in IJA terminology, a Heavy Machine Cannon. It was originally intended to engage tanks, and aircraft at altitudes below 2,000 meters. Its planned high velocity was applicable to both vertical and horizontal applications. The specification was adjusted in 1931, directing that the weapon be intended for vehicle mounting. The designers relied heavily on the French HMG Model of 1929, including the use of its 13.2mm Hotchkiss (13.2x99mm) cartridge. Initially, both the HMGs and ammunition were purchased from France, with additional ammunition being purchased from Italy, before manufacture was initiated in Japan. Both the weapon and the ammunition were adopted by the IJA in 1932, when it was designated the "Type 92 Vehicle Mounted 13mm Machine Cannon -九二式車載十三粍機関砲." It armed the cavalry's Type 92 Combat Car, mounting an HMG in the forward extension, to the right of the driver, in the hull and had a turret-mounted light MG.[1]

The second research effort was actively begun in 1928 by importing and testing the British Vickers Class D .50 caliber Heavy Machine Gun, but that effort failed miserably, with short barrel life, poor accuracy and generally low quality of the weapon's parts. In April 1929, the IJA then sent a dual barrel anti-aircraft cannon specification requirement to the French Hotchkiss Company, which supplied a prototype in December of the same year, with the 13.2mm Hotchkiss cartridge again chosen. The Hotchkiss design functioned very well in various testing conditions. Additional specification modifications were made and, in January 1934, the design was accepted as a secondary standardized weapon "Type Ho 13mm Anti-Aircraft Machine Cannon (ホ式十三粍高射機関砲)." The cannon body, barrel, and receiver were all imported from Hotchkiss and were not manufactured domestically. The "secondary standard" classification, or 準制式 designation, was given to all imported, yet standardized weapons. The HO portion of the nomenclature (ホ) is based upon the first two letters of the Hotchkiss name, in recognition of the origin of the design – ホツチキス – *Hotchikisu*.



Characteristics:

The following basic details refer to the 13.2x99 ball cartridge. The figures were taken from the references noted in the bibliography. Maximum differences between the sources are noted in parentheses. All rounds have brass bottlenecked tapered cases, with GM-FMJ-P projectiles that are 61.7mm in length. Early loadings have Boxer primers, while later examples have Berdan primers.

(A) Cartridge length overall:	136.5mm (-.1)
(B) Case length:	99.1mm (-.1)
(C) Bullet diameter:	13.2mm (+.2)

[1] Although noted as a "car" in the language used during the 1930s for vehicles used by cavalry, this vehicle was actually a fully-tracked AFV that can be loosely classified as an ultra-light tank.

(D) Case neck diameter:	14.5mm (-.1)
(E) Case diameter (maximum):	20.1mm
(F) Rim diameter:	20.3mm (-.2)
Bullet particulars:	GM-FMJ-P
Bullet composition:	Mild steel
Bullet weight:	805.0gr (-3)
Bullet length:	61.7mm
Powder charge:	220gr
Powder type:	Smokeless nitro cellulose
Primer:	Brass Boxer or 2-hole Berdan
Muzzle velocity:	2,214 fps / 675mps*

* Reported muzzle velocities vary wildly, likely caused by the different weapons in which this ammunition was fired. The velocity listed here is from Labbett's *Military Small Arms Ammunition of the World, 1945-1980*.

This label is from a 1936-dated box of ten 13.2x99mm cartridges from Italy. The box reached the Japanese, which is indicated by the circular over-label that reads "Ball / 13mm" (普通彈/13). *(Photo - George R. Masters)*

The IJN adopted its own Hotchkiss weapon design in both single and dual mounts, which were widely employed throughout the fleet and on naval land installations. The IJN version of these weapons was designated "Type 93 13millimeter Machine Guns - 九三式十三粍機銃."[2]

During the war, the IJN decided more firepower was needed for their fighter aircraft and they produced a faithful copy of the U.S. Browning .50 caliber (12.7x99mm) HMG. However, since the 13.2x96mm cartridge was already in production in IJN arsenals, and that the cartridges were similar in most respects, they sensibly chambered the new weapon for the 13.2mm ammunition. The new belt-fed MG was adopted in 2603 (1943) as the "Type 3 MG - 三式十三粍固定機銃.

The 13.2x99mm cartridge was the largest small-arms ammunition in regular IJA use, providing much needed fire support to the infantry.

Ball – Labeled as "Type 92 Standard Ball Cartridges –九二式普通弾彈薬筒" in IJA terminology, the ball rounds have mild steel core bullets weighing 805 gr that were propelled by 220 gr of powder. The PA color code is black.

