

*Joe Dempsey*

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**HANDBOOK**  
**FOR**  
**20 MM. SMALL ARM AMMUNITION**

**LAND SERVICE**

**1943**

By Command of the Army Council

*L. D. D. D.*

THE WAR OFFICE,  
15th January, 1944.

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## 20 MM. SMALL ARM AMMUNITION

### GENERAL

1. Two distinct kinds of 20 mm. ammunition are used in the land service. They are the Hispano, which can only be used in Hispano guns, and the Oerlikon, which can only be used in Oerlikon and Polsten guns. The two kinds may be readily distinguished by the differences in the contour of the cartridge case (Fig. 1).

HISPANO.

OERLIKON.

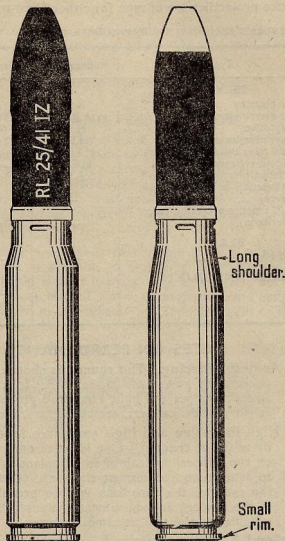


Fig. 1

2. In both cases a complete round consists of a projectile secured in the mouth of a cartridge case containing a propellant charge and a percussion cap.

3. Service projectiles are of three main types :—

- (a) Solid, except for tracer cavity, e.g., A.P./T.
- (b) Hollow, with a base plug, e.g., ball.
- (c) Fuzed shell, e.g., H.E/I.

Practice projectiles are of type (b) either filled tracer or empty.

The types most likely to be encountered are :—

Type	Abbreviation	Hispano	Oerlikon
<b>SERVICE</b>			
Armour piercing ... ..	A.P.	Yes	—
Armour piercing/tracer ... ..	A.P./T	Yes	Yes
High explosive ... ..	H.E.	Yes	Yes
High explosive/incendiary ... ..	H.E/I	Yes	Yes
High explosive/incendiary/tracer ... ..	H.E/I/T	—	Yes
High explosive/tracer ... ..	H.E.T.	—	Yes
Semi-armour piercing/incendiary ... ..	S.A.P./I	Yes	Yes
Ball (" Practice projectile " for Oerlikon) ... ..	—	Yes	Yes
Tracer (" Practice projectile/tracer " for Oerlikon) ... ..	—	Yes	Yes
<b>BLANK</b>			
Bulleted blank ... ..	—	—	Yes
<b>DRILL AND DUMMY</b>			
Drill ... ..	—	—	Yes
Dummy... ..	—	Yes	—

### NOTES ON PERFORMANCE

- (a) **Armour piercing.**—This round has about three times the penetrating power of .303-in. A.P. It is useful against aircraft engines and light armoured ground targets such as gun shields, carriers, armoured cars, etc.
- (b) **High explosive and high explosive incendiary (with or without tracer).**—One hit with one of these rounds on the self-sealing tank of an aeroplane will be sufficient to set fire to and disrupt the tank. Lethal damage to the crew of the aeroplane will be probable with a hit in the fuselage anywhere near them. This round is not suitable for use against armour plate.
- (c) **Semi-A.P. incendiary** will penetrate the armour found in aircraft which protects pilots and engines and will have an incendiary effect on the ammunition, carburettors,



fuel pipes, etc., which are protected by armour. The armour piercing performance is not so good as that of the plain A.P. round, but severe damage can be done nevertheless to engines, main spars, etc.

4. All explosive shell are fitted with direct-action percussion fuzes detonating on impact. When assembled to the shell the fuze is perfectly safe under normal conditions of service usage, **but fuzes must not be removed from the shell or dismantled or interfered with in any way, as a serious accident is liable to occur.**

5. Drill cartridges are for magazine filling practice only and are not to be loaded into the guns. (Applies to Oerlikon and Polsten).

6. Bulleted blank is not an issue at the moment.

### CARE AND PRESERVATION

7. Ammunition must be treated intelligently and reasonably, and every effort must be made to give it the care and protection necessary to maintain it in a serviceable condition. It should be protected against moisture, extremes of temperature and exposure to the direct sunlight. It must not be handled roughly and must be kept clean and free from rust. Service ammunition must not be used for drill purposes.

