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CNTHA Chair
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Directorate of History and Heritage Liaison
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Maritime Engineering Journal Liaison
Brian McCullough

Webmaster
Peter MacGillivray

Webmaster Emeritus
Don Wilson

CNTHA News is the unofficial newsletter of the Canadian Naval Technical History Association. Please address all correspondence to the publisher, attention Lt(N) Jason Delaney, Directorate of History and Heritage, NDHQ
101 Colonel By Dr
Ottawa, ON K1A 0K2
Tel. (613) 998-7045
Fax (613) 990-8579

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A Look Back at the RCN's 3"/70-Calibre Gun System

By LCdr (Ret'd) Brian McCullough, CD

Last fall, we featured the story behind the selection of the 3"/50-calibre bow gun for the *Protecteur*-class AORs (see *MEJ* 109). At one time or another, this short-barreled, twin-mounted weapon was carried aboard all of the RCN's 20 steam-driven destroyer escorts, half of which had a 3"//50-calibre fitted both forward and aft. The after Y-mount was later removed from all seven ships of the *St-Laurent* class when they were converted to DDH-class helicopter carrying escorts, as well as from four of the seven *Restigouche*-class ships when they were upgraded with an Anti-Submarine Rocket (ASROC) launcher on the quarterdeck. The two ships of the *Annapolis* class were originally constructed as DDHs, so never carried an after gun.

The remaining 10 steam-driven escorts — including all seven of the *Restigouche* class, and three of the four *Mackenzie* class — were fitted with a longer barreled 3"/70-calibre gun in the forward A-mount position when they were built. The exception was HMCS *Qu'Appelle* (DDE-264), which was the only steamer that carried two of the U.S. designed 3"/50s throughout its entire period of service. Both gun systems fired a three-inch calibre projectile, but the different barrel lengths of '50 calibres' (i.e. 50 x 3 inches, or 150 inches), and '70 calibres' (210 inches), respectively, gave rise to their 3"/50 and 3"/70-calibre designations.

The British twin-mount 3"/70-calibre system was initially designed by Vickers as secondary armament for the Royal Navy's *Tiger*-class cruisers. Like the 3"/50-calibre, it was a quick-firing, dual-purpose weapon that could be used against both air and surface targets, but had somewhat longer reach in both modes. The 1,000 m/s muzzle velocity of the 3"/70-calibre could propel a 6kg high-explosive projectile out to a range of nearly 18,000 metres at 45 degrees elevation, and more than 10,000 metres in high-angle anti-aircraft configuration. The British Mk-6 mounting could elevate the gun to complete vertical at 30 degrees per second, and train the weapon at 60 degrees per second. Targeting was facilitated by a Canadianized Mk-69 gunfire control system, coupled with the AN/SPG-48 X-band radar (later replaced with an SPG-515 radar during the DELEX refits).[1]

Photo by Brian McCullough

A retired RCN 3"/70-calibre gun, with an ASROC mount and 3"/50 gun in the background, on display next to the Canex at CFB Esquimalt, BC.

The 3"/70-calibre weapon featured an active water-cooling system for the barrels so that the gun could maintain a high rate of fire. While the gun was rated for 120 rounds per minute per barrel aboard the Canadian destroyer escorts, the maximum continuous rate was limited to about 90 rounds per minute to prevent overheating. Ammunition was delivered from the magazine below decks via chain hoists to the gun mount, where it was loaded by hand into hoppers to be transferred to continuously rotating feed rings that auto-loaded the gun. Crews likened it to the workings of a bottling plant, or old-style Coca-Cola machine. Spent casings were ejected forward from the base of the gun.