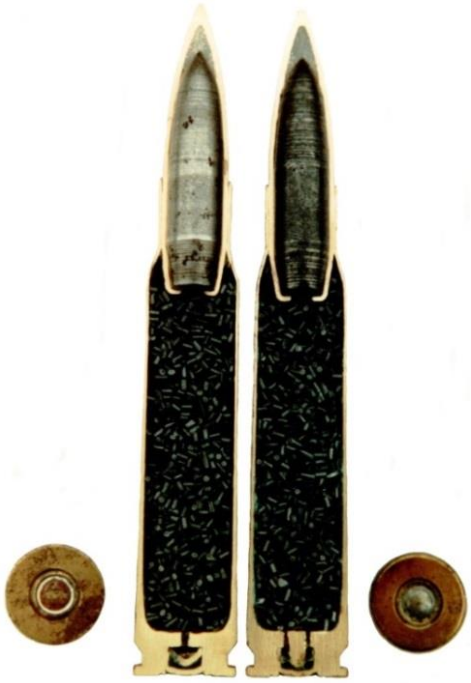
Tracer – The Tracer rounds also have projectiles with mild steel cores, and hard lead noses, but weigh approximately 772 gr, as there is a hole that had been drilled in the base of the steel core that is filled with a lighter tracer element. When fired, the tracer lasts approximately 3 seconds. Propellant weight is 224 gr. The red case mouth / neck band is 3mm in width.

[2] Note that the IJA referred to HMGs as "Machine Cannons - 機関砲", while the IJN labeled them "Machine Guns - 機銃", even when referencing the same weapon.

Three views of IJN 13.2x99mm Ball cartridges are pictured. Note the mild steel core. The headstamp is read clockwise from the 6 o'clock position: "ヨ / 1-I / 13". It indicates that it was made by Yokosuka (ヨ - "*yo*"), that it was made in 2601 (1941), in the first (I) third of the year (January-April), and that it is a 13mm cartridge (13.2mm). Note the black PA, indicating a Ball cartridge. *(Photo - George R. Masters)*

Armor Piercing – The AP variation is very similar to the Ball cartridge, but the core is steel, although the projectile weight remains at approximately 805 gr and the propellant at 230 gr. The PA color is White.

Incendiary (Incendiary Pattern 1) – A seldom encountered variation is the Incendiary round. It contains white phosphorus and has a light green case mouth band/sealant. Bullet weight is 795 gr and the powder charge is 224 gr. A known example is an IJN round from 1942 that was made at the Yokosuka Naval Arsenal as indicated by the character ヨ at the 6 o'clock position on the headstamp. The PA color is Green.



Armor Piercing examples are pictured. Note the white paint around the edges of the primers, circular primer crimps, and steel cores. The round on the left has a Boxer primer, while the round depicted on the right has a two-hole Berdan primer. *(Photo - George R. Masters)*

This photo illustrates the similarities between the Japanese 13.2x99mm AP cartridge on the left and the U.S. .50 caliber (12.7x99mm) M2 AP cartridge on the right. *(Photo - George R. Masters)*

Pictured above are three views of the 13.2x99mm Tracer cartridge. Note the tracer compound in the lower section of the projectile's mild steel body and the red neck sealant band. *(Photo - George R. Masters)*

High Explosive Incendiary (Incendiary Pattern 2) – Another variation that is quite rare is the Explosive Incendiary that the Japanese designated Incendiary Pattern 2, which was intended for aircraft use only. It is distinguished by a flat tip to the projectile, which weighs approximately 720gr. The case has a yellow PA, but a Purple PA is also listed in documents. It is similar in construction to other Japanese explosive incendiary rounds in various calibers. The bullet has three sections divided by brass cups. The forward portion contains mixture of RDX and PETN. The middle section contains a mixture of RDX and aluminum powder, separated from the lower section by a felt washer. The aft section consists of a lead plug contained within another cup. Detonation occurs when the projectile strikes a target and the lead plug compresses the forward sections, thereby causing sufficient heat for ignition.

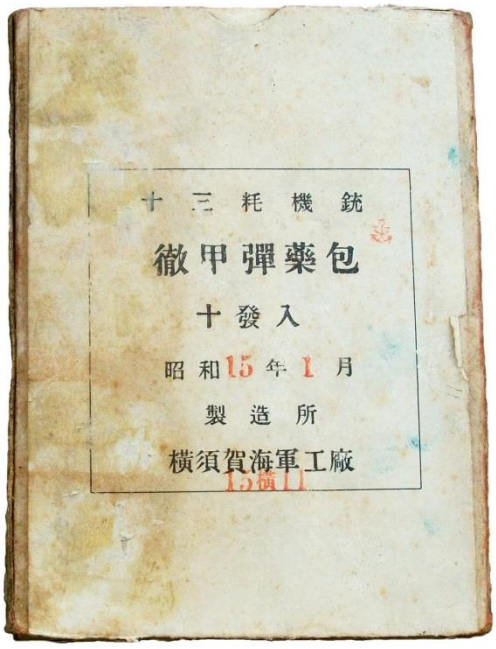
De-coppering – Although no examples have yet surfaced, Japanese documents indicate the existence of a de-coppering round. The bullet is steel, which has a recessed 7mm section of its lower body and the ogive is more rounded than other variations. It weighs 756 gr, and is propelled by 224 grains of powder.

