

## DEMS Armaments

### Introduction

According to Hague - [Ext Ref 18](#),

*Defensively Equipped Merchant Ship (DEMS) was an Admiralty Trade Division program established in June, 1939, to arm 5,500 British merchant ships with an adequate defence against enemy submarines and aircraft. The acronym DEMS was used to describe the ships carrying the guns, the guns aboard the ships, the military personnel manning the guns, and the shore establishment supporting the system.*

The immediate objective was to provide merchant ships with a gun mounted aft to fire at surface submarines, and anti-aircraft guns to ward off airborne attacks. 3,400 merchant ships were so armed by the end of 1940, and all of them by 1943. Various naval guns of between 3" and 6" calibre left over from WW1 were put to use as nothing else was available initially.

It was no mean feat to modify all these ships. Shipyards had to provide accommodation for the DEMS personnel and strengthen the vessels to support the various types of guns.

This page contains information from various sources describing the weapons used by DEMS gunners in Defensively Equipped Merchant Ships and is cross-referenced from a number of Recollections on this site.

### The Bofors gun

According to [Ext. Ref. 14](#), (which has numerous photos of these guns)

*Probably the best heavy MG AA weapon of World War II, Bofors guns of this type are still in service even today. This weapon was used on almost every major US and UK warship of World War II and was a very potent AA gun. The Germans used Norwegian-produced Bofors guns which they designated as the 4 cm/56 Flak 28 and the Japanese copied a British Army air-cooled Bofors captured at Singapore to produce their 4 cm/60 Type 5.*

*This weapon traces its roots back to a 1918 Krupp design - the Bofors Company was partly owned by German interests until 1930 - but the finished product was entirely a Bofors design owing little or nothing to the Krupp version. The first prototype was finished late in the summer of 1930 and the first automatic shots were fired on 17 October 1930. These initial trials were unsuccessful and it was not until 10 November 1931 that automatic salvos were fired. Official trials for the Swedish Navy took place on 21 March 1932. The weapon was further refined and the Model 1936 was adopted for production.*

*The British Army first showed interest in these guns in 1933 and placed an order for 100 of them in 1937. First Royal Navy shipboard use of air-cooled guns was in late 1941 aboard the battleships Prince of Wales and Nelson and on the cruisers Manchester and Erebus, although some ships had earlier been temporarily armed with Army air-cooled guns that had been "rescued" during the evacuation of the Norway invasion forces in 1940. The British water-cooled version was developed from the Dutch Hazemeyer mounting which had arrived in Britain in 1940 aboard the Dutch minelayer Willem van der Zaan. The first issue of locally produced water-cooled Bofors guns was to the Black Swan class sloop HMS Whimbrel in November 1942.*

*The total number of air-cooled guns built by Australia, Britain and Canada is not accurately known but was somewhere between 2,100 and 2,800 plus about 200 to 400 guns supplied from the United States. Water-cooled guns are better documented with 442 Mark IV and 342 Mark XI in service at the end of the war plus 786 water-cooled guns supplied by the USA. These USA weapons had been sent to Britain as a part of Lend-Lease or else were installed on ships refitted in USA shipyards.*

**Image 1** shows a 40 mm Bofors anti-aircraft gun on Boffin mounting on HMCS Haida. The gun was available in different configurations - e.g. a dual barrel version.



According to the website [Ext. Ref #15](#):

*HMCS Haida is the the last remaining example of the 27 Tribal Class destroyers built for the Royal Canadian Navy, the Royal Navy and the Royal Australian Navy between 1937 and 1945. It has been said that The Tribals were "magnificent in appearance, majestic in movement and menacing in disposition". Technologically, they represented the most advanced naval architecture, marine propulsion systems and weaponry of their time.*

She is preserved at the AIDA National Historic Site, Hamilton, Ontario and is open to visitors.

The Bofors gun came in various forms and was used on land as well as sea. A Google search will reveal a great deal of information about these guns for those wanting to find out more.

### The Hotchkiss 25mm autocannon

The type of Hotchkiss gun used by DEMS has yet to be confirmed, but it is believed to have been the 25mm autocannon.

This anti-aircraft gun was designed by the French firm of Hotchkiss for the French military. It was rejected as being too slow-firing but was proposed for manufacture for export. With the pressures of war and the lat delivery of the Schneider 37mm autocannon, the decision was changed and guns due for export to Romania were kept for use by the French forces.

