

C.A.D.O. / 10501

RESTRICTED

SECTION B
SMALL ARMS AMMUNITION
&
AIRCRAFT CANNON
CARTRIDGES UP TO 25MM

JAPANESE
AMMUNITION LEAFLETS

THEY MUST NOT FALL
INTO ENEMY HANDS

KIRKEE

1945.

THIS LEAFLET MUST NOT
FALL INTO ENEMY HANDS

D. OF A. (INDIA)

SECTION B.

JAPANESE AMMUNITION LEAFLETS.

LEAFLET B 1

INTRODUCTION

DIVISION OF SECTION

This Section is intended to cover all Japanese Small Arms Ammunition and Aircraft Cannon cartridges up to 25 mm. calibre. Cartridges of calibres above 25-mm. will be dealt with in Section E, under Aircraft Ammunition.

2. The following division of this Section has been arranged tentatively and J. A. Ls. as they become ready will be issued as below:—

- B. 1—Introduction.
- B. 2—Cartridges, S. A., 6.5-mm. (.256-in.), Semi-rimless.
- B. 3—Cartridges, S. A., 7.7-mm. (.303-in.), Semi-rimless.
- B. 4—Cartridges, S. A., 7.7-mm. (.303-in.), Rimless.
- B. 5—Cartridges, S. A., 7.7-mm. (.303-in.), Rimless.
- B. 6—Cartridges, S. A., 7.92-mm. (.311-in.), Rimless.
- B. 7—Reserved.
- B. 8—Reserved.
- B. 9—Pistol and Machine Carbine Ammunition.
- B. 10—Reserved.
- B. 11—Cartridges, S. A., A. A., 12-mm.
- B. 12—A. C. Cannon Cartridges 19.7-mm. (.75-in.)—General Notes.
- B. 13—A. C. Cannon Cartridges 22.7-mm. (.5-in.)—Detailed Description.
- B. 14—Reserved.
- B. 15—Cartridges, S. A., 20-mm.—General Notes.
- B. 16—Cartridges, S. A., 20-mm. for type '97 A. T. machine gun.
- B. 17—Cartridges, S. A., A. A./A. T., for type '98 machine gun.
- B. 18—Cartridges, S. A., 20 mm., for type '99 Aircraft Cannon.
- B. 19—Reserved.
- B. 20—Reserved.
- B. 21—Cartridges, S. A., A. A./A. T. 25-mm.

STANDARDIZATION AND TYPES

3. If the Japanese have ever made any serious attempt in recent years to standardize small arms and small arm ammunition there is little evidence of it, the many different calibres and types in use by them in the present war. No country except perhaps Italy has anything approaching the number of different calibres and types of small arm ammunition used by the Japanese.

4. At the beginning of the century, following the example of other great powers, Japan adopted small calibre bore weapons and a cartridge somewhat similar to the U. S. Navy experimental 6-mm. (Lee) cartridge was introduced but, following the example of Italy and a number of other European countries, a calibre of 6.5-mm. (.256-in.) was standardized. Initially the bullet was round nosed but following the example of Great Britain (Mk. 7 Ball) and the U. S. A. (M. 1906) a pointed bullet was introduced at the same time (1904-06) that these countries adopted pointed bullets.

The British service cartridge (.303-in.) had a *rimmed* case while the American (.30-in.) had a *rimless* case. A somewhat similar position existed among the countries of Europe, e.g. Russia used a *rimmed* case, Germany a *rimless* case. The Japanese adopted a *semi-rimless* case; the only Service small arm semi-rimless case used by any power in the world. This form of head is a compromise, the success of which is questionable. Nevertheless Japan has adhered to it even in the change a few years ago to a larger calibre, i.e. 7.7-mm. (.303-in.).

5. The Japanese 6.5-mm. cartridge has a 138 grain bullet fully jacketed with a cupro-nickel or gilding metal envelope and lead core. It has been reported from American sources that two propellant loads are used for this cartridge. The standard cartridge being loaded to give about 2,700 f. s. muzzle velocity for rifles, while a slightly lighter load is used for cartridges intended for machine guns. All 6.5-mm. ammunition is issued in 5 round clips packed in small cardboard cartons each holding 15 rounds. A label on the carton states "38 Type rifle" and if the ammunition is reduced charge for machine guns there is a ϕ in a circle on the edge of the label. This machine gun ammunition is reported to give a muzzle velocity of about 2,400 f. s. The two types of ammunition are interchangeable for rifle or machine gun.

This reduced charge ammunition for machine guns is probably desirable owing to the type of mechanism employed which allows the breech to open with a high residual pressure leading to rupture of the case and occasional stoppages in the case of high velocity ammunition.

Although large quantities of 6.5-mm. ammunition have been examined at Kirkee only one propellant load has been found, 30 grains of square flaked graphited N. C. In the type Meiji 38 long rifle (about 30 in. barrel) this gave an observed mean velocity of about 2290 f. s. at 90 feet (muzzle velocity of the order of 2350 f. s.). If higher velocity 6.5-mm. ammunition does exist, it cannot have been used to any wide extent in the Burma theatre.

6. The change to the larger calibre of 7.7-mm. commenced shortly after 1930 and the 7.7-mm. *semi-rimless* cartridge was introduced for heavy machine guns. About 1939 a 7.7-mm. rifle and light machine gun were introduced but the cartridge for them was *rimless*.

7. It will be useful here to explain a point which has caused some confusion in regard to the interchangeability of 7.7-mm. *semi-rimless* and 7.7-mm. *rimless* cartridges. The 7.7-mm. *semi-rimless* cartridges are invariably packed for the Hotchkiss type (Type '92) 7.7-mm. heavy machine guns which are designed to take a *semi-rimless* cartridge. The protruding rim of the *semi-rimless* case of this cartridge will not fit properly in the recess of the bolt head of the 7.7-mm. rifle and light machine gun which are designed to take a *rimless* cartridge, and jams will occur if attempts are made to use this cartridge. On the other hand, however, the *rimless* cartridge can be used in the 7.7-mm. heavy machine gun without difficulty.

8. The change to a larger bore was not confined only to Japan, a number of countries have changed since the First World War. Noticeably Italy, which was changing to 7.65-mm. bore just before the present war. This change to a larger calibre is probably influenced by:—

(a) The need for greater ranging for medium machine guns and better striking energy at fighting ranges of A. P. ammunition.

(b) The greater facility with which the larger bullet can be used for A. P., incendiary, tracer and explosive roles.

(c) Standardization and the better prospect of obtaining machine tool gauges, etc.

9. Between 1930 and 1940 the Japanese adopted machine guns of Lewis and Vickers types taking .303-in. ammunition, termed 7.7-mm. *rimmed*. These guns are almost copies of the British and the ammunition has also been copied very closely. In addition much captured British guns and ammunition are used. The Japanese manufactured ammunition can be distinguished by the stamped base markings and coloured annulus, details of which are given in this J. A. L. This 7.7-mm. rimmed ammunition is fully interchangeable with British .303 in. ammunition although it may not function so well in automatic weapons.

10. German influence is apparent from about 1938 when aircraft machine guns of German design were introduced. The Japanese Type '98 A. C. machine gun is a copy of the well-known German 7.92-mm. M. G. 15 free (flexible) A. C. machine gun, while the Type '00 A. C. machine gun is similar to the Continental (Bren Type) L. M. G. Some of the 7.92-mm. ammunition received here for examination was of German and some of Japanese manufacture. The Japanese air force appears to use 7.92-mm. ball in A. C. machine guns unlike the Luftwaffe which normally uses only A. P. and semi A. P.

11. It should be noted that this 7.92-mm. ammunition is fully interchangeable with British 7.92-mm. B. E. S. A. ammunition, although it may not function so well in B.E.S.A. machine guns.

12. What we usually term a *medium* machine gun i.e. a machine gun mounted on a tripod for sustained fire, is usually termed by the Japanese as a *heavy* machine gun. The earliest heavy machine gun which is still in use appears to be the 6.5-mm. Type Taisho 3 (1914). This is a Hotchkiss type fed by a metal strip. In 1932 the 7.7-mm. semi-rimless Type '92 heavy machine gun was introduced, which follows generally the same lines as the 6.5-mm. Type Taisho 3.

13. In pistol calibres an 8-mm. (Nambu) cartridge (full jacketed bullet) is used for S. L. (semi automatic) pistols while a 9 mm. S. & W. type cartridge (unjacketed lead bullet) is used for revolvers. The former is an unusual cartridge, not used by any other Power. It is a bottle necked semi-rimless cartridge something like the .30 (sometimes termed 7.65-mm. Luger) Luger cartridge but considerably different in dimensions. It will be seen from the Summary that this is used in three different types of S. L. pistols. The M. V. is reported to be about 900 f. s. but it has not been possible yet to check this at Kirkee.

So far as is known there is only one type of revolver used, the Type Meiji 26 (1893). This is modelled on the old American .45 Smith and Wesson revolver and in appearance is very much like the British Service (Webley) revolver. The cartridge has a solid lead unjacketed 150 grain bullet, with a propellant charge of about 3 grains of a small greenish-gray pillow shaped N. C. powder. The bullet is seated deeply in the case over a leatherboard cup-shaped wad. The cartridge can be used from the .380-in. No. 2 pistol (British Service, Webley). Small trials using this weapon in .38-in. barrel gave a mean observed velocity at 30 feet of 517 f. s. The cartridge case of the Japanese revolver being slightly longer than the standard Smith and Wesson .38-in. revolver cartridge case will not fit the .38 Smith and Wesson revolvers or similar revolvers with a raised shoulder in the chamber. It is considered that the velocity obtained above in the No. 2 pistol is the same as that to be expected in the Japanese revolver, and M. V. of the order of 530 f. s. No Japanese revolver was available for trials.

The use of an unjacketed bullet by the Japanese is worthy of attention in view of the strong objections raised by the Germans and Italians to our use of unjacketed bullets in .455-in. or .380-in. cartridges. It will be recollected that Allied troops caught in possession of these cartridges were liable to be summarily shot.

14. Information on sub-machine carbine ammunition is vague. One main type of machine carbine only has been reported, a copy of the German Rothorn taking the standard 8-mm. (Nambu) pistol ammunition. Another report states that the carbines are of 7.63-mm. calibre; possibly taking a cartridge similar to the .30 in Mauser automatic pistol cartridge. Further information is awaited.

15. The 12.7-mm. aircraft cannon cartridge is a close copy of the Italian Breda cartridge, although the gun is reported to be of the Browning type. Captured 12.7-mm. ammunition has been of both Japanese and Italian manufacture. It is proved that this gun is also used in an A. A. A. T. role, and reports say it is used by the Japanese Navy for A. A. work. It is not likely to be very effective in either role owing to its low velocity.

16. A 13-mm. (sometimes described as 13.2-mm.) A. A., A. T. machine gun is known to exist. This is the Type '93 (Hotchkiss) which is thought to be an old design not widely used except perhaps in Home areas. Little information on the ammunition is available and no drawings or definite details have been received in Kirkee. No reports of its use in the Burma theatre have been received.

17. In the 20-mm. calibre there are four different weapons chambered for different types of cartridges. The largest cartridge is used for the Type '98 A. A./A. T. Machine gun; the length of the cartridge case is 5.6". The next largest is the Type '97 A. T. machine gun which, suitably modified, is reported to be used also as an aircraft cannon; the length of this cartridge case is 4.9". The next cartridge in size is that for the Type HO 5-20-mm. (Browning mechanism) aircraft cannon; the size of this cartridge case is 3.7". The smallest cartridge is used in the Type '99 A. C. cannon and more recent weapons similarly chambered; the length of the cartridge case is 2.8". This latter weapon appears to be widely used and samples of practically all types were captured in Assam and Burma. This machine gun is reported to be used also in a ground role for A. A./A. T. purposes or as light automatic artillery. Full details to assist the identification of each type are given in the summary, while the photograph at Plate D shows typical cartridges for the Type '97, '98 and '99 machine guns.

The 20-mm. ammunition for the type HO 5 aircraft cannon has only just been received, and it is not possible to include a photograph of it in this issue. Full details will be given as soon as possible in the detailed J. A. L.

18. A weapon whose role is similar to that of the 20 mm. Type '98 A. A./A. T. machine gun is the 25 mm. Type '96 A. A./A. T. Naval machine gun. Its cartridge is dealt with in the Summary and Plate D.

19. The Japanese also use a 30 mm. Naval machine gun/aircraft cannon equipment and the following ammunition is reported—Tracer; H. E./Tracer; H. E.; H. E./Incendiary; and A.P./H.E.

Little is known of the ammunition other than that it is of the Oerlikon type and that the shell has a pronounced bourrelet. The incendiary type is reported to have a white phosphorus container and small bursting charge. The fuze is of the rotor type. Further information is awaited.

HANDLING AND TRANSPORT

20. Generally speaking, Japanese small arm ammunition can be dealt with on the same lines as the equivalent British service types. Some points, however, require special attention:—

(a) Incendiary bullets in the 7.7-mm. and 7.92-mm. calibres are filled with white phosphorus. While there is no evidence to suggest that this phosphorus is not well sealed in the bullet it is reasonable to assume that this is not so well sealed as in the British type. In any case the equivalent W. P. British Bul. 4 type is disliked because of possible exudation and consequent fire risk. Any Japanese W. P. filled S. A. A. should, therefore, be isolated in storage and if there is any indication of exudation the rounds concerned should be dumped in deep water. It would be well to keep a receptacle handy filled with water for initial dousing. Further, if loose rounds are captured which have obviously been subject to adverse storage conditions immediate destruction, preferably by dumping in deep water, is desirable.

(b) In the 7.7-mm. and 12.7-mm. calibres the Japanese make use of an explosive bullet probably more for its observation value than for its explosive effect). This bullet is filled with P. D. X. and P. E. T. N. in the nose and is functioned by a pointed brass hollow cone also filled with P. D. X. and P. E. T. N. Again, there is no evidence to suggest that this bullet is unduly sensitive but careful handling is advisable. A report from the South West Pacific refers to incendiary and explosive types of bullets requiring an extremely small amount of heat to ignite and that cases have occurred of rounds exploding in storehouses or when lying loose in the open. It is thought that this is unlikely to happen with ammunition in good condition and which is stored in reasonably cool storage. Nevertheless this aspect must always be considered when dealing with these types.

(c) The Japanese use a number of different types of fuzed shell in 12.7-mm., 13-mm. and 20-mm. calibres. Generally speaking, these fuzes in good condition and properly stored present no abnormal risk. But against very severe handling and jolting might be sufficient to initiate the gaine which usually contains pellets of lead oxide etc. with no shutter or other safety device below.

Blind shells from these calibres however present serious risk. In practically all cases the fuze is probably fully armed and the strike point may even be resting in the detonator. Destruction *in situ*, whenever practicable, is strongly recommended. If they must be moved, use a long-handled shovel and guard, beating the shell very carefully, or use a vehicle towing some form of improvised spade, etc. The shell should be moved only as far as necessary before destroying it. Powerful explosives are used in these shell, and despite their small size the explosive effect is quite severe. Fragments may carry considerable distances. Cover should therefore, always be used.