8. The unit commander is responsible for the ammunition in his charge, and in addition to arranging for a methodical daily inspection, should inspect it personally, at frequent but irregular intervals, to assure himself that it is serviceable and has not been neglected. When in any difficulty, he should consult an inspecting ordnance officer.

9. Packages are not to be opened unnecessarily. Large quantities should be separated into small stacks, which should be kept off the ground by duckboards, dunnage or other material. Adequate ventilation should be arranged between individual packages and between the stacks, which should be covered with tarpaulin or some similar arrangement.

### PACKING

10. The package containing the ammunition will vary according to the country of origin. British and Canadian manufactured ammunition is issued in boxes containing 60 rounds. That made in the U.S.A. is packed 180 rounds Oerlikon or 120 Hispano in a single package. Oerlikon of Swiss manufacture is normally greased before packing and is contained in boxes with a capacity of 300 or 100 rounds. Particulars are as follows :—

Country of Origin	Nature of ammunition
Britain and Canada ...	Hispano and Oerlikon
U.S.A. ...	Hispano
U.S.A. ...	Oerlikon
Switzerland ...	Oerlikon
Switzerland ...	Oerlikon

The H.32 and H.45 boxes will be superseded and will hold 60 rounds Oerlikon and 66 rounds Hispano 14½ in. and the lid will be fastened by two screws. Pamphlet.

No.	Type	Contents	Approximate filled weight ; pounds	Dimensions. Inches
H.32	Wood with metal lining.	60 rounds in 6 cartons No. 12, each containing 10.	48	$8\frac{1}{4}$ in. $\times$ $17\frac{3}{4}$ in. $\times$ $9\frac{3}{4}$ in.
H.45			50	8 in. $\times$ 17 in. $\times$ $9\frac{1}{8}$ in.
	Wood with metal lining.	120 rounds in 10 cartons, each containing 12.	97	$17\frac{3}{4}$ in. $\times$ $13\frac{3}{16}$ in. $\times$ $10\frac{11}{16}$ in.
	Steel case.	180 rounds.	120	$18\frac{1}{2}$ in. $\times$ $9\frac{1}{2}$ in. $\times$ 13 in.
	Wood with metal lining.	300 rounds, each in a cardboard tube.	210	$21\frac{1}{4}$ in. $\times$ $19\frac{3}{4}$ in. $\times$ 14 in.
	Wood with metal lining.	100 rounds, each in a cardboard tube.	50	21 in. $\times$ $11\frac{1}{4}$ in. $\times$ 11 in.

replaced by a more robust box which is being developed. This is a wooden box with a tin liner rounds Hispano in an "egg box" type packing. The approximate size will be 10 in.  $\times$  11 in.  $\times$  9 in. Further details are not yet available and will be published in an amendment to this



## MARKING

11. Ammunition and its packages are marked to facilitate identification, and the markings call for particular attention due to the fact that :—

- (a) Although the guns concerned are all of the same calibre, they do not all take the same ammunition.
- (b) There are various types of Hispano and Oerlikon ammunition, and when rounds are separated from their packages, they can be readily identified only by the colour of the projectile.

## DISTINGUISHING MARKS ON PROJECTILES

12. Unless care is exercised, confusion is likely to arise when distinguishing between certain of the Oerlikon projectiles. Many of these, although of the same basic colour as others, are of obviously different shades. In some cases, those having the same basic colour are in the same category of projectile, but that is not so in all cases and reference must therefore be made to the coloured diagram. This difficulty will not arise with Hispano projectiles. Typical examples of Oerlikon rounds which may occasionally closely resemble each other, are detailed in the following two groups :—

American, H.E.	...	...	...	...	White.
American H.E./T.	...	...	...	...	Light grey.
British practice projectile (ball round)	...	...	...	...	Greenish grey.
British practice projectile/tracer (tracer round)	...	...	...	...	Sage green.
British H.E./I/T	...	...	...	...	Bright green.

13. The colour markings of Swiss manufactured Oerlikon projectiles are given in the diagram, but it is unlikely that such ammunition will be encountered. These projectiles have no other markings.

14. The dummy cartridges supplied with the Hispano gun have three holes in the cartridge case to distinguish them from other rounds. The projectiles have no markings other than the distinguishing colour.

15. The projectiles in the bulleted blank and the Mark II (wooden) drill rounds, issued for use with the Oerlikon, have no stamped or stencilled markings on them.