Blank - Wood (Japanese Cyprus) MG blank weighing 988 gr overall, with a projectile weight of 30.9 gr and a powder charge of Mk. 2 Blank Powder weighing 170 gr. This full-charge blank allows firing fully automatic.

Naval Arsenal Production: The IJN loaded this HMG ammunition in the Toyokawa Naval Arsenal (豊川海軍工廠) and the Yokosuka Naval Arsenal (横須賀海軍工廠). Another small arms ammunition producer for the IJN was Japanese commercial manufacturer Asahi Weapons Manufacturing (旭兵器製造株式会社), but it is not known if the company manufactured 13.2 x96mm ammunition. An interesting difference exists between IJA and IJN versions of this cartridge, in that the IJN cases appear somewhat shorter, at 96mm. However, this may only be attributable to manufacturing tolerance differences.

Unlike the IJA, up until late 1943, the IJN applied headstamps to its ammunition in a three-element format. At the 6 o'clock position, a single Japanese character was stamped to indicate the manufacturing arsenal. In the case of Toyokawa, this was ト the *katakana* character "*to*". Yokosuka was represented by the *katakana* character ヨ – "*yo*". If Asahi examples in this caliber surfaced, and were made before late 1943, they would be represented by ア, the *katakana* character "*a*".

Clockwise the second entry is made up of two components; the first is a single digit Arabic number representing the year as expressed in the year dating from the foundation of the Japanese empire, which began in 600 BC and is called the Jimmu Era. Conveniently, this digit happens to correspond to the Western year. For example, 2601 in the Jimmu Era is 1941 on the Gregorian calendar, 2602 is 1942, etc. On early examples the second component of this entry is separated by a dash and it also relates to the date. It appears in the form of vertical lines, either Ⅰ, Ⅱ, or Ⅲ. Each vertical line represents a third of a year. (Refer to the pictured Ball example.) In later examples, this entry is a simple numerical reference to the month it was made. The third entry is a simple abbreviated indicator of the caliber; 13 here, indicates 13.2mm.



Comments:

The cartridges contained in this box are headstamped, which are read clockwise from the 6 o'clock position: "ヨ / 99-8 / 13". It indicates that it was made by Yokosuka (ヨ - "*yo*"), that it was made in 2599 (1939), in the 8th Month (August), and that it is a 13mm cartridge (13.2mm). The PA color on these AP rounds is white.

First line:

十 三 粍 機 銃 ⚓

13 millimeter Machine Gun ⚓

"13mm Machine Gun / Yokosuka Naval Arsenal Anchor"

Second line:

徹 甲 彈 藥 包

"Armor Piercing Loaded Cartridges"

Third line:

十 發 入

"10 Rounds Included"

Fourth line:

昭 和 15 年 1 月

"Showa 15th Year (1940) 1st Month (January)"

Fifth line:

製 造 所

"Manufacturing Plant"

Sixth line:

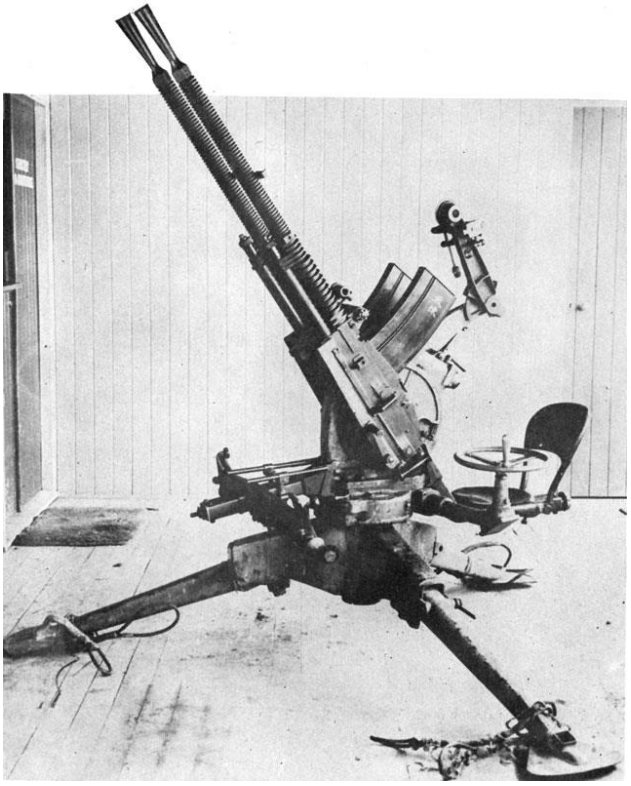
横須賀海軍工廠

"Yokosuka Naval Arsenal"

Seventh line:

15横11

"15th Year (1940), *YOKO*(suka) Lot #11"



13.2mm Type 93 Heavy Machine dual mount. *(U.S. Government photograph)*