The weapon was used during WW2 by French, Japanese and other nations' forces.

To date no photos have been found apart from military versions of this gun. This page will be updated when a photos of naval version is located.

### The Lewis gun

There is a excellent short history of the Lewis Gun in [Ext. Ref. #16](#) from which the following extract has been copied:

*Although several automatic rifles or light machine guns had been fielded in the period leading up to the outbreak of war in 1914, only one was to prove itself entirely satisfactory in the shell-blasted mud of World War I. This was the gun -- an American invention at first rudely spurned by its home country, but enthusiastically embraced by the Belgians and the British. Turned out by the tens of thousands before the war's end, it was far superior to its enemy counterpart, the German "light" Maxim machine gun.*

It was referred to as the "stripped" Lewis because Isaac Lewis had taken as his starting point a rather complex weapon designed by Samuel McLean that was impractical and stripped away all the surplus stuff.

The Lewis gun proved itself on land, air and sea and was fitted to armoured cars, tanks, motorcycles ,

ships, airships and aeroplanes. Although superseded by better weapons by the time of WW2, many were still in use and deployed for defensive purposes included anti-aircraft use by DEMS.

Image 2 shows a Lewis gun as used by the army.

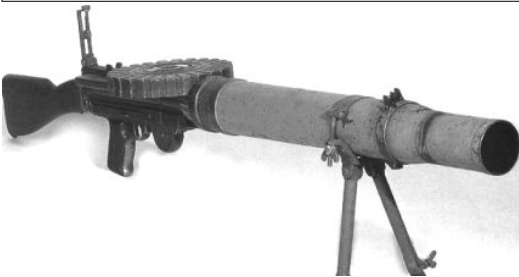


Image 2

Image 3 shows a group of Canadian DEMS gunners learning to fire a Lewis machine gun, Esquimalt, British Columbia, Canada, 15 March 1944



Image 3

#### The Marlin gun

[According to Ext. Ref. #11.](#)

*This machine gun was developed by the Marlin-Rockwell Company in 1918 as part of their contract to produce the Colt M1895 machine gun. They were given the additional task of producing this weapon in a role more suited to aircraft use.*

*The original design, known as the Potato-Digger, had a hinged arm which was driven by gas tapped from the barrel, and swung downwards, operating the linkage that actuated the breech mechanism. This swinging arm was incompatible with aircraft installations, and the Marlin engineers replaced it with a conventional gas piston beneath the barrel.*

*In this form the gun was adopted as the standard aircraft and tank machine gun for United States forces in 1918. The end of the war brought cutbacks, and a total of 38,000 aircraft, and 1,470 tank guns were made.*

*In 1940, the British were desperately short of arms of all kinds, and several thousand of these weapons were taken out of storage in the USA and shipped to Britain. Most were mounted on merchant vessels and at airfields as a defence against air attack.*

Image 4 is a Marlin machine gun.



Image 4

#### The "Pig Trough"

Pig Trough was the code name for a weapon introduced onto RN ships in the beginning of WW2. It was a pivoted launcher capable firing up to 14 rockets vertically from the deck of a ship as a counter to aircraft attack

Researching this weapon I was amazed to discover that it had been designed by Neville Shute Norway - the real name of the novelist Neville Shute. The following information comes from [Ext. Ref. #13](#)

He was a British-born Australian aeronautical engineer who worked for the de Havilland Aircraft Company, then Vickers Ltd. He was the Chief Calculator (stress engineer) on the R100 Airship project for the subsidiary Airship Guarantee Company and was promoted to Deputy Chief Engineer of the R100 project under Sir Barnes Wallis in 1929. The crash of R101 ended work on airships.

In WW2 he joined the Royal Naval Volunteer Reserve as a sub-lieutenant and soon ended up in what would become the Directorate of Miscellaneous Weapons Development. This unit worked on a large number of projects including:

- The Acoustic Warning Device (AWD) - fitted ultimately to 600 merchant ships but subject to false alarms
- Fresh water stills
- Panjandrum - a huge wheel shape device for delivering large explosive charges - it was abandoned after many failure (which are hilarious to watch)
- A number of glider projects including one to produce smoke screens
- The "Pig Trough" rocket launcher
- Other rocket-powered devices called "Radiator" (another gimballed multiple rocket launcher), the Harvey Projector and the Pillar Box.