(d) It must be remembered always that small arm ammunition lends itself readily to use as a "booby trap" with a considerable nuisance value at the least. For instance, it is not at all difficult to fill the case of a 6.5-mm. or 7.7-mm. cartridge with high explosive and to fit a small detonator in line with the cap. What happens when the round is fired is quite obvious. If Japanese ammunition is to be used by friendly troops it is desirable to use ammunition from original packages, or ammunition which it is reasonable to suppose is not likely to be "booby trapped". Actually, so far as is known, no instances of cartridge being booby trapped in this way have been reported. It is, however, a possibility, even in enemy hands.

21. From the above there is little need to emphasize how unwise it is for any one to retain rounds, bullets, cannon shell and small fuzes etc. as souvenirs. Nevertheless, these items have a great attraction for troops, and I. O. Os, and Engineer officers can do much to discourage this practice by emphasizing the dangers involved whenever an opportunity occurs.

IDENTIFICATION

22. As explained above the Japanese use many calibres and types of small arm ammunition and to assist identification the following Plates and Summary are included at the end of this J. A. L.:—

**PLATE A.—DETAILED DRAWINGS OF 6.5-mm., 7.7-mm.
SEMI-RIMLESS AND 7.7-mm. RIMLESS CARTRIDGES.**

In addition to the types of 6.5-mm. cartridges shown, three other types have since come to light:—

(i) A blank cartridge which has a crimped mouth somewhat similar to the British service; Blank, .303-in. L, Mk. 5 round.

(ii) A hollow pink paper bullet which is presumably a blank cartridge used to function machine guns similar to the British service bulletted Blank, .303-in. L, Mk. 7.

(iii) A tracer round, of which very little details are available.

In the 7.7-mm. rimless cartridge additional types of A.P., tracer, etc. have since been found, and these are described briefly in the Summary.

**PLATE B.—DETAILED DRAWING OF 7.7-mm. RIMMED, 7.92-mm. RIMLESS
AND 8.0-mm. RIMLESS.**

The 7.7-mm. rimmed cartridges are direct copies of British .303-in. cartridges. The Japanese appear to copy these with great accuracy, even to the extent of securing the bullet by indents at mouth of case and using a coloured annulus to indicate the type of bullet, although the colours used do not agree with those used in the British service. They have not used their usual method of a coloured band at the junction of the mouth of the case and the bullet.

The sketch of the explosive round shown has been built up only from information received, and it seems reasonable that this is the ordinary explosive bullet from the 7.7-mm. *semi-rimless* cartridge loaded in a 7.7-mm. *rimmed* case. The cartridges, S. A., 7.92-mm. rimless are accurate copies of the German service cartridge, and in some cases cartridges captured have been of German manufacture. There is little doubt, however, that 7.92-mm. cartridges are also being made in Japan. The 8.0-mm. cartridge shown is used in other weapons than the Type '94 S. L. pistol. Full details are given in the Summary.

**PLATE C.—COMPARATIVE PHOTOGRAPH OF TYPICAL 6.5-mm., 7.7-mm.,
7.92-mm., 12.7-mm. AND 20.0-mm. CARTRIDGES.**

This photograph will assist quick identification of the different types, and the distinction between rimmed, semi-rimless and rimless cartridges can be seen clearly. Note that the colours pink, black, etc. refer to colour bands of paint or varnish at the junction of the mouth of the case and bullet. Note also the truncated tip of the 7.7-mm. explosive bullet, item 3.

**PLATE D.—COMPARATIVE PHOTOGRAPH OF 12.7-mm., 20.0-mm.,
25.0-mm. AND 37.0-mm. CARTRIDGES.**

This gives a good general idea of the relative sizes and appearance of the cartridges. No samples of the 20-mm. cartridges for the Type '97 machine gun have been examined at Kirkee and the photograph (item 6) has been built up from dimensions and other details reported. An explanatory chart is attached to this plate.

SUMMARY

23. This provides major details of the different types of S. A. A. cartridges and the weapons in which they are used in a form suitable for quick reference. Dimensions and markings have been included to enable cartridges to be identified readily. Fuller details will be given in the separate J. A. Ls. on each type of cartridge.

The "V" shown in the remarks column against certain items indicates that the ammunition has been examined at Kirkee and the details given are correct.

24. It will be useful to mention some characteristics of Japanese small arm ammunition which may help identification.

(a) Base markings appear to be omitted from 6.5-mm., 7.7-mm. *semi-rimless*, 7.7 mm. *rimless* and 12.7-mm. *semi-rimless* cartridges. In the case of the 7.7-mm. rimmed cartridge which, as mentioned earlier, is a copy of the British .303-in. cartridge, base stamping (see Plate B) has been used.

(b) Similarly, with the exception of the 7.7-mm. rimmed cartridge, no coloured marking on the annulus is used. Where coloured annuli or markings on the base of the cartridge concerned has probably been manufactured outside Japan or the coloured varnish is used only to waterproof the cap.

(c) The cap in 6.5-mm. cartridge is generally pressed in and secured by three stabs (or stakes). This stabbing is heavy in this calibre and the cap is sunk considerably below the base of the cartridge case.

(d) In all calibres of small arms brass caps appear to be used exclusively. No instance of copper caps have been found.

INTERCHANGEABILITY

25. To know what Japanese ammunition can be used in our weapons and what ammunition of ours can be used in Japanese weapons is extremely useful if not essential. Some brief information on this subject is, therefore, included.

To say that certain calibre of S. A. A. can be used in this or that weapon may be misleading and dangerous unless there is a proper understanding of what is meant by the term "interchangeable" in its application to the use of S. A. A. in weapons for which it was not manufactured. It will be useful, therefore, to make some brief remarks on this aspect:—

(a) The fact that two weapons may have the same calibre is no indication whatever that they take the same ammunition, i.e. that the cartridges manufactured for each are interchangeable. For instance, the Italian 6.5-mm. cartridge is quite unlike the Japanese 6.5-mm. cartridge and one cannot be used in the weapon intended for the other; they are *not interchangeable*.

(b) It may be taken as a sound rule that if the calibres stated are different they are definitely not interchangeable. There are one or two exceptions to this but they do not concern Japanese ammunition and can be ignored.

(c) The fact that a cartridge can, under certain conditions, be loaded and fired in a weapon other than that for which it is intended, even if it is of the same calibre, does not mean that it is interchangeable with the correct cartridge in any sense. For instance, the Japanese 6.5-mm. cartridge can be placed by hand in the chamber of the Italian 6.5-mm. rifle and with difficulty be fired. The combination, however, is dangerous and may result in a burst case and severe escape of gas to the rear. The .45-in. M. 1917 cartridge (Auto-Colt or Thompson Machine Carbine) can under certain conditions be fired in the .455-in. No. 1 pistol; the result can be a burst cylinder and serious injuries to the user. Other less dangerous combinations will occur where results may be only difficult loading, hard extraction, or bad accuracy, etc. None of these combinations is, however, correct and the cartridges are *not interchangeable*.

(d) For two cartridges to be called as interchangeable, they must be identical in the form of the case and dimensions, and give approximately the same ballistic performance, i.e. muzzle velocity and pressure, etc. Nevertheless, they may not feed properly from magazines or correct automaticity may be impossible in automatic weapons. It is, therefore, desirable to use the term "fully interchangeable" where it is known that the cartridges can be expected to behave the same under all conditions. Even so, trials are generally necessary to confirm that cartridges intended for one weapon will give one hundred percent correct functioning in another even though the design of both is the same.

26. A chart has been included at the back of Plate D to indicate, in a form for quick reference, what cartridges, if any, of the main belligerent Powers are interchangeable, or fully interchangeable, with Japanese S. A. A. cartridges. Detailed information on cartridges of other Powers can, if required, be obtained through the Director of Armaments, G. H. (1).

BULLET (TYPE).	WT. OF BULLET.	PROPELLANT.
BALL	138 GRs.	N.C.FLAKES 29.5 GRs.
GUARD	55 GRs.	N.C.FLAKES 27.3 GRs.
TRAINING	34 GRs.	BLACK POWDER 6.2 GRs.
RIFLE GRENADE.	-	-

CARTRIDGE, S.A., 6.5 MM., SEMI-RIMLESS

7.7 MM. RIMLESS.

BULLET (TYPE).	WT. OF BULLET.	PROPELLANT. (APPROX.)
BALL	203 GRs.	N.C.TUBULAR CORE 45
ARMOUR PIERCING.	162 GRs.	" " "
INCENDIARY	162 GRs.	" " "
EXPLOSIVE	162 GRs.	" " "
TRACER	155 GRs.	" " "

CARTRIDGE, S.A., 7.7 MM. SEMI-RIMLESS

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JAPANESE SMALL ARMS AMMUNITION.
FOR RIFLES & MACHINE GUNS.

BULLET. (TYPE).	WT. OF BULLET.	PROPELLANT.
BALL	173.6 Grs.	N.C. TUBULAR CORDS.
ARMOUR PIERCING	173.6 Grs.	" " "
INCENDIARY	133.2 Grs.	" " "
TRACER	130.4 Grs.	" " "
EXPLOSIVE ROUND	---	---

CARTRIDGE, S.A., 7.7 MM., RIMMED.

BULLET. (TYPE).	WT. OF BULLET.	PROPELLANT.
BALL	180 GRs.	N.C. FLAKES, 4.63 GRs.
ARMOUR PIERCING	182 GRs.	N.C. TUBULAR CORDS, 4.6 GRs.
INCENDIARY. (i).	182 GRs.	N.C. FLAKES, 4.6
INCENDIARY. (ii).	182 GRs.	" "

CARTRIDGE, S.A., 7.92 MM., RIMLESS.

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JAPANESE SMALL ARMS AMMUNITION.

FOR RIFLES, MACHINE GUNS & PISTOLS.

DIMENSIONS IN INCHES.

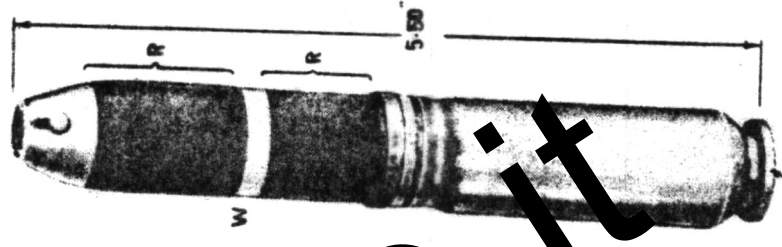
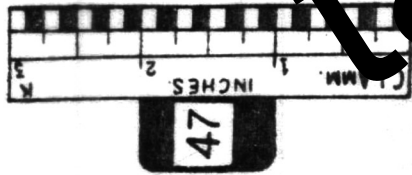
C.I. Arms. 5/1027. KIRKLE, MARCH '45.

G.P.O. FORM 1360.

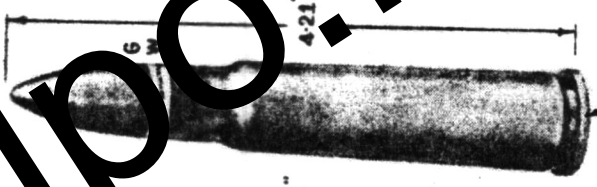
RESTRICTED.

KEY TO COLOUR BANDS:-

- P - PINK.
- W - WHITE.
- R - RED.
- G - GREEN.
- P.B. - PURPLISH SLACK.



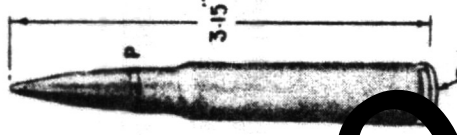
(9) 20MM. H.E./T. RIMLESS.
12.7 MM. A.P./T. SEMI-RIMLESS.



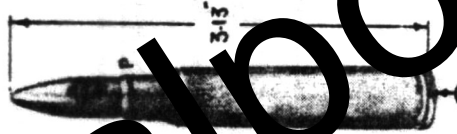
(8) 12.7 MM. INCENDIARY SEMI-RIMLESS.



(7) 7.92 MM. INCENDIARY RIMLESS.



(6) 7.7 MM. BALL RIMLESS.



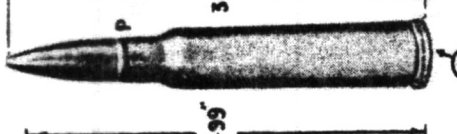
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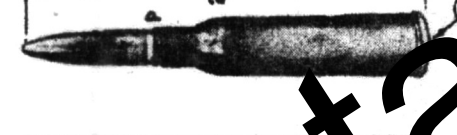
(4)



(3)



(2)



(1)

- 6.5 MM. BALL SEMI-RIMLESS.
- 7.7 MM. BALL SEMI-RIMLESS.
- 7.7 MM. EXPLOSIVE SEMI-RIMLESS.
- 7.7 MM. BALL RIMMED.
- 7.7 MM. BALL RIMLESS.
- 7.92 MM. INCENDIARY RIMLESS.
- 12.7 MM. INCENDIARY SEMI-RIMLESS.
- 12.7 MM. A.P./T. SEMI-RIMLESS.
- 20MM. H.E./T. RIMLESS.

