

PN STANDARD SHIPBOARD NAVAL GUNS

The standard shipboard naval guns currently available in the PN inventory are mostly of the U.S.-made minor caliber guns - the 3-inch 50 caliber dual-purpose guns, 40MM and 20MM anti-aircraft guns. These are the types of armaments installed in patrol combatants and naval auxiliary ships which were acquired by the Philippine government from the U.S. at the end of World War II. Since their acquisition, the PN has developed the technical expertise in maintaining and extending the operational serviceability of these guns.

During the late 70s, the PN has acquired a relatively modern weapon system as part of its modernization program, the 30MM Emerlec guns, which are now installed in some of its newly-acquired or newly-constructed patrol gunboats. Some modern belt-fed 20MM guns have also replaced the old 20MM AA guns. In line with the enactment of the AFP Modernization Law, plans are in the offing for the PN to acquire some of the latest gun systems, such as the Oto Melara 76MM/62 caliber dual-purpose, rapid-fire guns and the Bofors 40MM AA guns.

Characteristics of Naval Guns in the PN Inventory

a. The 3-inch 50 Caliber (3"/50) Single Gun

The 3"/50 gun is a pedestal mounted, single or semiautomatic firing, dual-purpose gun designed for action against surface and air targets. This was developed by the U.S. towards the end of World War II to combat high altitude bomber aircraft and replace the 40MM and 20MM AA guns. The gun is air cooled, recoil operated and uses a fixed type of ammunition. It can be fired electrically by means of a solenoid key or manually through a firing foot pedal connected to the gun by mechanical linkages at the rate of 20 rounds per minute. The gun is provided with a manual as well as telescopic gun sights and sight setting mechanism to aid in hitting the target and a fuze setting mechanism for setting the projectile's mechanical time fuze. The following are other important data about the gun:

Weight of the gun	- 7,817 lbs
Muzzle velocity	- 2,700 ft/sec
Rifling	- right-hand twist
Number of grooves	- 24
Length of recoil	- 10-11.5 inches
Maximum horizontal range	- 14,600 yards
Maximum vertical ceiling	- 29,300 feet
Effective range (horiz)	- 8,000 yards
Effective range (vert)	- 4,000 yards

The 3"/50 single gun mount is normally manned by a gun crew of nine (9) personnel, maximum, and seven (7), minimum. These personnel with duties indicated are as follows:

a) Gun Captain - he is in charge of gun crew directing the operation of the gun and is provided with sound-powered telephone (SPT) to communicate and take orders directly from the Gunnery Control Officer. He takes station by the hand operating lever at the right side of the breech mechanism of the gun.

b) Pointer - he operates the hand wheel to elevate and depress the gun and keep it pointed in the position angle of the designated target using the manual gun

sight or by setting the horizontal crosshair of the telescopic gun sight to the target in coordination with the Trainer and fires the gun when ordered. He takes station to the left seat of the gun.

c) Trainer - he operates the hand wheel to move the gun to the left or right and keep it trained in the direction of the designated target using the manual gun sight or by setting the vertical crosshair of the gun sight to the target in coordination with the Pointer. He takes station to the right seat of the gun.

d) Sight Setter - he operates the range and deflection scales of the sight setting mechanism as directed and repeats all orders to control. He takes station at the sight setting platform on the left side of the gun at the back of the pointer. In case none is assigned, the Gun Captain acts as the Sight Setter.

e) Fuze Setter No. 1 - he operates the fuze setting mechanism or in the absence of such mechanism, provides himself with a hand wrench for adjusting nose fuze setting of the projectile. He takes station at the fuze setting platform on the left side of the gun. He may be the only Fuze Setter assigned, hence, he should take one round from the ammunition locker, take station at the fuze setting platform on the left side of the gun to set the fuze and prepare to pass the round to the Second Loader.

f) Fuze Setter No. 2 (or Third Loader) - he normally takes out one round from the ammunition service locker for setting the fuze and prepares to pass the round to the Second Loader. He also takes station at the fuze setting platform in front of the Fuze Setter No. 1 on the left side of the Second Loader.

g) Second Loader - he normally stands by to receive the round from the Third Loader and prepares to pass it to the First Loader. He takes station in front of the Third Loader and to the left of the First Loader.

h) First Loader - he normally stands by to trip the salvo latch and receive the round from the Second Loader and prepares to ram the round into the gun. He takes station to a place behind and a little to the left of the gun with his left foot just beyond the danger circle.

i) Hot Shellman - he prepares to catch the ejected hot empty shell coming out of the gun as soon as it is fired. He takes station to a place behind and a little to the right of the gun convenient enough for him to do his job wearing asbestos gloves.

b. **40 Millimeter Anti-Aircraft (40MM AA) Gun**

The 40MM AA gun is a single or automatic firing (rapid firing), recoil operated gun designed for action against dive bombing aircraft or low flying aerial targets but maybe used against surface targets. It maybe a single barrel (Army type), manually (local control) operated, air cooled gun; or, a twin or quadruple barrel (Navy type), manually or automatically (local or gun director control) operated, water cooled guns equipped with power drives for electric or electric/hydraulic operations. This gun uses clip-feed ammunition, consisting of four (4) rounds, which are fired electrically by the gun director firing key and/or manually by pressing the firing foot pedal at the rate of 130-150 rounds per minute. The gun is provided with manual gun sights for giving the necessary lead to allow for target motion during the time of flight of the projectile and also to provide for quick changing of the lead as the position of the target changes. the following are other important data about the gun:

Weight of the gun	- 2,300 lbs
Muzzle velocity	- 2,830 ft/sec
Rifling	- right-hand twist
Number of grooves	- 16
Lenght of recoil	- 7.5 - 8 inches
Maximum horizontal range	- 11,000 yards

Effective range (horiz)	- 5,000 yards
Effective range (vert)	- 2,000 yards

The 40MM AA gun is manned and operated by a gun crew composed of seven (7) members for a twin mount plus two (2) more for each mount with a gun director Mark 51 and five (5) members for a single mount. A quad mount would need as much as 12-15 personnel. These personnel with their duties indicated are as follows:

a) Gun Captain - he is in charge of gun crew directing the operation of the gun and is provided with sound-powered telephone (SPT) to communicate and take orders directly from the Gunnery Control Officer. He takes station to a position to the left and a little to the back of the mount where he can supervise the crew.

b) Pointer - he operates the hand wheel to elevate or depress the gun and keep it pointed on the designated target using the gun sight in coordination with the trainer and fires the gun when ordered. If manning a twin or quad mount which would require gun director control, he should switch first the control selector to manual; start the elevating power and firing circuit motors; and, when the gun and the gun director are matched, he would then switch the control selector to automatic. He takes station to the left seat of the gun.

c) Trainer - he operates the hand wheel to move the gun to the left or right and keep it trained in the direction of the designated target using the gun sight in coordination with the pointer. If manning a twin or quad mount which would require gun director control, he should switch first the control selector to manual; start the training power motor; and, when the gun and the gun director are matched, he would then switch the control selector to automatic. He takes station to the right seat of the gun.

d. Second Loader(s) or Ammunition Passer(s) - he normally stands by to take a clip of ammunition and prepares to pass it to the First Loader(s), when directed and to draw ammunitions continuously unless otherwise an order is issued to CHECK or CEASE FIRING. He takes station behind the gun mount where he can easily pass the ammunition clips to the First Loader(s).

e) First Loader(s) - he normally stands by for the order to load, when he would retract the hand operating lever, receive ammunition clips from the Second Loader(s) and load them to the feeders; and, for the order to standby, when he would replace the hand operating lever in forward position and set the firing selector to auto or single fire keeping the feeders filled with ammunitions unless orders are issued to cease or check firing, when he would set the firing selector back to "safe." He should also see to it that as soon as he takes station, the firing selector is switched first to "safe;" the top cover plate and side door of the gun are closed, latched and fully locked; the feeder firing stop lever is on the red arrow; and, the recoil indicator is set at number 6. If manning a twin or quad mount which would require gun director control, he should start first the cooling pump motors. He takes station to right side of the gun or in case of twin or quad mounts, they are stationed on the sides of the gun.

f) Gun Director Pointer - he is normally designated for twin or quad mounted guns equipped with Gun Directors Mark 51, charged with operating the gun director, tracking the designated target once switched to automatic control and firing the gun through the director firing key, when ordered.

g) Gun Director Range Setter - he is normally designated for twin or quad mounted guns equipped with Gun Directors Mark 51, charged with calculating target range and adjusting range setting at the gun director.

c. **20 Millimeter Anti-Aircraft (20MM AA) Gun**

The 20MM AA gun is a single or twin barrel, pedestal mounted, automatic firing, magazine-fed gun designed for action against low-flying aerial torpedo attack aircraft but

can also be used against surface targets. It is air-cooled and blow-back operated wherein the barrel does not recoil but the breechblock is never locked and in constant motion at the instant the round is fired.. The force of counter-recoil is being checked by the explosion of the next round. The gun maybe provided with a manual gun sight or the Mk 14 electrically operated telescopic gun sight to aid the gunner in hitting the target. The magazine is a cylindrical drum containing 60 rounds of ammunition which is placed on constant tension . The gun can be fired electrically through a solenoid switch or manually by means of a trigger mechanism at a rate of 450 rounds per minute. The mount is provided with a cocking devise (a wire rope or bar), an empty cartridge bag, a bracket that supports the shields, cradle spring and cradle. The following are other data about the gun:

Weight of the gun	- 141 lbs
Muzzle velocity	- 2,725 ft/sec
Rifling	- right-hand twist
Number of grooves	- 9
Maximum range (45° elev)	- 4,000 yards
Effective range (horiz)	- 2,000 yards
Effective range (vert)	- 1,200 yards

The 20MM AA gun is manned and operated by a gun crew composed of a minimum of 3 personnel (single barrel gun) and a maximum of six (6) personnel (twin barrel gun). These personnel with their duties indicated are as follows:

a) Gun Captain - if designated, he is in charge of gun crew directing the operation of the gun and is provided with sound-powered telephone (SPT) to communicate and take orders directly from the Gunnery Control Officer. He takes station to a position behind and to the right of the gun where he can best supervise the crew.

b) Gunner - he operates the gun by tripping the magazine catch lever and cocking it before it is loaded, seeing to it that the trigger safety catch is placed first to SAFE then setting it to FIRE when loaded and order is given to fire the gun. He takes station behind the gun and normally puts on shoulder straps. If there is no Gun Captain designated, he acts as such and shall don SPT for communications with the Gunnery Control Officer.

c) Second Loader - he draws a loaded magazine from the ready service locker seeing to it that it is properly tensioned and holds the same ready for loading after the First Loader has removed an empty magazine from the gun. He normally assists the Gunner in cocking the gun and adjusting the shoulder strap correctly.

d) First Loader - he looks through the bore from the muzzle of the gun to see that it is clear and reports "Bore Clear." He then draws a loaded magazine from the ready service locker seeing to it that it is properly tensioned and holds the same ready for loading when ordered.