## 16. DISTINGUISHING COLOURS OF PROJECTILES

Type of projectile	HISPANO Manufactured in		OERLIKON Manufactured in		
	Britain and Canada	U.S.A.	Britain and Canada	U.S.A.	Switzerland
A.P. ... ..	Black with white tip (a).	—	—	—	—
A.P./T. ... ..	Black with white tip*	Black (b).	Black with white tip.	—	—
BALL (called Practice projectile for Oerlikon).	Black.	Black.	Greenish grey.	Greenish grey.	Greenish grey.
H.E. ... ..	Buff.	Yellow.	Buff.	White or yellow (c).	Brown.
H.E./I. ... ..	Upper half—Buff. Lower half—Red (d).	Upper half—Yellow. Lower half—Red (d).	Signal red.	Red or pink (c).	—
H.E./T. ... ..	—	—	Light blue.	Light grey or dark blue (c).	Blue.
H.E./I/T. ... ..	—	—	Bright green.	—	—
S.A.P./I. ... ..	Red with white tip.	—	Red with white tip.	—	—
TRACER (called Practice projectile tracer for Oerlikon).	Black.*	—	Sage green.	Greenish grey with $\frac{1}{8}$ in. yellow band.	Green.
BULLETED BLANK ...	—	—	Unpainted. Yellow coloured leather-board or black plastic.	—	—
DRILL (Mark I) ... ..	—	—	Black.	—	—
DRILL (Mark II) ... ..	—	—	Unpainted hard-wood.	—	—
DUMMY ... ..	Black.	—	—	—	—

(a) Early issues also have a white band below the white tip.

(c) According to nature of high explosive filling.

(b) Stencilled in white—**SHOT, A.P. WITH TRACER.**

(d) Tip coloured to denote fuze that is fitted.

\* British Hispano containing tracer has the symbol (T) stencilled in red on the projectile.

# **17. TYPICAL MARKINGS ON COMPLETE ROUND ADDITIONAL TO COLOUR OF PROJECTILE (STAMPED OR STENCILLED)**

Position	HISPANO Made in		OERLIKON Made in			Significance
	Britain and Canada	U.S.A.	Britain and Canada	U.S.A.	Switzer- land	
Annulus of cap	Lac- quered purple.	—	—	—	—	Hispano.
Base of cart- ridge case. (Fig. 2)	—	—	Painted red	—	—	Denotes Mark drill cartridge. Calibre.
	20 MM	20 MM	—	20 MM	—	
	—	M 21	—	Mk. II	—	Model number.
	—	—	Oe	—	—	Oerlikon.
	R.L.	F.A.	R.L.	F.A.	A.B.	Manufacturers' initials (or trade mark).
	42	1941	41	1943	—	Year of manufac- ture.
	—	—	—	—	123	Material lot num- ber.
	—	Lot 471 =P.A.	—	—	—	Lot number and filler's initials (or symbol).
	—	—	Z	—	—	Neonite propel- lant.
	—	—	—	—	CD	Initials of filler.
	—	—	—	—	43	Date of filling.
	—	—	—	—	456	Lot number com- plete round.
	—	—	DII	—	—	"DRILL" and mark.
Side of cart- ridge case.	—	—	—	CD	—	Initials of filler.
Body of pro- jectile.	—	—	—	34	—	Filled lot number. "DUMMY."
	Three holes	—	—	—	—	
	I	—	—	—	—	Mark of round.
	Z	—	—	—	—	Neonite propel- lant.
	—	—	—	M75.A	—	Model number fol- lowed by revision letter.
	R.L.	F.A.	R.L.	—	—	Fillers' initials (or trade mark).
	25/42	25/42	—	—	—	Lot number and year of manufac- ture.
	—	—	34	—	—	Filled lot number.
	—	—	—	3-43	—	Month and year of manufacture.
	—	—	DI	—	—	In red when dark ignition tracer fitted.
	C.E.	—	—	—	—	Nature of filling in H.E. shell (T.N.T., P.E.N., C.E., etc.).

17 (cont.) **TYPICAL MARKINGS ON COMPLETE ROUND**  
**ADDITIONAL TO COLOUR OF PROJECTILE**  
**(STAMPED OR STENCILLED)**

Position	HISPANO Made in		OERLIKON Made in			Significance
	Britain and Canada	U.S.A.	Britain and Canada	U.S.A.	Switzer- land	
(T)	—	HE	—	—	—	Nature of projec- tile.
—	—	—	—	—	—	In red when tracer is filled.
—	—	20G	—	—	—	Calibre of gun, as opposed to "20H" denoting howitzer.
—	—	M75	—	—	—	Model number (a).
—	—	—	DRILL	—	—	Stencilled in white on (a) Mark I drill round.