— JAPANESE SMALL ARMS AMMUNITION. —
— FOR RIFLES & MACHINE-GUNS. —

RESTRICTED

STENCILLING
ON

SHELL - WHITE
CASE - BLACK or PURPLE INK

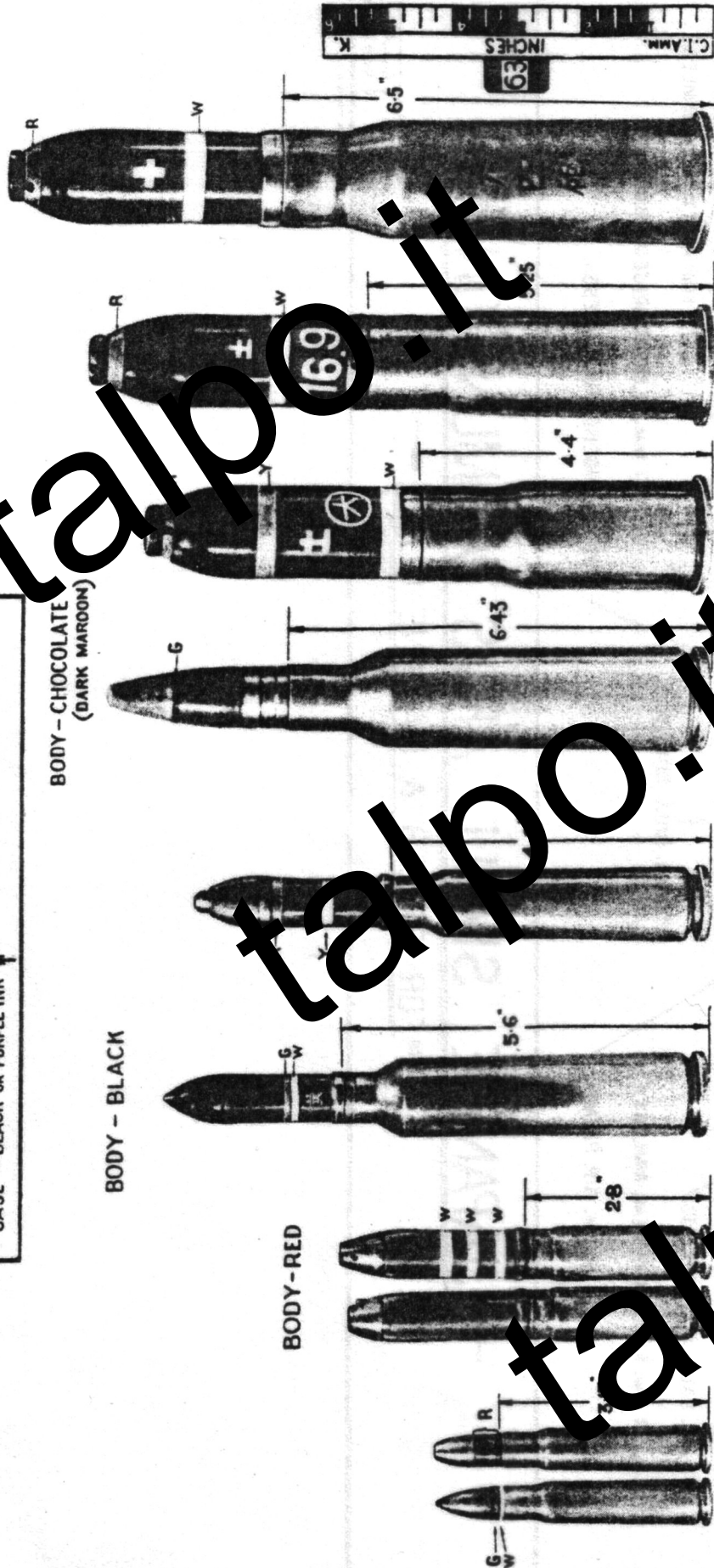
KEY TO COLOUR BANDS

R - RED Y - YELLOW
G - GREEN W - WHITE

BODY - CHOCOLATE
(DARK MAROON)

BODY - BLACK

BODY - RED



SKETCH BUILT UP
FROM DIMENSIONS, ETC.

- ①
- ②
- ③
- ④
- ⑤
- ⑥
- ⑦
- ⑧
- ⑨
- ⑩

JAPANESE AMMUNITION
COMPARATIVE CHART
 for
 2.7 MM., 20 MM., 25 MM. & 37 MM. AMMUNITION.

(Details given refer to actual rounds shown in photograph)

Serial No.	Calibre MM.	Type of Shell.	Type of Weapon.	Complete Round.		Shell (Det.		Weight Ozs.	Nature.
				Length Ins.	Weight Lbs. Ozs.	Length Ins.	Weight Lbs. Ozs.		
1	12.7	A. P./Tracer.	(a) 12.7-mm. Type 1, A.C. Cannon. (b) 12.7-mm. Type '89 A/C. Cannon.	4.21	... 2.92	1.75	... 1.25	0.29	Graphited tubular N. C. with diphenylamine.
2	12.7	H. E./Incendiary.	Do.	4.21	... 2.95	2	... 1.35	...	Graphited tubular N. C. and N. G. with carbamate.
3	20	H. E./Tracer (Self-destroying).	20-mm. Type '99 A.C. Cannon.	5.1	... 6.8	3.1	...	...	Graphited tubular N. C. with diphenylamine.
4	20	H. E./Tracer.	Do.	5.1	... 6.8	3.25	... 4.49	0.36	Do.
5	20	A. P./Tracer	20-mm. Type '98 A.A./A.T. machine gun.	5.4	15.57	3.16	... 5.55	1.05	Graphited tubular N. C. with D. N. T. and diphenylamine.
6	20	H. E./Incendiary.	20-mm. Type '97 A.T. machine gun, and its modification as an A/C. Cannon.	7.35	... 1.6	3.4	... 4.48	1.2	Graphited tubular N. C. with D. N. T. and diphenylamine.
7	25	H. E.	25-mm. Type '96 Naval A.A./A.T. gun.	9.2	1 8.27	2.94	... 8.85	3.7	Graphited tubular N. C. with D. N. T. and diphenylamine.
8	37	H. E. (nose fused).	Type Taisho 11 Infantry Cannon.	8.6	1 5	5.7	1 5.0	1.85	Loosely loaded flakes of graphited N. C. with diphenylamine.
9	37	H. E. (nose fused).	Type '91 tank mounted gun.	9.46	2 2	5.17	1 6.2	2.7	Rectangular flakes of graphited N. C. and diphenylamine.
10	37	H. E. (nose fused).	Type '91 A.T. gun.	10.71	2 7.2	5.17	1 5.2	4.3	Unitubular grains of graphited N. C. and N. G. with carbamate, contained in a silk bag. G. P. igniter.

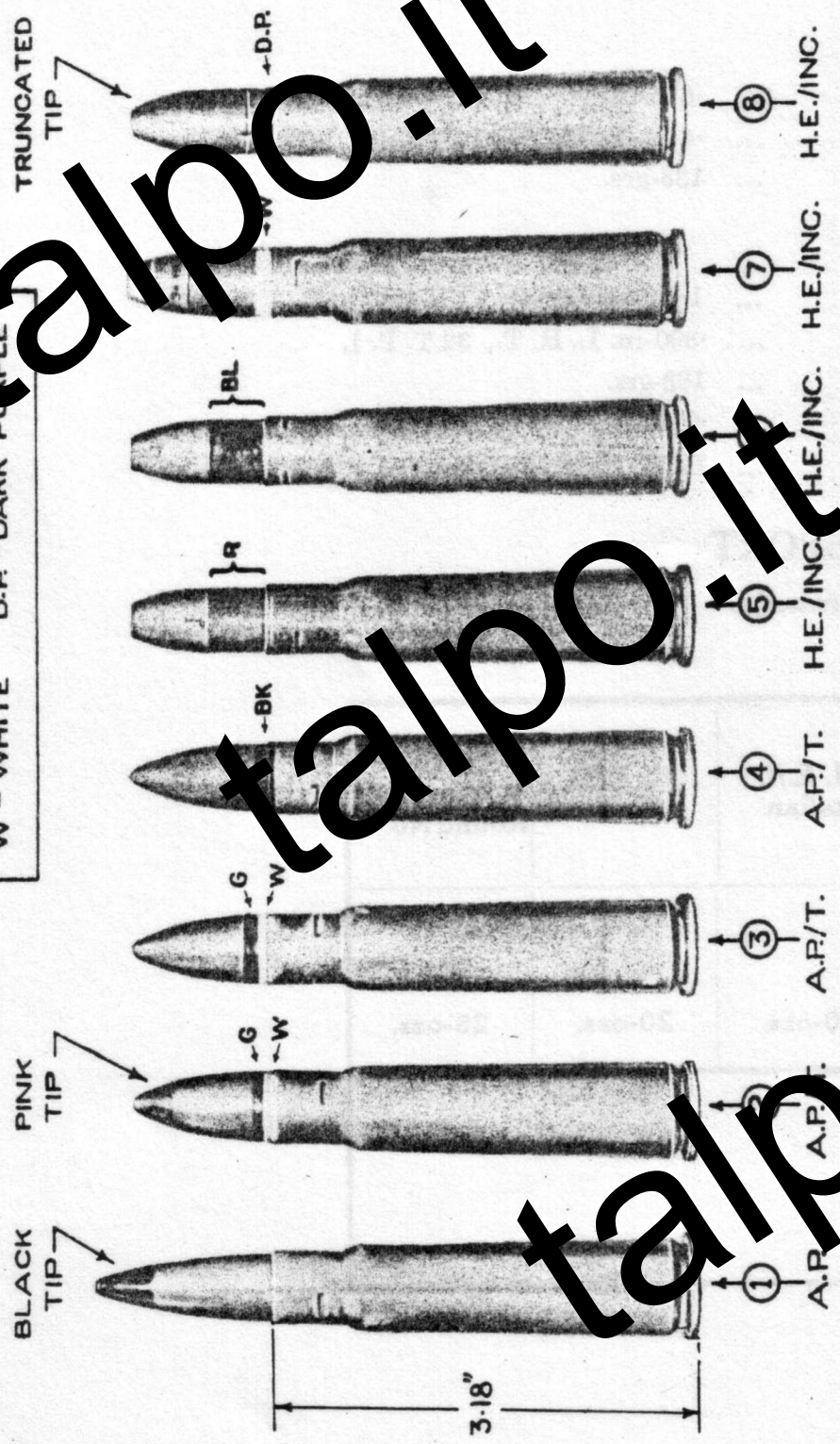
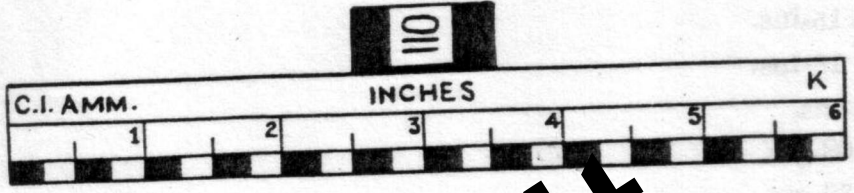
Notes.—1. Round 6 has not been examined at the range and the sketch shown has been built up from dimensions reported, and included for the sake of completeness and visual comparison.

2. The three 37-mm. rounds have been included for the same reason but are also fully dealt with in Section E under gun ammunition.

RESTRICTED.

KEY TO COLOUR BANDS

- R - RED
- G - GREEN
- W - WHITE
- BL - BLUE
- BK - BLACK
- D.P. - DARK PURPLE



JAPANESE A.C. CANNON CARTRIDGES 12.7 M.M.

SEMI-RIMLESS
FOR A.C. CANNON (BROWNING TYPE)
COMPARATIVE PHOTOGRAPH.

<p>BLACK TIP LEAD TIP GILDING METAL STEEL CORE CRIMPED INTO CANNELURE IN BULLET. 3 INDENTS. A.P. BULLET (WEIGHT 594 GRs) BRASS CASE</p> <p>Q. D. 37 39 COPPER CAP— PUSH FIT. BRASS CAP RINGED IN.</p>	<p>FUZE (BRASS) FUZE LOWER HALF L.H.T. (26 T.P.I.) CLOTH DISC. AZIDE BODY (BRASS) INC. COMPO. BARIUM NITRATE ETC. LINER (STEEL)</p>	<p>FUZE (BRASS) L.H.T. (32 T.P.I.) BODY (BRASS) GAINE (BRASS) P.E.T.N. LINER (STEEL) INC. COMPO. POT. PERCHLORATE ETC.</p>	<p>LEAD TIP BRASS ENVELOPE STEEL CORE COPPER TUBE TRACER COMPO. CLOTH DISC BRASS ASH PRIMING COMPO.</p>	<p>GRAPHITED TUBULAR N.C. & N.G WITH CARBAMITE AS STABILIZER (1 IN. X .05 IN.) GREEN BAND WHITE BAND OR BLACK BAND ONLY ACCORDING TO TRACER COMPO. USED.</p>
<p>FUZE (BRASS) FUZE LOWER HALF L.H.T. (26 T.P.I.) CLOTH DISC. AZIDE BODY (BRASS) INC. COMPO. BARIUM NITRATE ETC. LINER (STEEL)</p>	<p>FUZE (BRASS) L.H.T. (32 T.P.I.) BODY (BRASS) GAINE (BRASS) P.E.T.N. LINER (STEEL) INC. COMPO. POT. PERCHLORATE ETC.</p>	<p>FUZE (BRASS) L.H.T. (32 T.P.I.) BODY (BRASS) GAINE (BRASS) P.E.T.N. LINER (STEEL) INC. COMPO. POT. PERCHLORATE ETC.</p>	<p>FUZE (BRASS) L.H.T. (32 T.P.I.) BODY (BRASS) GAINE (BRASS) P.E.T.N. LINER (STEEL) INC. COMPO. POT. PERCHLORATE ETC.</p>	<p>GRAPHITED TUBULAR N.C. & N.G WITH CARBAMITE AS STABILIZER (1 IN. X .05 IN.) GREEN BAND WHITE BAND OR BLACK BAND ONLY ACCORDING TO TRACER COMPO. USED.</p>
<p>FUZE (BRASS) L.H.T. (32 T.P.I.) BODY (BRASS) GAINE (BRASS) P.E.T.N. LINER (STEEL) INC. COMPO. POT. PERCHLORATE ETC.</p>	<p>FUZE (BRASS) L.H.T. (32 T.P.I.) BODY (BRASS) GAINE (BRASS) P.E.T.N. LINER (STEEL) INC. COMPO. POT. PERCHLORATE ETC.</p>	<p>FUZE (BRASS) L.H.T. (32 T.P.I.) BODY (BRASS) GAINE (BRASS) P.E.T.N. LINER (STEEL) INC. COMPO. POT. PERCHLORATE ETC.</p>	<p>FUZE (BRASS) L.H.T. (32 T.P.I.) BODY (BRASS) GAINE (BRASS) P.E.T.N. LINER (STEEL) INC. COMPO. POT. PERCHLORATE ETC.</p>	<p>GRAPHITED TUBULAR N.C. & N.G WITH CARBAMITE AS STABILIZER (1 IN. X .05 IN.) GREEN BAND WHITE BAND OR BLACK BAND ONLY ACCORDING TO TRACER COMPO. USED.</p>
<p>FUZE (BRASS) L.H.T. (32 T.P.I.) BODY (BRASS) GAINE (BRASS) P.E.T.N. LINER (STEEL) INC. COMPO. POT. PERCHLORATE ETC.</p>	<p>FUZE (BRASS) L.H.T. (32 T.P.I.) BODY (BRASS) GAINE (BRASS) P.E.T.N. LINER (STEEL) INC. COMPO. POT. PERCHLORATE ETC.</p>	<p>FUZE (BRASS) L.H.T. (32 T.P.I.) BODY (BRASS) GAINE (BRASS) P.E.T.N. LINER (STEEL) INC. COMPO. POT. PERCHLORATE ETC.</p>	<p>FUZE (BRASS) L.H.T. (32 T.P.I.) BODY (BRASS) GAINE (BRASS) P.E.T.N. LINER (STEEL) INC. COMPO. POT. PERCHLORATE ETC.</p>	<p>GRAPHITED TUBULAR N.C. & N.G WITH CARBAMITE AS STABILIZER (1 IN. X .05 IN.) GREEN BAND WHITE BAND OR BLACK BAND ONLY ACCORDING TO TRACER COMPO. USED.</p>
<p>FUZE (BRASS) L.H.T. (32 T.P.I.) BODY (BRASS) GAINE (BRASS) P.E.T.N. LINER (STEEL) INC. COMPO. POT. PERCHLORATE ETC.</p>	<p>FUZE (BRASS) L.H.T. (32 T.P.I.) BODY (BRASS) GAINE (BRASS) P.E.T.N. LINER (STEEL) INC. COMPO. POT. PERCHLORATE ETC.</p>	<p>FUZE (BRASS) L.H.T. (32 T.P.I.) BODY (BRASS) GAINE (BRASS) P.E.T.N. LINER (STEEL) INC. COMPO. POT. PERCHLORATE ETC.</p>	<p>FUZE (BRASS) L.H.T. (32 T.P.I.) BODY (BRASS) GAINE (BRASS) P.E.T.N. LINER (STEEL) INC. COMPO. POT. PERCHLORATE ETC.</p>	<p>GRAPHITED TUBULAR N.C. & N.G WITH CARBAMITE AS STABILIZER (1 IN. X .05 IN.) GREEN BAND WHITE BAND OR BLACK BAND ONLY ACCORDING TO TRACER COMPO. USED.</p>