So far only one photograph of a "Pig Trough" weapon has come to light and that is in the UK National Archives; it is not reproduced here because this publicly funded body wanted to charge a fee of £40 plus V.A.T. to use it and I am seeking an alternative. I am sure all readers will agree that this is disgraceful.

#### The "Pillar Box"

Pillar Box was the code name for another early WW2 rocket launching system and there is very limited information about it online. It had a circular box with an aimer in the central seat and ten 2" high explosive rockets at each side.

Image 5 is believed to be a Pillar box installation but this is unconfirmed at present. It certainly seems to match the description in terms of the number of rockets and the location of the aimer.



A member of the Ships Nostalgia website known as Sidsal provided the following information:

*"we had a "pillar box" on the poop - mounted on a raised platform. The gun layer ( Maritime Regiment RA) was inside the contraption and I was 2nd man. It could be rotated and the rocket frames aimed up and down. My job was to station myself under the platform at the phone and after firing to climb the ladder to see if all the rockets had gone. There were 2 rows of rockets on each side and the gun layer could fire the outer or the inner rockets together. When they were fired the rockets clashed against each other and went off in all sorts of directions. Once , in the Meddy, rockets had been fired and I climbed the short ladder to peer over an just then the other rockets went off and I promptly slid back down with my hair and eyebrows well singed."*

#### Oerlikon 20mm Autocannon

The Oerlikon Autocannon was designed by Reinhold Becker during WW1. It is capable of firing 450 rounds per minute with a muzzle velocity of 820 metres/sec and a range of 2,000 metres when used as an anti-aircraft weapon.

In 1919 the patent was sold to Seebach Maschinenbau Aktien Gesellschaft (SEMAG) in Switzerland. SEMAG was itself taken over by Werkzeug Maschinenfabrik Oerlikon shortly afterwards. These guns were used extensively by the Germans and Japanese - particularly in versions adapted for use in aircraft.

The Royal Navy showed no interest in using the weapon as an anti-aircraft gun initially, but finally ordered a batch of 1,500 of them in 1939. In fact only 109 guns were delivered due to the fall of France. However a few weeks before the Fall of France, the Oerlikon factory approved manufacture under licence in the UK and the RN smuggled the drawings and documents from Zürich. Production of British-made Oerlikon guns started in Ruislip, London, at the end of 1940 and the first guns were delivered to the Royal Navy in March or April, 1941.

The Oerlikon was better than the lighter weapons previously available to DEMS gunners, but lacked stopping power and was superseded by the Bofors gun which became the anti-aircraft weapon of choice .

**Image 6** shows a 20mm Oerlikon gun on HMAS Castlemaine Bathurst-class corvette, berthed at Gem Pier, Williamstown, Victoria, Australia.

Image 6



**Image 7** shows "nests" for the Oerlikon guns on the tanker San Emiliano. They are either side of the bridge with rope ladders leading up to them. The guns themselves cannot be seen in this photo.

Image 7



#### Naval Guns

Various guns of various sizes (between 3" and 6" calibre) were deployed for use against surfaced submarines. Those fitted initially were old naval guns that had been stored after WW1.

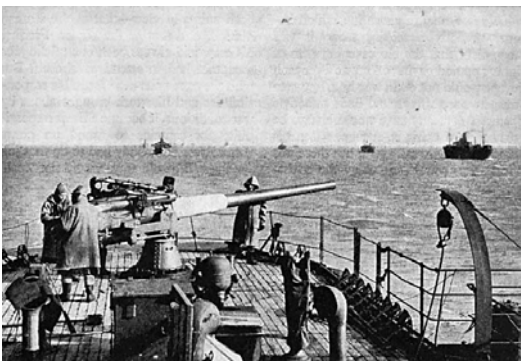
**Image 8** shows a 4.7" gun being lowered into place on a merchant ship.

Image 8



**Image 9** shows the gun crew of an oil tanker cleaning a 4.7" gun as their convoy reaches home port. There is an outgoing convoy on the right. There does not appear to be any protection for the gunners in this case.

Image 9



**Image 10** shows Stan Mayes (left) and Mick Snashal (right) on duty at one of the 4.7" guns on the oil tanker San Emiliano.

Image 10



#### Images

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