When I served aboard HMCS *Terra Nova* (IRE-259) in the mid-1970s, there was no end of satisfaction in watching as round after round of our dialed-in gun found its target on the gunnery range. However, more professional assessments question whether the dual-purpose 3"/70-calibre gun was entirely

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1. https://www.hazegray.org/navhist/canada/systems/firecontrol/

adequate in an anti-surface/shore bombardment role. According to former HMCS *Gatineau* (IRE-236) Combat Systems Engineer and CNTHA member **Ken Bowering**, the 3"/70-calibre was a great gun when properly maintained, albeit somewhat limited in its capability:

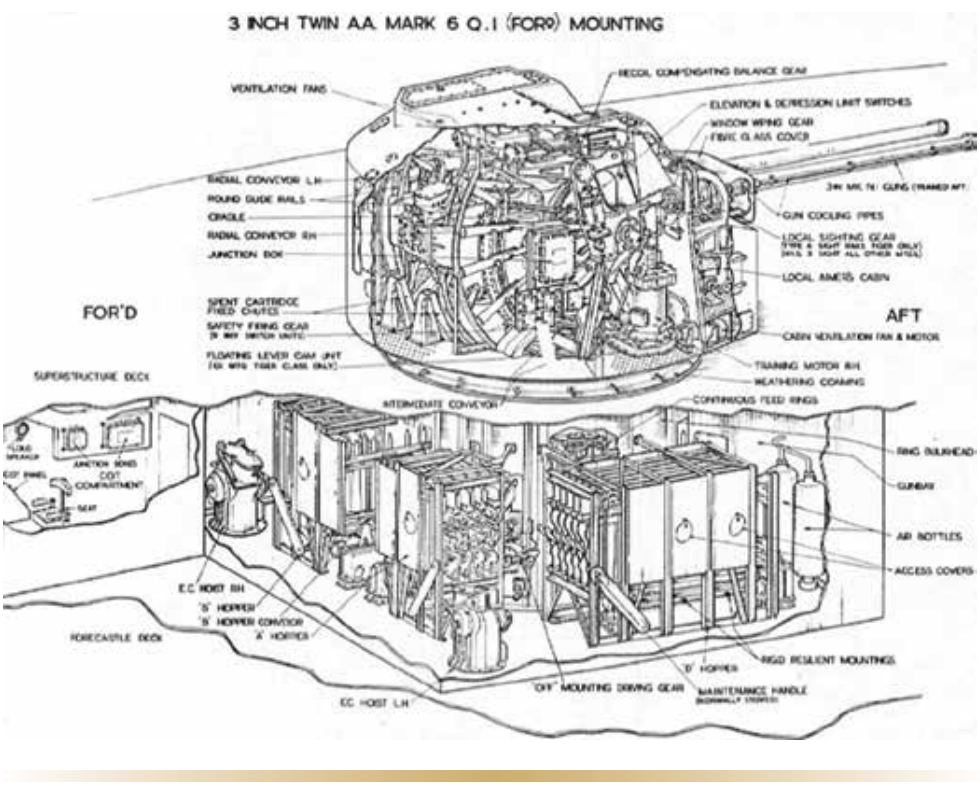
> The gun itself was okay against incoming air targets, but not very effective against large surface targets. Unlike the successes achieved by the RCN destroyers in Korea with their larger guns, the 3"/70-calibre had very little capability in shore bombardment operations because the trajectory was extremely flat over its range. A slight increase in elevation would send the projectile far beyond the intended target, and since the gun did not come with 'false range' tables, the projectile couldn't be 'dropped' in place. It really was just an AA gun.

It is interesting to note that when *Terra Nova* and HMCS *Restigouche* (IRE-257) were rapidly refitted with weapon upgrades for deployment to the Persian Gulf in 1990-1991 (see *MEJs 26 and 27*), both ships carried their original 3"/70-calibre guns into theatre.

The last of the RCN's 3"/50 and 3"/70-calibre guns retired with the steamers, but fortunately a number of these weapons can be seen at various museums and naval units across the country. The Naval Museum of Alberta in Calgary has both on exhibition, along with consoles from the SPG-48 tracking radar and Gunar fire-control computer that controlled these workhorse weapons.

CF Photo HSC-71-327-108

During HMCS *Terra Nova*'s IRE refit in the late 1960s, the after 3"/50-calibre gun mount was replaced with an ASROC system, but the longer-barreled 3"/70-calibre on the fo'c'sle was kept in service. The ship deployed to the crisis in the Persian Gulf with this same gun in 1990.



Gun diagram courtesy The Naval Encyclopedia