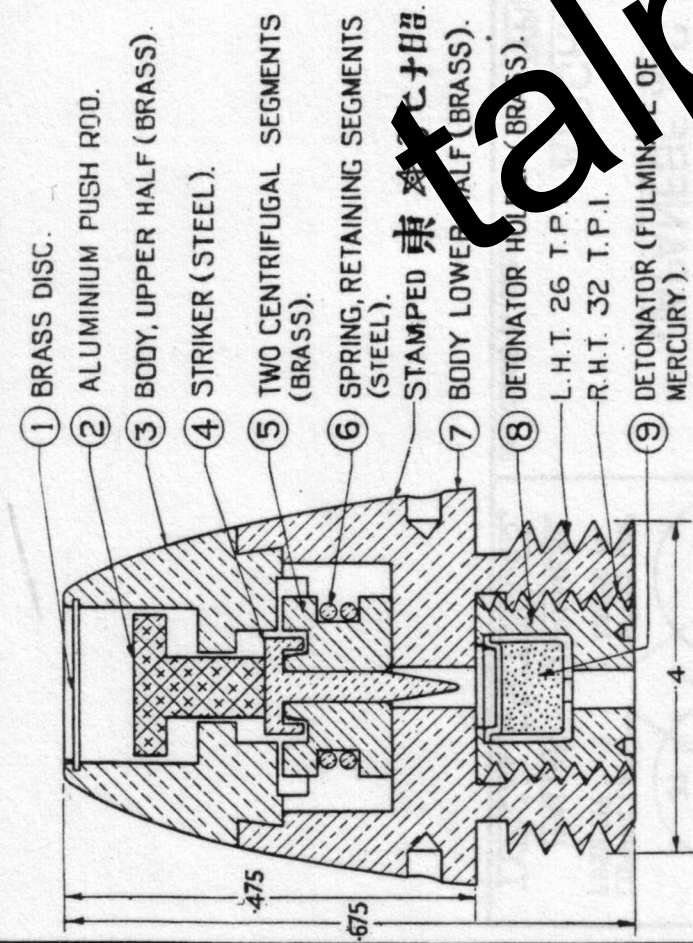
JAPANESE A.C. GANNON CARTRIDGES 12.7 MM. (SEMI-RIMLESS).

FOR AIRCRAFT GANNON (BROWNING TYPE). TYPICAL CARTRIDGE & DETAILS OF SHELL.

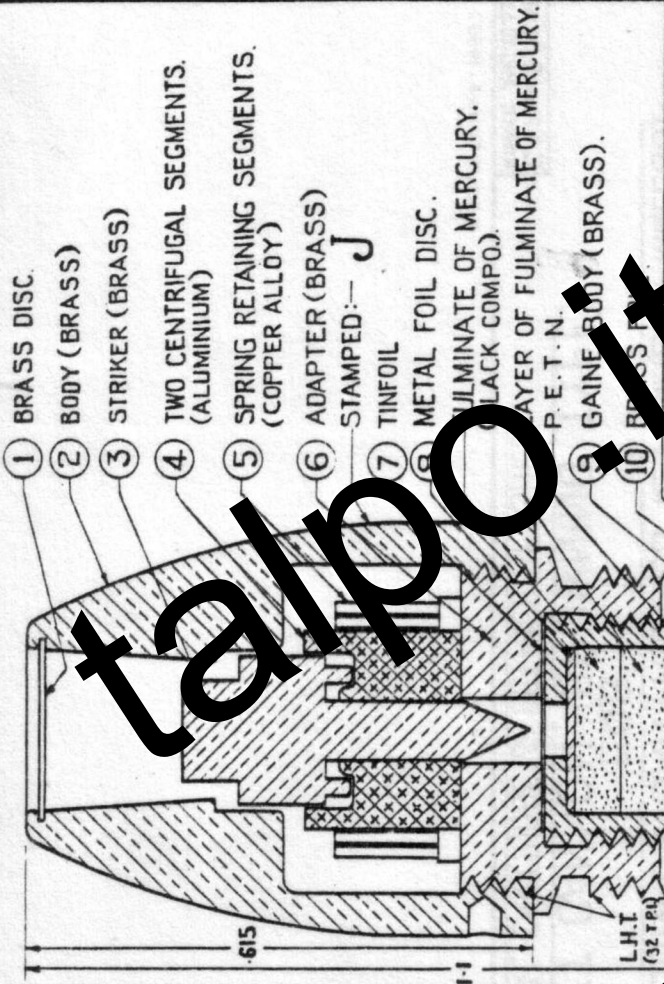
WEIGHT OF SHELL	548 GRs.	570 GRs.	533 GRs.	508 GRs.
PROPELLANT	127 GRs N.C.	127 GRs N.C. & N.G.	127 GRs N.C.	132 GRs N.C.

ITALIAN JAPANESE TYPICAL CARTRIDGES.

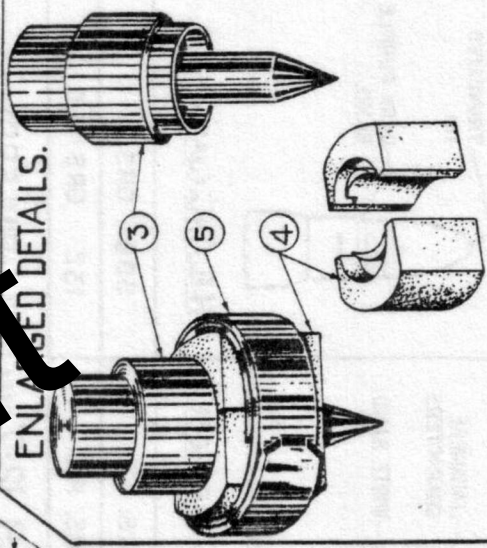
C.I. AMN. S/1205 KIRKEE. AUG. 1945



TYPE 'A' FUZE (JAPANESE).



TYPE B FUZE (ITALIAN)



FOR
 FUZES, PERCUSSION, D. A.
 JAPANESE C. CANNON CARTRIDGES 12.7 MM. (SEMI-RIMLESS).
 FOR A. C. CANNON BROWNING TYPE
 DETAILS OF TYPICAL JAPANESE & ITALIAN FUZES)

DIMENSIONS IN INCHES.

C.I. AMN. S/1206
KIRKEE, AUG. 1945
G.P.Z.F. POONA 19/45

THIS LEAFLET MUST NOT
FALL INTO ENEMY HANDS

D. OF A. (INDIA)

SECTION B

JAPANESE AMMUNITION LEAFLETS

LEAFLET B 15

CARTRIDGES, S.A., 20-MM. — GENERAL NOTES

GENERAL

There are a number of Japanese 20-mm. ammunition and it is essential to appreciate the various equipments in this calibre in order to identify the ammunition with the appropriate gun.

2. So far four different weapons in the 20 mm. calibre are known, each chambered for different types of cartridge. The largest cartridge is used for the Type '98 A. A./A. T. machine gun, the length of the case being 5.6-ins. The next largest is for the Type '97 A. T. machine gun which, when suitably modified, is reported to be used also as an aircraft cannon; the length of this cartridge case is 4.9-ins. The next cartridge in size is that for the Type Ho 5-20-mm. (Browning mechanism) fixed aircraft cannon; the size of cartridge case is 3.7 ins. The smallest cartridge is used in the Type '99 A. C. cannon and more recent weapons similarly chambered; the length of the cartridge case is 2.8-ins. This latter weapon appears to be widely used and samples of practically all types of ammunition for it were captured in Assam and Burma. This machine gun is reported to be also used in a ground role for A. A./A. T. purposes and as a heavy M. G. in an infantry support role.

American reports refer to two designs of this weapon which they call:—

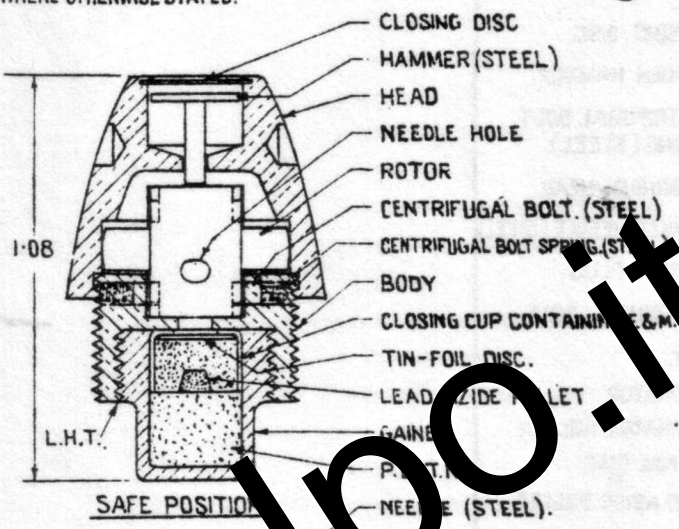
- (a) Type '99 Mk. 1 A. C. Cannon.
- (b) Type '99 Mk. 2 A. C. Cannon.

The ammunition for both these types is identical except that the cartridge case for the latter is larger (length-3.9").

The Japanese Army is also known to be using the German Mauser 151/20 A. C. Cannon which uses a cartridge case 3.18" long.

FUZE MADE OF BRASS EXCEPT WHERE OTHERWISE STATED.

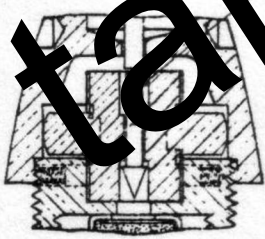
(V)



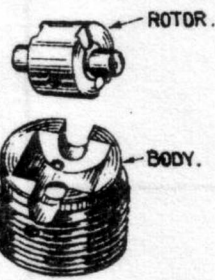
1.08

L.H.T.

SAFE POSITION



ARMED POSITION

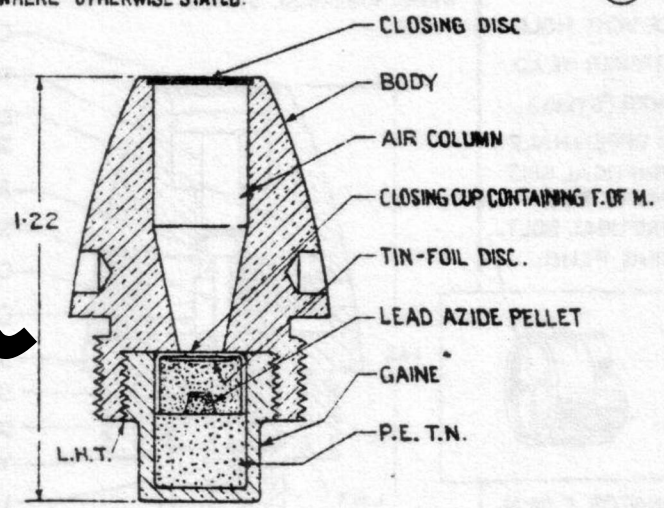


ROTOR.

BODY.

FUZE MADE OF BRASS EXCEPT WHERE OTHERWISE STATED.

(V)



1.22

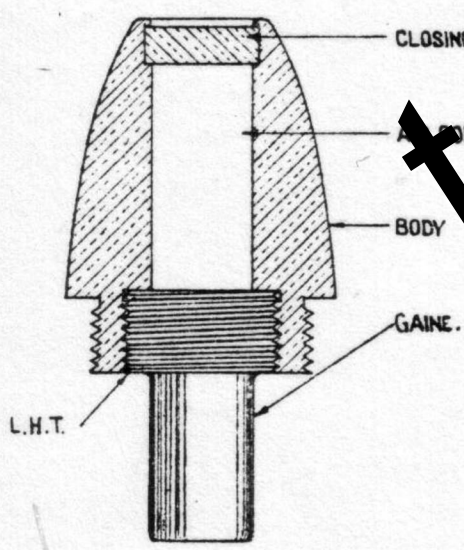
L.H.T.

FUZE, PERCUSSION, D.A. (STRIKERLESS TYPE).

(E) FUZE, PERCUSSION, D.A. (ROTOR TYPE).

(F)

FUZE MADE OF BRASS EXCEPT WHERE OTHERWISE STATED.

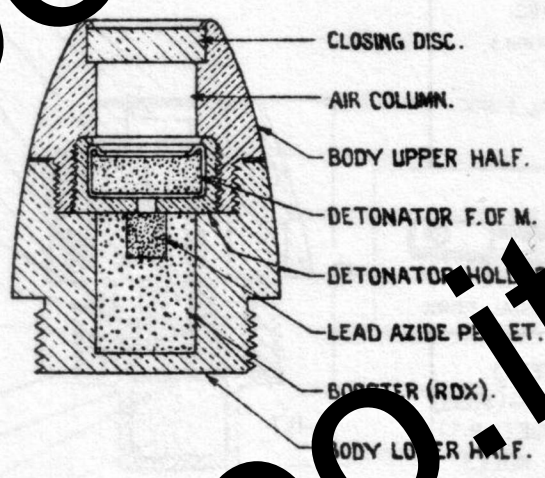


L.H.T.

FUZE, PERCUSSION, D.A. (STRIKERLESS TYPE.)

(H)

FUZE MADE OF BRASS EXCEPT WHERE OTHERWISE STATED.



FUZE, PERCUSSION, D.A. (STRIKERLESS TYPE.)

(G)

FUZES, NOSE, PERCUSSION, D. A.,

FOR
JAPANESE 20MM AMMUNITION.

THIS LEAFLET MUST NOT
FALL INTO ENEMY HANDS

D. OF A. (INDIA)

JAPANESE AMMUNITION LEAFLETS

SECTION B
LEAFLET B 16

CARTRIDGES, S.A., 20-mm.
FOR
TYPE '97 A.T. MACHINE GUN.

GENERAL

The Type '97 A.T. Machine Gun is a gas operated, air cooled, automatic weapon and is usually fired in the prone position from the shoulder. It can be carried into positions inaccessible to other anti-tank weapons.

2. Apart from A.P. and A.F./T. rounds, H.E./I. (fuzed), H.E./I. (fuzeless), H.E./T. and H.E./T. self destroying rounds also exist for this weapon but the only one examined at Kirkee is the H.E./I. No details are available of the other types and therefore they are not included in this Leaflet. Although this machine gun is reported to be a single purpose weapon (A.T.), the existence of various types of H.E. round suggests that it is also used against thin-skinned vehicles.

In this Leaflet it is proposed to discuss the H.E./I. (fuzed) round only.