(a) On A.P. shot only.

The above table details the stamped or stencilled markings that may be found, and their significance. It does not necessarily follow that the whole of the expected markings will be found on any particular round, and it is also possible that in some cases marks will be found additional to those detailed above.



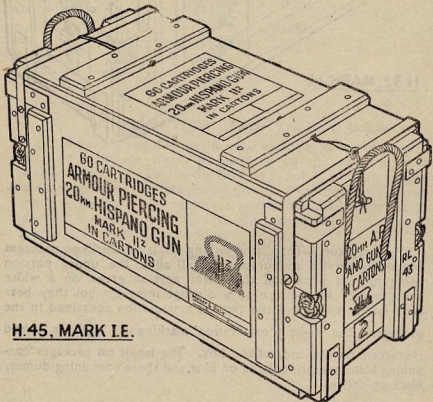
Fig. 2

## MARKINGS ON PACKAGES

### AMMUNITION MADE IN BRITAIN AND CANADA

18. **Hispano.**—Packages containing service ammunition have a large distinguishing label on each side and a smaller one on the top, all printed green on a white background. (On packages containing non-lethal ammunition, the details are printed black on a cerise or terra-cotta background.) These labels are in addition to the usual explosive group labels and linen station seals, and each shows the number, type, mark, and method of packing the rounds contained in the package. The lid and end labels also bear a distinctive symbol to denote the type of ammunition. A raised metal numeral "2" is fixed to each end of the box to assist identification at night. The cartons containing the rounds are secured with a strip band printed to show the quantity, type, calibre and mark of the ammunition and the gun with which used.

### BRITISH PACKAGES

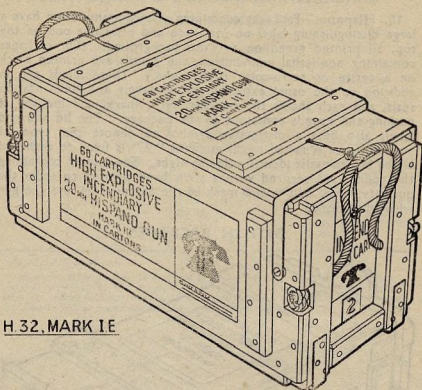


**H.45, MARK I.E.**

Fig. 3



## BRITISH PACKAGES—continued



H.32, MARK I E

Fig. 4

19. **Oerlikon.**—The distinguishing labels on Oerlikon packages containing service ammunition are all alike, the upper portion being printed black and the lower portion green on a white background. In addition to a distinguishing symbol they bear code letters to denote the type of ammunition contained in the package. The night identification marking is "2" in raised characters on the ends of the box. The labels on packages containing blank are printed red on blue and those containing dummy black on cerise.

20. Boxes having a red band around each end contain ammunition originally produced for Naval service. Those having blue bands contain practice ammunition.



# OERLIKON PACKAGES LABEL



BLACK  
LETTERS.

GREEN LETTERS.



SYMBOL.

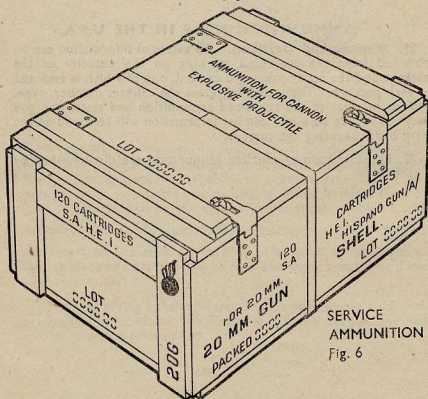
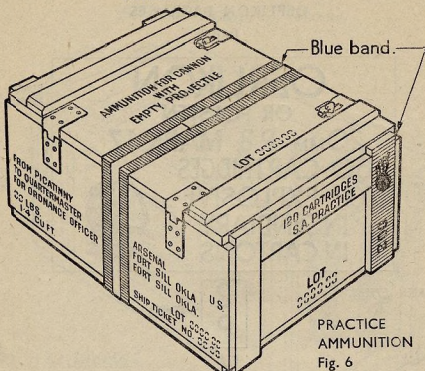
Fig.

## AMMUNITION MADE IN THE U.S.A.

21. **Hispano and Oerlikon.**—All essential information can be obtained from the stencilled marking on the exterior of the package and the accompanying data card, one of which is enclosed in each package. The stencilling gives the calibre, number, type, and lot number of the contained ammunition and states the gun in which it is to be used. Similar information will be found on the strip bands securing the cartons.