DESCRIPTION

3. The Plate A gives details of the complete round whereas Plate B shows its external appearance and method of packing.

4. Cartridge Case. The case is of brass and is similar in design to that for the 20-mm. Type '98 gun, though of smaller dimensions. It is secured on to the projectile by three long crimps. The length is 4.9-in.

5. Propellant. The charge weighs 1.34 ozs. and consists of tubular grains of graphited N. C.

A sheet of lead tin foil, 2.1" x 1.7" x .002" in size is included as a decoppering agent.

6. Primer. The primer used is the type 'H' which has already been described in J.A.L. E2 (a).

7. Shell H.E./Incendiary. The shell body is machined from steel bar and is drilled from the nose to hold 92 grains of an incendiary composition above which are 49 grains of H.E. The incendiary composition consists of Barium nitrate, Aluminium, Magnesium and Wax and the H. E. of R. D. X. and Wax.

8. Fuze. The fuze used is the Type '93 small (type 'A') described in J.A.L. B15.

PACKING

9. The rounds examined at Kirkee, were received packed, each round in a cardboard container, a photograph of which is included at Plate B

IDENTIFICATION

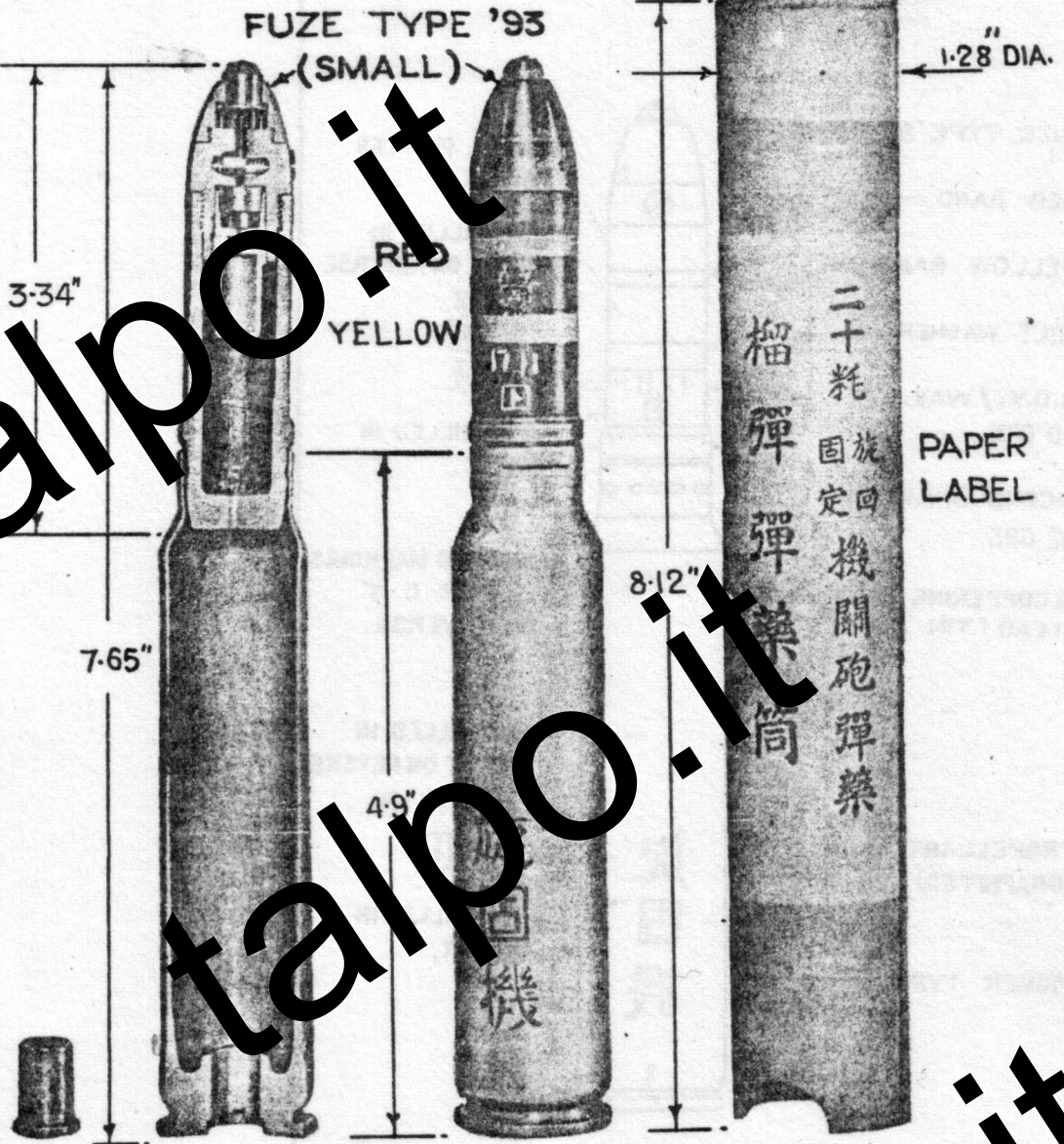
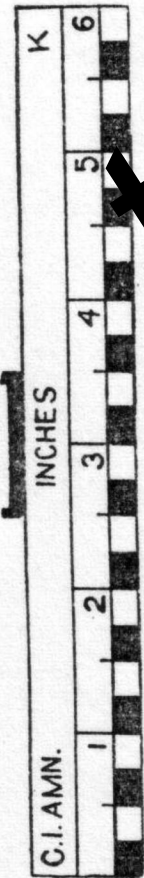
10. This shell is painted black with a yellow band around the middle of the body and a red band immediately below the shoulder. Note the length of the cartridge case which is 4.9 inches. A label in Japanese characters attached to the cardboard container indicates the calibre and type of ammunition.

HANDLING AND TRANSPORT

(Of captured ammunition by Ordnance)

11. See J.A.L. B1 and B15.

EXPLOSION/FIRE RISK	..	3.6 oz. (for 12 rds.)
GROUP CLASSIFICATION	..	VI, Category Z.
CLASSIFICATION FOR SEA TRANSPORT	..	O. A. S. (c)

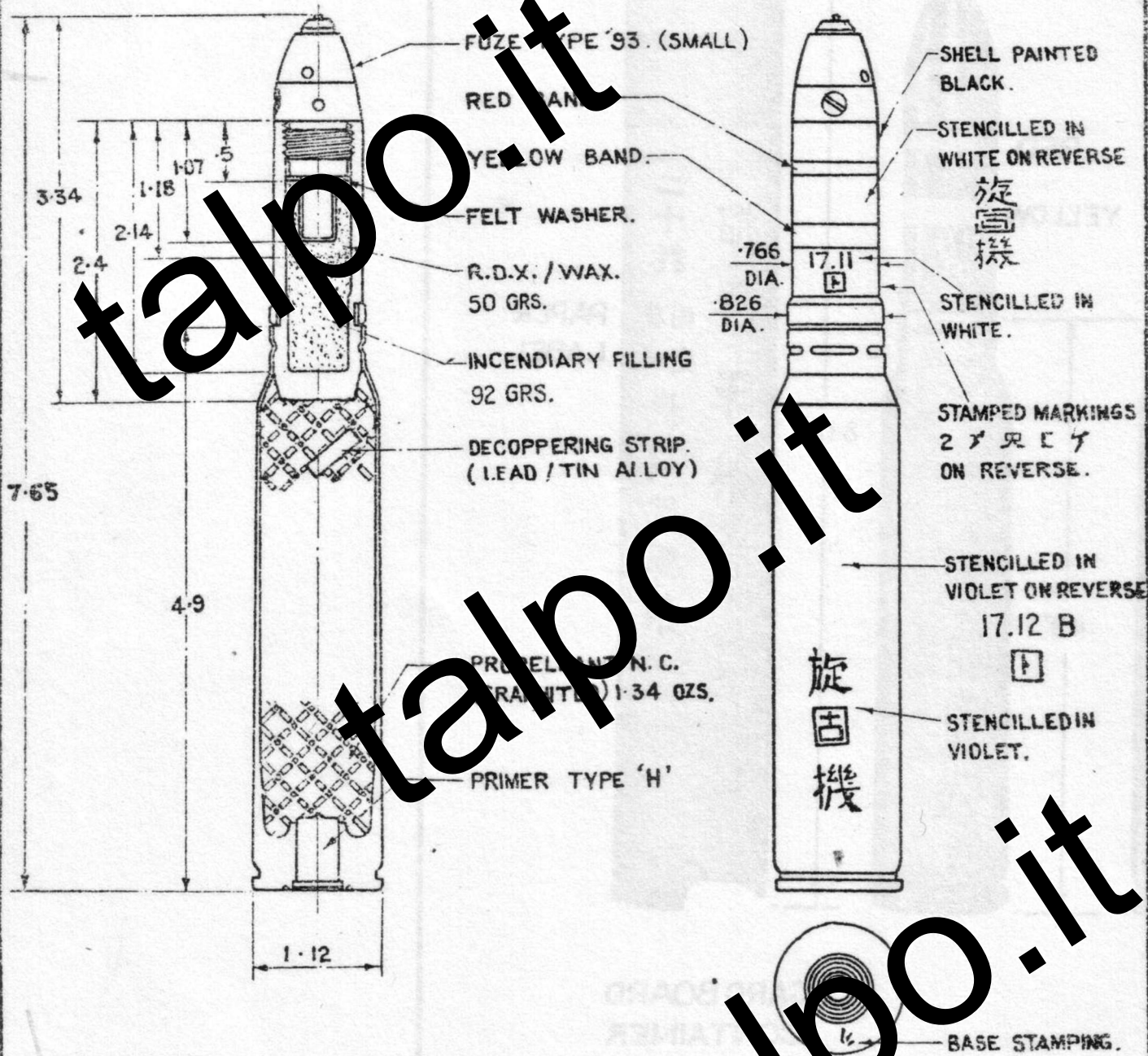


PRIMER
TYPE 'H'

CARD BOARD
CONTAINER

JAPANESE
 CARTRIDGE 5 A 20 MM. H.E./I.
 FOR
 TYPE '97 A./T. MACHINE GUN.

C.I. AMN. S/1480
KIRKEE JUNE 46



COMPLETE WT. 10.2 OZS.

DIMENSIONS IN INCHES.

JAPANESE
CARTRIDGE S.A. 20MM. H.E./I
FOR
TYPE '97 A/T MACHINE GUN.

C.I.A.M.N. 5/1476.
KIRKEE, JUNE 46

THIS LEAFLET MUST NOT
FALL INTO ENEMY HANDS

D. OF A. (INDIA)

JAPANESE AMMUNITION LEAFLETS

SECTION B

LEAFLET B 17

CARTRIDGES, S.A., 20-MM.,

FOR

JAPANESE TYPE '98 A.A./A.T. GUN

GENERAL

The Type '98 A.A./A.T. gun is an all purpose, gas operated, air-cooled, automatic weapon which is usually fired on a tripod but which is also mounted on wooden wheels for mobility. It has proved effective against low flying aircraft but may also be used as an A.T. weapon or as a heavy machine gun.

2. This weapon uses the largest cartridge head of all the 20-mm. types and consequently a large propellant charge can be loaded and a high muzzle velocity obtained. It is reported that the muzzle velocity is 2720 ft./sec. and that this gives a maximum ground range of 5450 yds. and a ceiling of 12,000 feet.

3. So far, five types of projectile are known to be used in the equipment and these are shown together with a typical complete round in the drawing at the end of this Leaflet; three of these projectiles have actually been examined here and these are indicated on the drawing by a "V". A chart summarising all the data for these rounds is also included at the end of this Leaflet.

DESCRIPTION

4. Cartridge Case. This is a solid drawn brass case of the S.A.A. type recessed at the base to take a push-in type 'H' primer described in J.A.L. B. 2 (a). A lip formed in the cartridge head is turned over to secure the primer, already a very tight fit, in position. The case is heavily necked and is crimped into a cannelure and this secures the projectile to the case.

5. Propellant. The cartridge case is loosely filled with graphited tubular grains of propellant which consist of N.C. stabilized with diphenylamine and D.N.T. A sheet of lead/tin foil is included as a decoppering agent.

PROJECTILES

6. H.E./Tracer. The shell body is machined from steel bar and the method of filling follows normal practice for such rounds. A type 'A' fuze (See J.A.L. B. 15) screws into the nose. The base is closed with a screwed plug which has a central hole to allow the propellant gases to ignite the tracing composition.

7. H.E./T. Self-Destroying. The method of construction of this shell is generally similar to that of the H.E./T. shell but the central portion is drilled to take the self-destroying element; this consists of a brass tube filled with mealed G.P. which connects the two compartments. The shell is fuzed with a fuze Type "B" (See J A.L. B. 15). The shell actually examined here had a main filling of gunpowder and bore a marking in Japanese characters meaning "Practice". These shell then are obviously used for practice purposes but it is probable that they are merely a modification of a service design normally filled with H. E., especially as a fuze with a detonating gaine was fitted to the specimen examined. This means that shell, identical in external appearance with the practice round except in the stencilling, may be encountered with an H. filling.

8. H.E./I. This is made in two pieces; the head, containing the H.E. filling, screws into the body which contains the incendiary composition. There is no fuze, the H.E. filling being sufficiently sensitive to detonation on impact.

9. A.P./T. This is a standard steel bullet recessed at the base to take the tracing and priming compositions and closed with a screwed plug.

10. Practice This is a wooden bullet fitted with a driving band, and is used as bulleted blank.

PACKING

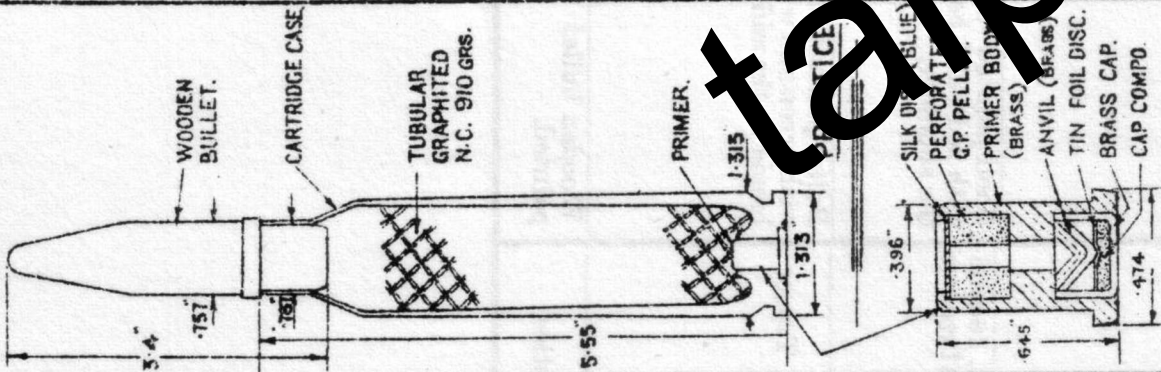
11. No details of bulk packing are known, but the rounds received in Kirkee was packed in a cylindrical cardboard carton, closed at one end and having a hollow wooden cylinder inside the closed end to receive the shell. Two labels were pasted on the carton giving the type of round, gun in which fired and the date and place of manufacture.

HANDLING AND TRANSPORT

(Of captured armaments by Ordnance)

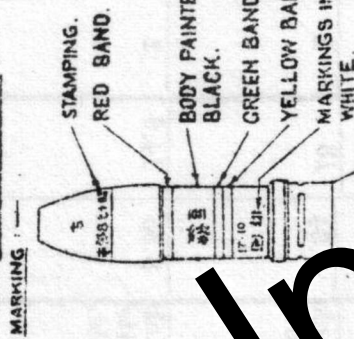
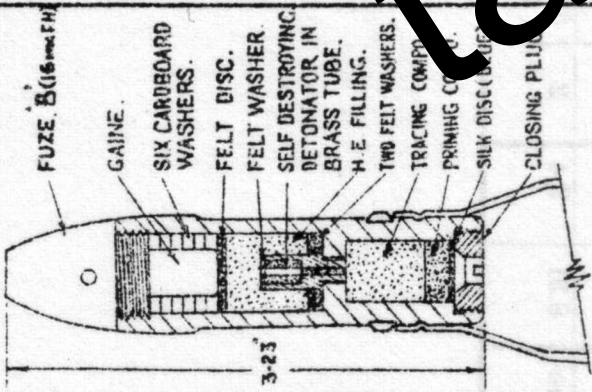
12. See J.A.Ls. B. 1 and E. 15

	H.E./T.	H.E./T/SD	H.E./I	A P./T	Practice
EXPLOSION/FIRE RISK	1½ oz.	1½ oz.	1½ oz.	1-oz.	1-oz.
GROUP CLASSIFICATION	VI, Z	VI, Z	VI, Z	VI, Z	VI, X
CLASSIFICATION FOR SEA TRANSPORT	Q. A. S. C)				



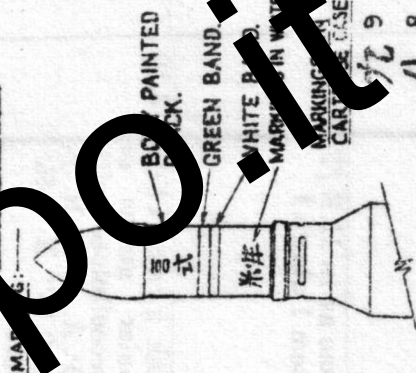
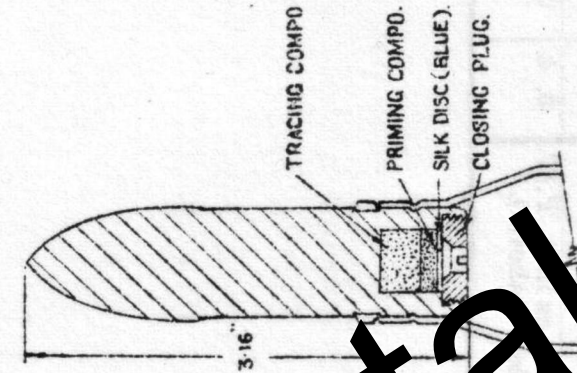
COMPLETE ROUND (TYPICAL)

(V)



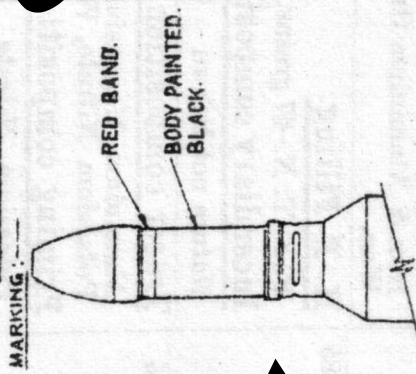
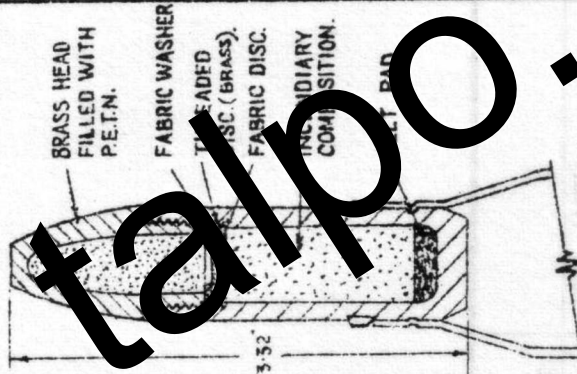
(V) E.T. SELF DESTROYING.

NOTES:
1) ALL THREADS ARE R.H.P. EXCEPT WHERE OTHERWISE STATED.
2) ALL SHELLS COMPLETELY MADE OF STEEL UNLESS CARTRIDGE CASE MADE OF BRASS EXCEPT WHERE OTHERWISE STATED.



(V) A.P. TRACER.

NOTES:
1) ALL THREADS ARE R.H.P. EXCEPT WHERE OTHERWISE STATED.
2) ALL SHELLS COMPLETELY MADE OF STEEL UNLESS CARTRIDGE CASE MADE OF BRASS EXCEPT WHERE OTHERWISE STATED.



(V) H.E. TRACER.

NOTES:
1) ALL THREADS ARE R.H.P. EXCEPT WHERE OTHERWISE STATED.
2) ALL SHELLS COMPLETELY MADE OF STEEL UNLESS CARTRIDGE CASE MADE OF BRASS EXCEPT WHERE OTHERWISE STATED.

JAPANESE 20MM. RIMLESS AMMUNITION.

TYPE '98 A.A. A.T. MACHINE GUN.
TYPICAL CARTRIDGE & DETAILS OF SHELL FILLING.

(V)

RESTRICTED.

CARTRIDGES S. A. 20-MM. TYPE '98 A. A./A T. MACHINE GUN.

Serial No.	Type of Cartridge	Markings.	Complete Round		Propellant		Length (Ins.)	Weight (ozs.)	Shell (Fuze)/Bullet, Filling.	Fuze.
			Length (Ins.)	Weight (ozs.)	Weight (ozs.)	Nature,				
1	H.E. Tracer	Shell body painted black with red band on shoulder, yellow band below shoulder and white band above driving band.	8.5	14	2	Cylindrical grains of graphited Nitro-cellulose with D.N. T. and D.P.A. size, 0.11" length 0.058" diameter.	3.2	4.3	<u>H. E. Filling</u> Barium Peroxide, Magnesium Nitrate, Magnesium Peroxide, Magnesium and wax. } 34 grs. <u>Tracer Composition</u> <u>Priming Composition</u> Barium peroxide, Magnesium and wax.	"A" 16-mm. F. H. believed Type '93 (small).
2	H.E. Tracer self-destroying.	Shell body painted black with red band on shoulder, green and white bands in the middle.	8.2	14.8	2	Believed to be the same as in A. P. T. (Item 4 below).	3.23	4.7	<u>H. E. filling.</u> G. P. See Para 7, Page 2 <u>Self-destroying element</u> Mealed gunpowder <u>Tracer composition.</u> Same as Serial 1. <u>Priming composition.</u> Magnesium, Barium Peroxide, Iron & Aluminium (traces), Wax. } 37 grs. } 74 grs.	"B" 16-mm. F. H. believed Type '100 (small)
3	H.E. Incendiary (fuzeless)	Shell painted black with red band below the shoulder.	8.34	13	2	Same as in H.E./T. (Item 1 above)	3.32	3.85	<u>H. E. Filling.</u> P. E. T. N.-67 grains. <u>Incendiary composition</u> Nature not known ... 136 grs.	...
4	A.P. Tracer	Bullet painted black with green and white bands in the middle	8.35	14.6	2	Black graphited tubular grains of Nitrocellulose with D.P.A. & D. N. T. size 0.14" X 0.65" X 0.01".	3.16	5.5	<u>Tracer composition.</u> Aluminium, Magnesium and Potassium Nitrate, Wax. <u>Priming composition.</u> Potassium Nitrate, Barium peroxide Magnesium powder, and Wax. } 33 grs.	...
5	Practice	Wooden bullet unpainted.	8.3	9.4	2	Same as in A. P./T. (Item 4 above).	3.4	0.2

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SECTION B

JAPANESE AMMUNITION LEAFLETS

LEAFLET B 18

CARTRIDGES S. A., 20-MM.

FOR

TYPE '99 AIRCRAFT CANNON

GENERAL

Of all the types of 20-mm. equipment, the Type '99 A.C. Cannons were the most extensively used in the Burma campaign and large quantities of ammunition were captured. The 20-mm. aircraft cannon is reported to be used in the majority of Japanese planes, both as fixed guns in fighter planes and as flexible guns in bombing planes.

2. Four versions of this cannon are known to exist namely:—

- (i) Fixed A.C. Cannon Mk. I.
- (ii) Fixed A.C. Cannon Mk. II.
- (iii) Flexible A.C. Cannon Mk. I and
- (iv) Flexible A.C. Cannon Mk. II.

These cannons have often been converted to ground weapons and used in defensive positions. In some instances they have been found on well constructed mounts with A.A. or A.T. sights attached; in others they were on poorly constructed, hastily improvised tripods and were not equipped with sights.

3. The following data, taken from reports, will be useful:—

	Fixed A.C. Cannon Mk. I	Flexible A.C. Cannon Mk. I	Fixed A.C. Cannon Mk. II	Flexible A.C. Cannon Mk. II
Length of barrel	32 $\frac{1}{2}$ -ins.	30-ins.	30-ins.	30-ins.
Muzzle Velocity	1960 f. s.	1930 f. s.	2437 f. s.	2800 f. s.
Effective Range	550 yds.	—	600-700-yds.	300-yds.
Operation	Gas	Blow-back	Gas	Gas
Rifling	9 grooves	9 grooves	9 grooves	9 grooves

4. It should be noted that the ammunition for the different marks of these cannons is not interchangeable as the size of the cartridge cases differs; the cartridge case for Mk. I cannons is 2.8-in. long as against 3.9-in. for the one used in Mk. II. So far as is known the projectiles can be fired from any of these weapons.

5. A chart giving the summarised details of all the known types of ammunition is included in this Leaflet; those items marked with a 'V' have been critically examined at Kirkee and the details given are correct; details of other types, which are taken from reports are given for the sake of completeness.

DESCRIPTION

6. The drawings at Plates A and B show the general appearance and details of construction of all the known types. Only typical rounds have been included in the Plates, and except for the colour markings and slight differences in internal dimensions etc., they are representative of the particular type.

CARTRIDGE

7. A drawing of a typical cartridge case is shown in Plate A. The case is made of brass with a rimless base, the anvil being formed integral with the case. It has a very short neck and is secured on to the projectile by three long or six short crimps.

Dimensions are given in Plate A. The internal walls are finished with brass coloured lacquer or varnish.

As stated above, another type of cartridge case (Mk. II) is known to be used, which is similar in construction but of larger dimensions. The length of case is 3.9-in. No sample of this type of case has been received at Kirkee.

8. Percussion cap—The cap is of brass, of the Berdan type, and is pressed into the case. The caps of the rounds examined here were found to hold a charge varying from 1.3 grs. to 1.9 grs. of a composition similar to British 'A' mixture e. g. mercury fulminate, potassium chlorate and antimony sulphide.

9. Propellant—The propellant is loose in the case and consists of N.C. powder. Full details are given in the chart at the end of this Leaflet.

No decoppering foil was found in the rounds examined here.

PROJECTILES

10. H. E. (dark brown body)—The shell body is machined from a steel bar and is drilled out from the nose to hold the H.E. filling. The inside walls are well finished with black lacquer or varnish. Below the driving band is a annure for the attachment of the cartridge case. The filling consists of about 160 grs. of Pentolite (40:60) having a recess in the top for the fuze gaine.

11. H.E. Tracer (red body with 1 white band)—The shell body follows the usual H.E./T construction. Dimensions are shown in Plate A. At the base of the tracer cavity is a push-fit steel sleeve holding a priming composition and closed by a thin brass disc secured in place by the wall of the sleeve being spun over.

Details of fillings are given in the chart.

12. H. E. Tracer Self-Destroying (Red body with 3 white bands)—The construction of this shell is identical to that of H.E. tracer shell (Para 11 above) with the difference that it holds a self destroying element, which consists of a black charge (presumably gunpowder) housed in the central partition and connected by black powder pellets to the H. E. filling.

It is important to note that the gaine of the fuze (Type 'D') used in this shell, is reported to hold black powder charge pellets in the gaine filling (P.E.T.N.) also.

13. H.E. Incendiary (greenish yellow with 2 white bands)—The shell is very similar to the H.E. shell (Para 10) except for the internal cavity which tapers towards the base.

It holds an H.E. filling (T.N.T.) in the lower portion above which is an aluminium capsule containing white phosphorus. Above and surrounding this capsule is a pyrotechnic mixture consisting chiefly of H.C. powder; for details see chart.

14. Armour Piercing (black body)—This is a normal A.P. bullet and can be distinguished by its black colour and solid steel body with a pointed nose. None of these have been examined at Kirkee.

15. Armour Piercing Incendiary (white body)—This has a soft copper nose cap 0.016-in. thick, extending 7/16-in. from the tip of the bullet. The incendiary cavity is drilled from the base and is threaded internally to take the steel closing plug.

The filling is reported to be a green and silver coloured powder; full details are not available.

16. Bag Burster Tracer (red body)—This round is reported (being the last one loaded into the magazine) to be the first round fired from the cannon to break the tape cap over the muzzle. The bullet can be distinguished by its red colour and blunt nose. The tracer cavity which is drilled from the base is closed by a thin brass disc, secured to the base of the bullet by being run over. Details of the tracer composition are not known.

17. Training Round (black body)—According to information available, the bullet is of the same weight and shape as the fuzed rounds. It has the appearance of typical training ammunition where weight and shape of the projectile is important and it is desired to eliminate explosive damage to the target.

FUZES

18. The fuzes used with the various rounds are shown in the fuze column in the charts at the end of this Leaflet and have been already described in J.A.L. B 15.

IDENTIFICATION

19. See Plate A, J.A.L. B 15. These cartridges can be identified from other types of 20-mm. ammunition by the length of the cartridge case which is almost equal to that of the fuzed shell. Note the elaborate system of colour bands, and the many varieties of shell in existence.

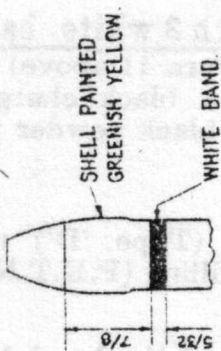
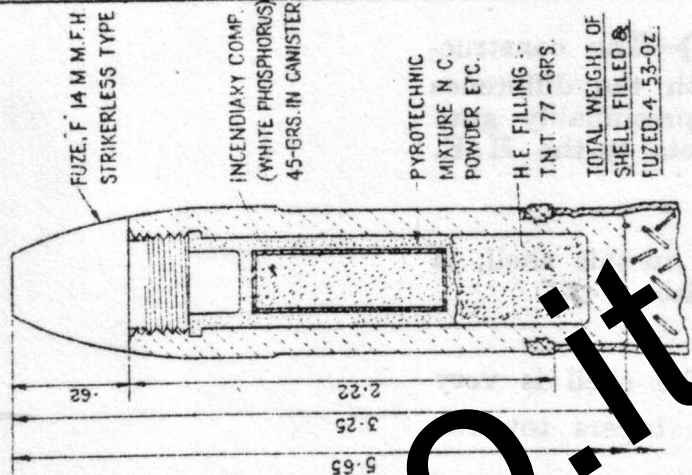
The ammunition used in the Mk. II cannons is known to have a longer cartridge case but up to date no samples have been received here.