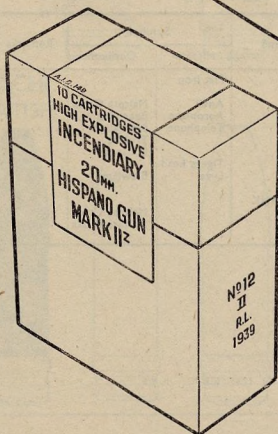
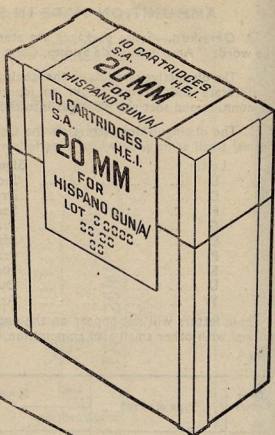
22. Boxes containing practice ammunition are distinguished by a blue band.

## AMERICAN PACKAGES



# AMERICAN CARTON

Fig. 7



# BRITISH CARTON

Fig. 7

## AMMUNITION MADE IN SWITZERLAND

23. **Oerlikon.**—Swiss packages are stencilled on the lid with the words "Ammunition de Surete, Class C" in red.

24. The distinctive symbols on the labels permit the employment of illiterate and foreign labour to identify particular kinds of ammunition and sort the packages into their respective groups.

25. The distinguishing letters on the Oerlikon labels are in the normal small arms code which is as follows :—

Letter					Significance
B	...	...	...	...	Incendiary.
D	...	...	...	...	Drill.
F	...	...	...	...	Semi-armour piercing.
G	...	...	...	...	Tracer.
L	...	...	...	...	Blank.
P	...	...	...	...	Practice.
R	...	...	...	...	High explosive.
U	...	...	...	...	Dummy.
W	...	...	...	...	Armour-piercing.

These letters will not appear on the ends of the packages as is normal with other small arm ammunition.

26.

Code letters	Type of round	Symbol		Remarks
		Hispano	Oerlikon	
W	A.P.	Flat iron		
W.G.	A.P./T.			
R	BALL	Anvil	Maltese Cross	
R.B.	H.E./I.	Aeroplane	Beer Mug	
R.G.	H.E./T.	Telephone	Searchlight	
R.B.G.	H.E./I/T.		Trident	
F.B.	S.A.P./I.		Bollards	
G	TRACER	Tigers head		
P	PRACTICE	Lyre	Blowlamp	
L	BULLETED BLANK			
D	DRILL		Maltese Cross	
U	DUMMY		Maltese Cross	

# HISPANO. DISTINGUISHING COLOURS OF PROJ

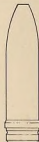
A.P.  
BRITISH



A.P./TRACER  
BRITISH U.S.A.



S.A.P./INCENDIARY.  
BRITISH



H.E./INCENDIARY.

BRITISH.



U.S.A.



BALL.

BRITISH

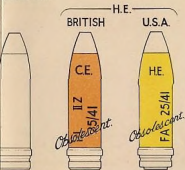


U.S.A.

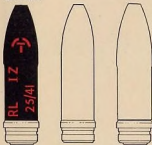


ECTILES.

PLATE I.



TRACER.  
BRITISH.





# OERLIKON. DISTINGUISHING COLOURS OF PROJECTILES.

PLATE II.

A.P./TRACER.  
BRITISH.



S.A.P./INCENDIARY.  
BRITISH.



H.E./I/TRACER.  
BRITISH.



BRITISH.



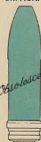
H.E./INCENDIARY.  
U.S.A.



U.S.A.



H.E./TRACER.  
BRITISH.



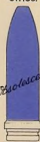
U.S.A.



U.S.A.



SWISS.



BRITISH.



U.S.A.



H.E.

U.S.A.



SWISS.



# OERLIKON.

PLATE III.

## DISTINGUISHING COLOURS OF PROJECTILES.

### PRACTICE PROJECTILE.

BRITISH.



U.S.A.



SWISS.



3 BALL ROUNDS.

*Obsolescent*

3 TRACER ROUNDS.

### PRACTICE PROJECTILE/TRACER.

BRITISH.



U.S.A.



SWISS.



*Obsolescent*

### DRILL.

BRITISH.



BRITISH.



MARK I.

MARK II.



HARD WOOD PROJECTILE.