HANDLING AND TRANSPORT

(Of captured ammunition by Ordnance)

20. See J.A.L. B1 Para. 20.

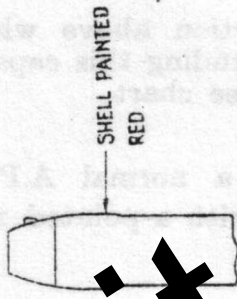
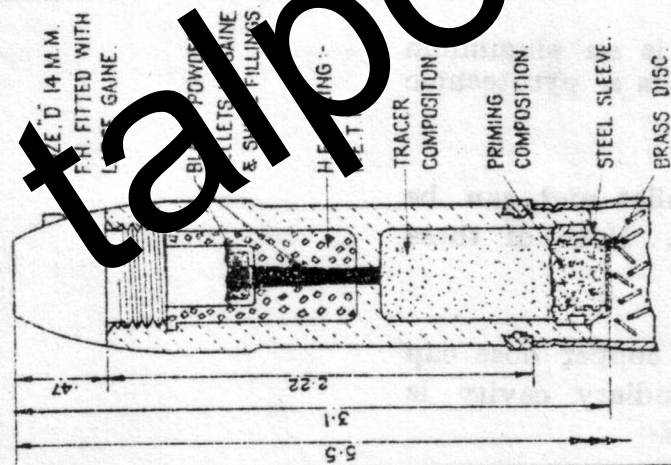
	H.E.	H.E./T.	H.E./T. S.D.	H.E./I.	A.P.	A.P./I	B.B.T.	Training
EXPLOSION/FIRE RISK. (Per 100 Rds.)	3-lbs.	4-lbs.	3½-lbs.	3¼-lbs.	1½-lbs.	2½-lbs.	2¼-lbs.	1½-lbs.
GROUP CLASSIFICA- TION.	VI, Y	VI, Z	VI, Z	XII, Y	VI, Y	XII, Y	VI, Z	VI, Y
CLASSIFICATION FOR SEA TRANS- PORT.	O. A. S. (c)							



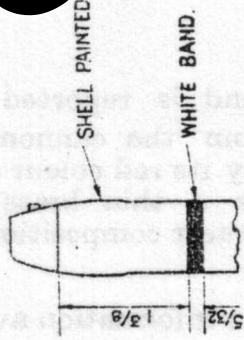
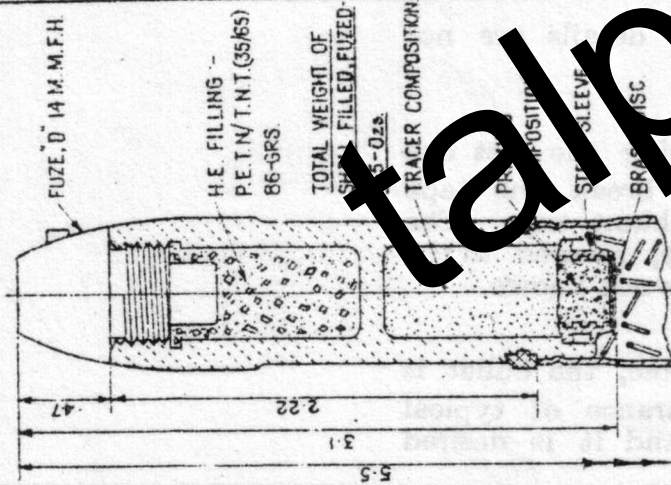
H.E. INCENDIARY

(V)

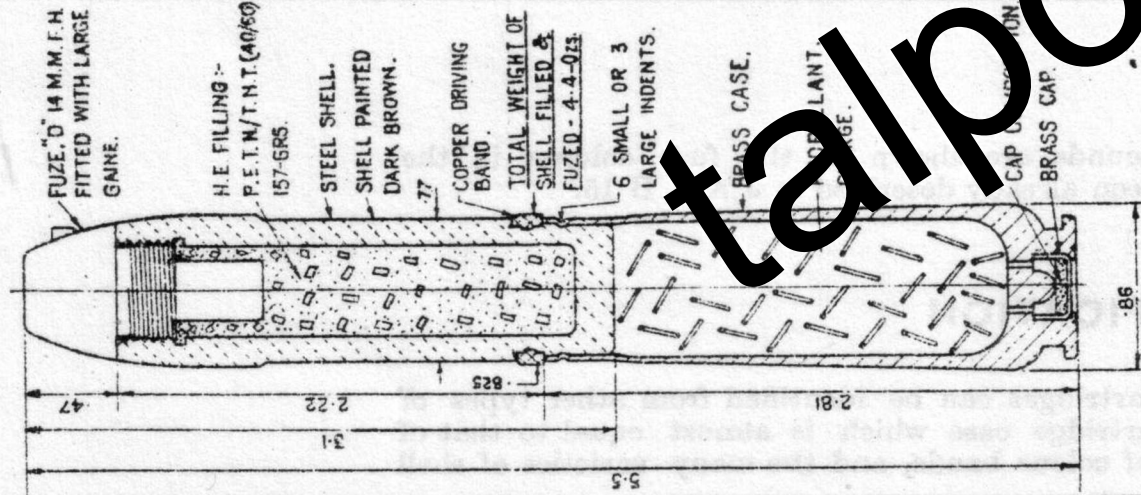
DIMENSIONS IN INCHES.



H.E. TRACER SELF DESTROYING



H.E. TRACER



H.E. ROUND WITH TYPICAL CASE

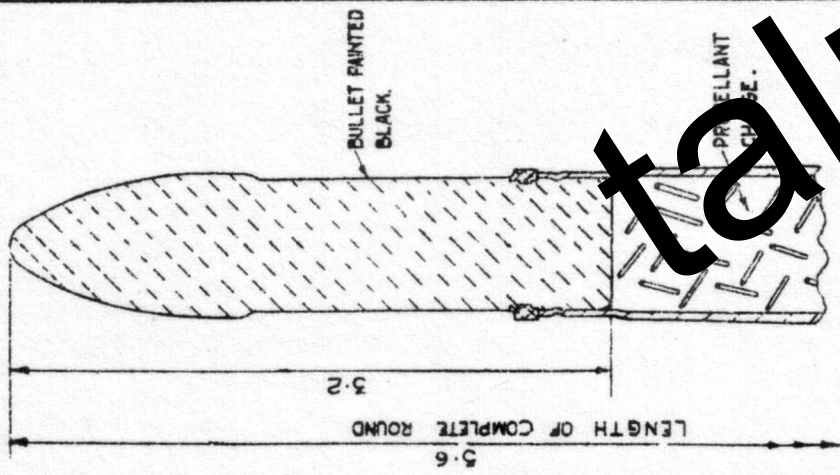
(V)

JAPANESE 20-M.M. RIMLESS AMMUNITION

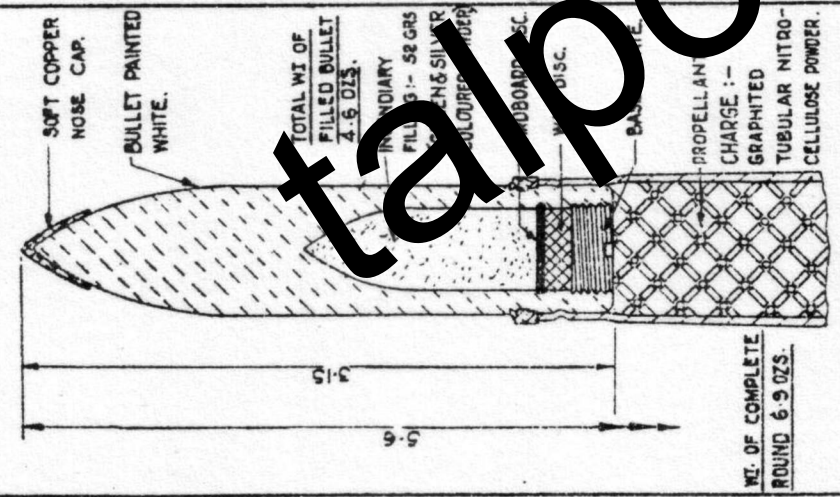
FOR

TYPE '99 AIRCRAFT CANNON.

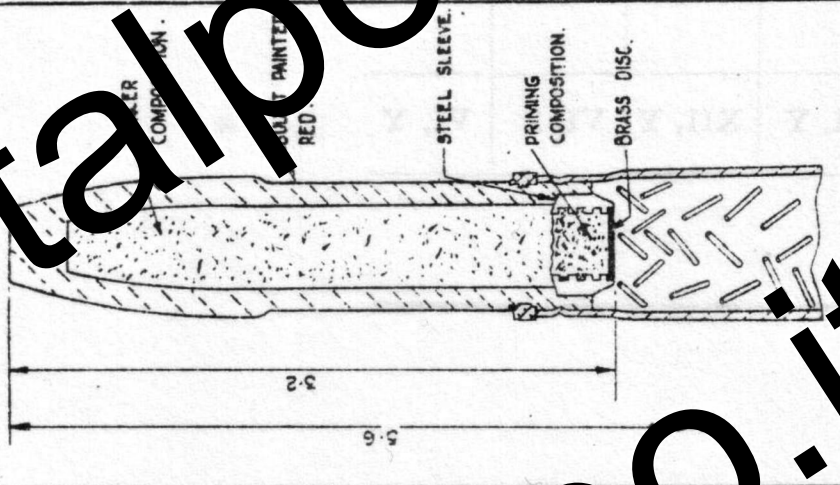
TYPICAL CARTRIDGE & DETAILS OF SHELL



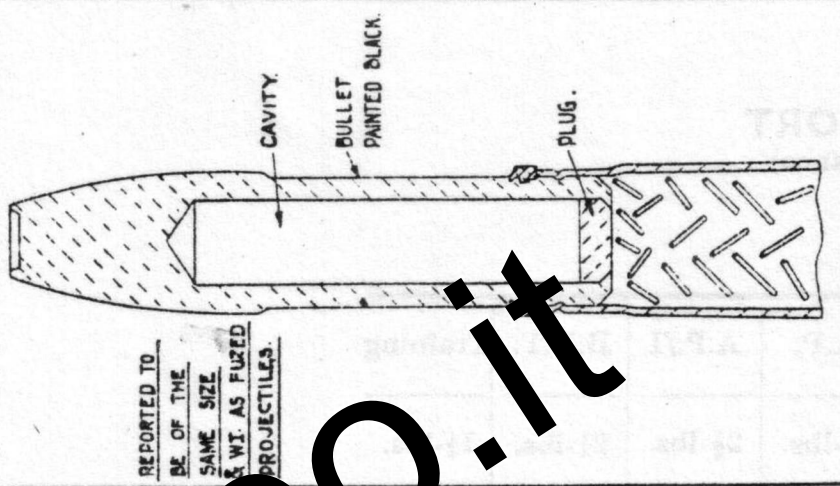
A.P.



A.P. INCENDIARY.



HIGH BURSTING TRACER.



TRAINING.

JAPANESE 20 M.M. RIMLESS AMMUNITION
FOR
TYPE '99 AIRCRAFT CANNON.
DETAILS OF SHELL.

DIMENSIONS IN INCHES

C-1-AMN 5/14-04
KIRKEE, FEB. 46
D.P.I.F. PONA. 1946.

Serial No.	Type of Cartridge	Markings	Complete Round		Propellant		Shell (Fuzed)/Bullet		Fuze	
			Length (Ins.)	Weight (Ozs.)	Weight (Ozs.)	Nature	Length (Ins.)	Weight filled (Ozs.)		Filling
1	High Explosive	a) Shell painted dark brown.	5.5	6.8	..	..	3.25	4.4	"D" 14-mm F.H., fitted with large gaine	
		b) Shell painted orange yellow	5.5	6.8	..	..	3.25	H. E. Filling. P.E.T.N./T.N.T. (40/60) — 157 grs.		
	High Explosive Tracer	V a) Shell painted red with one white band.	5.5	6.8	..	..	3.1	4.5	Same as in (a) above "D" 14-mm. F.H.	
							<u>H. E. Filling.</u> <u>P.E.T.N./T.N.T.</u> <u>(27/65) 86 grs.</u>			
							<u>Tracer Composition.</u> Strontium Peroxide, Magnesium, Aluminium & Iron oxides.			
							<u>Priming Composition.</u> Strontium Peroxide, Barium Peroxide, Magnesium, Aluminium & Iron.			

Serial No.	Type of Cartridge	Markings	Complete Round		Propellant		Shell (Fuzed)/Bullet		Fuze
			Length (Ins.)	Weight (Ozs.)	Weight (Ozs.)	Nature	Length (Ins.)	Weight filled (Ozs.)		Filling
	High Explosive Tracer	b) Shell painted red with two white bands	5.65	6.9	0.47	Graphited chopped tubular nitrocellulose powder	3.26	4.1	"C" 14-mm. F.H.
		c) Shell painted red with three white bands	5.65	6.8	0.46	Graphited chopped tubular nitrocellulose powder	3.25	4.4	"E" 14-mm. F.H., Rotor type.

H. E. Filling.
P.E.T.N./T.N.T.
(50/50) — 92 grs.

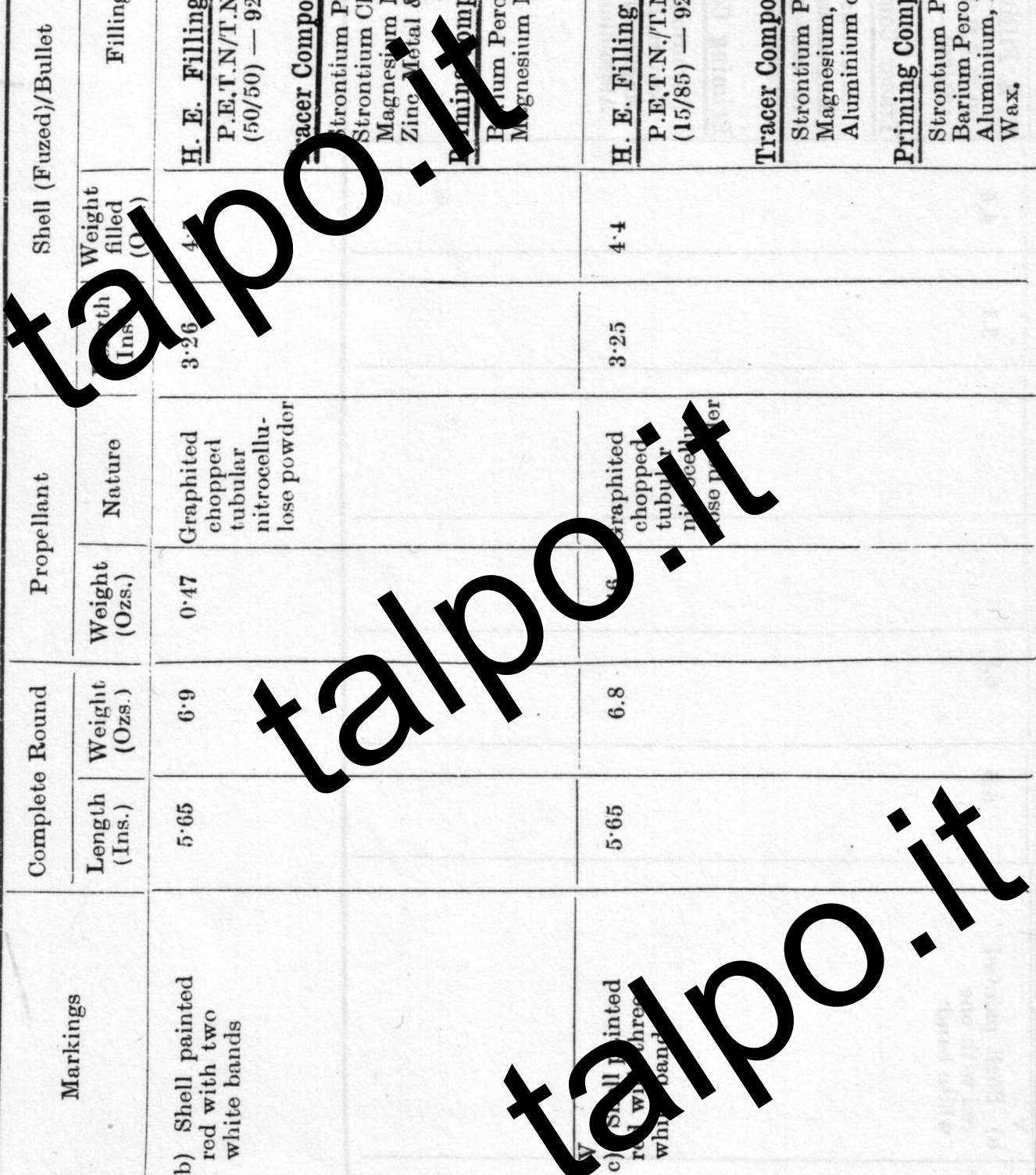
Tracer Composition.
Strontium Peroxide,
Strontium Chloride,
Magnesium Metal,
Zinc Metal & Wax.

Priming Composition
Barium Peroxide,
Magnesium Metal.

H. E. Filling
P.E.T.N./T.N.T.
(15/85) — 92.6 grs.

Tracer Composition.
Strontium Peroxide,
Magnesium, Iron &
Aluminium oxides,

Priming Composition
Strontium Peroxide,
Barium Peroxide
Aluminium, Iron,
Wax.



Serial No	Type of Cartridge	Markings	Complete Round.		Propellant.		Shell (Fuzed)/Bullet		Fuze
			Length (Ins.)	Weight (ozs.)	Weight (ozs.)	Nature	Length (Ins.)	Weight filled (ozs.)		Filling
3	H.E. Tracer, self-destroying.	Shell painted red.	5.5	—	—	—	3.1	<u>H. E. Filling.</u> <u>F. E. T. N.</u> <u>Tracer Composition</u> Barium carbonate, Magnesium, Strontium Chlorate, Iron, Manganese.	“D” 14-mm. F. H. The gaine fitted in this fuze is reported to hold black powder pellets in the gaine filling.
4	H.E. Incendiary.	(a) Shell painted yellow. (b) Shell painted greenish yellow.	5.5	—	—	—	3.25	<u>H. E. Filling.</u> <u>T. N. T. - 37 grs.</u> <u>Incendiary Composition</u> White phosphorus. Below H.E. Filling are 7 lead shots.	“D” 14-mm. F. H.
		(c) Shell painted greenish yellow with one white band.	5.5	—	—	—	3.25	<u>H. E. Filling</u> <u>T. N. T. - 77 grs.</u> <u>Incendiary Composition</u> White Phosphorus - 45 grs. <u>Pyrotechnic mixture</u> N. C., Sodium nitrate, Iron, Magnesium and Zinc.	“D” 14-mm. F. H.
			5.65	6.9	—	—	4.5	Fillings reported to be similar to ‘b’ above.	“F” 14-mm. F. H. Strikerless type.

Serial No.	Type of Cartridge	Markings	Complete Round		Propellant		Shell (Fuzed)/Bullet		Fuze	
			Length (Ins.)	Weight (ozs.)	Weight (ozs.)	Nature	Length (Ins.)	Weight filled (ozs.)		Filling
V	(d) Shell painted greenish yellow with two white bands.		5.65	6.9	.47	Graphited tubular powder, 0.1" x 0.03" x 0.01" N.C. D.P.A., D.N.T.	3.25	4.4	H. E. Filling. T.N.T. (m.p. 80°C) - 52 grains. <u>Inciendiary Composition</u> White phosphorus. <u>Pyrotechnic mixture</u> Iron, Aluminium, Graphite and Propellant N.C. Powder with D.P.A.	"F" 14-mm. F. H., Strikerless type
V	(e) Shell painted greenish yellow with two white bands.		5.65	6.9	.47	Same as in "d" above.	3.25	4.4	H. E. Filling. T.N.T. (m.p. 81°C) - 55 grains. <u>Inciendiary Composition</u> Same as 'd' above. <u>Pyrotechnic mixture</u> Same as 'd' above. - 15 grains.	"E" 14-mm. F.H., Rotor type.
5	Armour Piercing.	Bullet painted black.	5.6	—	—	—	3.2	—	—	—
6	Armour Piercing Incendiary	Bullet painted black (A soft copper cap fitted on the nose).	5.6	6.9	—	Same as in 2 (b)	3.15	4.6	<u>Inciendiary filling</u> Green & silver coloured powder: details not available. } 52 grains;	—
7	Bag Burster Tracer.	Bullet painted red (a blunt nose).	5.6	—	—	—	3.2	—	Filling details not known.	—
8	Training round.	Bullet painted black	—	—	—	—	—	—	Reported to be of the same weight and shape as of fuzed projectiles.	—

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D. OF A. (INDIA)

JAPANESE AMMUNITION LEAFLETS

SECTION B
LEAFLET B 19

CARTRIDGES, S.A., 20-mm.,
FOR
H 5 A/C. CANNON.

GENERAL

The H 5 A/C Cannon is a scaled up version of the ordinary Japanese 12.7-mm. A./C. Cannon and in design and construction represents an immense improvement over the previous 20-mm. A. M. Gs. It is recoil-operated, belt-fed, air-cooled machine gun and it is mounted either in the wing or in a power operated turret. It is fired electrically by remote control and works on the Browning principle.

2. The cyclic rate of fire of this gun is as high as 950 r. p. m. Muzzle velocities of 2300 f. s. with A. P. ammunition and 2430 f. s. with H. E. ammunition are obtained. It has a penetration performance of 7/8-in. homogeneous plate at 20° at 200 yards, and 1/2-in. at 20° at 850 yards. The effective range is believed to be 600 yards. The maximum weight lifting capacity of the belt, which is of the disintegrating metal link type, is 62-lbs.

3. So far as is known four types of ammunition are believed to be used in this equipment and these are shown in the drawing at Plate A. Only three of these projectiles have actually been examined at Kirkee and these are indicated on the drawing by a 'V'. A chart summarising all the data available on these rounds is also included at the end of this Leaflet.

DESCRIPTION

CARTRIDGE CASE

4. The case is of brass of the rimless S. A. A. type with a slight taper towards the neck and is 3.7-ins. long. A primer Type G, described in J. A. L. E. 2 (b), is pressed into the base of the case. The case is slightly necked and is secured to the projectile by 3 long or 6 short indents.

PROPELLANT

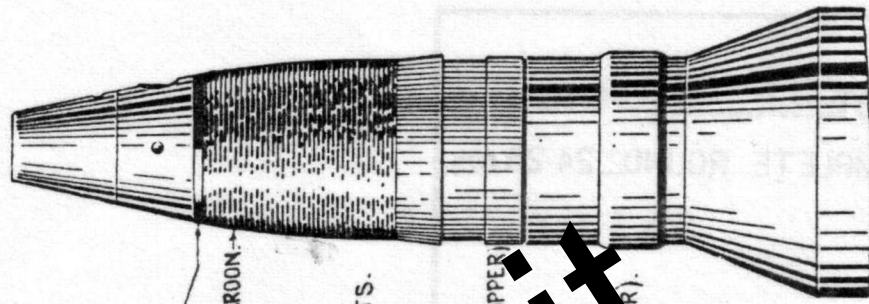
5. In the cartridges examined at Kirkee the propellant charge consisted of graphited tubular grains of N. C. stabilised with D. P. A. and D. N. T., a small piece of lead/tinfoil being incorporated as a decoppering material. Other rounds, not examined here, are reported to use an N. C. propellant containing a small quantity of N. G. For details see chart at end of Leaflet.

PROJECTILES

6. A. P. /Tracer. This is a solid steel shot recessed at the base to take the tracing and priming compositions and closed by a perforated screwed plug. The projectile is painted black with one green band round the middle and gives a red trace when fired.

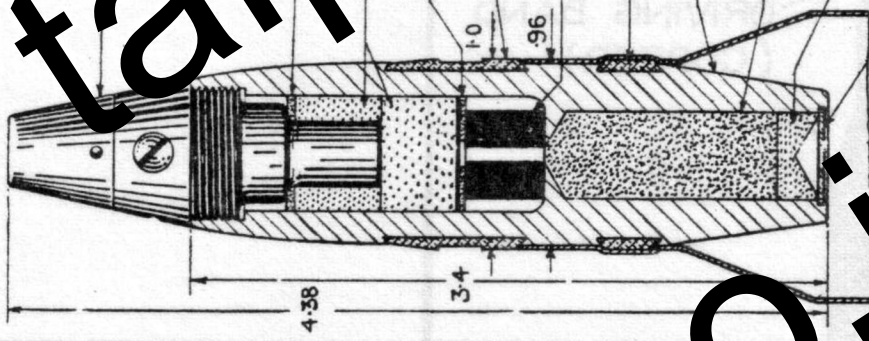
COLOUR MARKINGS AND PROJECTILE DATA

Colour	Nature	Shell Body Type	Filling	Colour of Trace
Maroon	H.E.	B	TNT or Tetryl	—
Maroon with 3-mm. green band at nose	H.E.	B	Aluminized TNT	—
Brown	H.E.	B	Aluminized TNT	—
Green	H.E./T	B	Aluminized TNT and cannister of white phosphorus	—
Orange (1)	H.E./T	C	TNT or C.E. (2 pressed blocks)	Red
(2)	H.E./T	A	TNT or C.E. (3 pressed blocks)	Red
Orange with 3-mm. green band at mouth of shell	H.E./T	A	Aluminized TNT	White
Blood Red (1)	H.E./T	A	Aluminized TNT	White
(2)	H.E./T S.D.	D	Aluminized TNT and a gunpowder pellet	White
Blood Red with 3-mm. green band at nose	H.E./T	A	Aluminized TNT	White
Black with white tip and white band above driving band	A.P./T	—	Kieselguhr	White



FUZE D.A. TYPE 1 (R.H.T.).
 GREEN BAND.
 BODY (STEEL) PAINTED MAROON.
 FELT WASHER.
 ALUMINISED T.N.T. PELLETS.
 FELT WASHER.
 FORWARD DRIVING BAND (COPPER).
 PERFORATED U.P. PELLETS.
 REAR DRIVING BAND (COPPER).
 PAINTED BLACK.
 TRACING COMPOSITION.
 PRIMING COMPOSITION.
 RETAINING DISC.
 CARTRIDGE CASE (BRASS).

H.E. TRACER. SELF-DESTROYING.
(SHORT BODY).

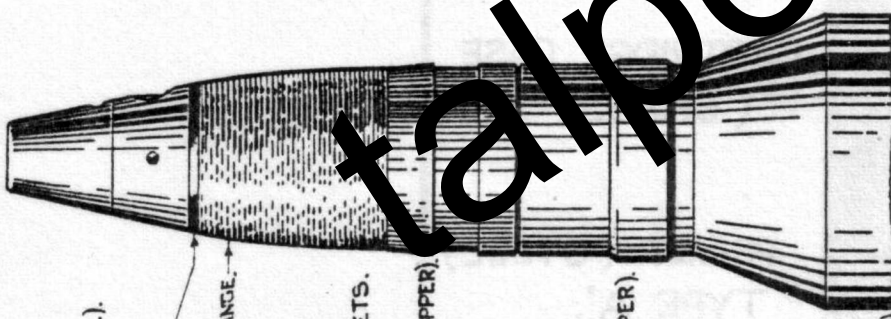


4.38

3.4

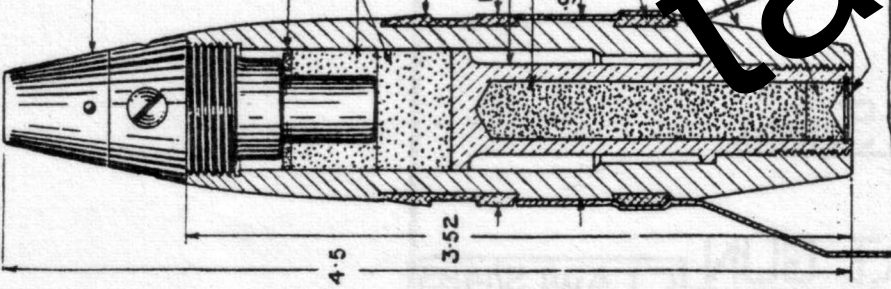
1.0

.96



FUZE D.A. TYPE 1 (R.H.T.).
 GREEN BAND.
 BODY (STEEL) PAINTED ORANGE.
 FELT WASHER.
 ALUMINISED T.N.T. PELLETS.
 FORWARD DRIVING BAND (COPPER).
 TRACER CONTAINER.
 TRACING COMPOSITION.
 REAR DRIVING BAND (COPPER).
 PAINTED BLACK.
 PRIMING COMPOSITION.
 RETAINING DISC.
 CARTRIDGE CASE (BRASS).

H.E. TRACER.
(LONG BODY).



4.5

3.52

1.0

.96

JAPANESE CARTRIDGE S.A. 25 MM.
FOR TYPE 96 NAVAL A.A./A.T. GUN.

DIMENSIONS IN INCHES.

WT. OF SHELL FUZED (FILLED).....8.9 ozs.

WT. OF SHOT.....9.8 ozs.

WT. OF COMPLETE ROUND FUZED...23.2 ozs.

WT. OF COMPLETE ROUND...24.25 ozs.



JAPANESE
CARTGE. S. A. 25MM.
FOR
TYPE '96 NAVAL AA./A.T. GUN

C.I. AMN. S/1495
 KIRKEE. JULY 46