

The Navy began the war with one of the most effective medium-range amphibious patrol bombers, the Consolidated PBY. Designed to replace patrol bombers of the early 1930s, the PBY first flew in 1935. Production lasted through the war and eventually totaled more than three thousand aircraft. The PBY was used for reconnaissance, attacks against surface ships and submarines, and rescue operations.

The PBY was supplemented by nonamphibious models. Because the Navy had been restricted from developing its own land-based planes, extensive use was made of the Army's Consolidated B-24. In Navy service, it was designated PB4Y. These long-ranged planes were used for patrol, photoreconnaissance, and bombing missions. They provided vital intelligence for amphibious operations. On these missions, Navy planes typically took photographs while Army B-24s provided escort, shooting down Japanese planes that threatened the flight.

The PB4Y was also used in the Atlantic, where it was aided in the fight against the U-boats by the Lockheed PV-1, a patrol bomber developed from a commercial aircraft. The British were the first to see its value, and the Americans adopted it soon afterward. Smaller and more agile than the PB4Y, the PV-1 sank numerous U-boats. Combined across all types, the Navy's land-based planes sank or assisted in sinking forty-eight Axis submarines in the Atlantic and European theatres.

## C. WEAPON SYSTEMS

### 1. Gunnery

Just as the battleship was considered the preeminent ship type, guns were accorded the most emphasis in doctrine and training. But the emphasis was not limited to surface gunnery. Antiaircraft gunnery received significant attention, particularly in the years immediately before 1941, when exercises revealed unexpected flaws in its effectiveness.

*Surface.* The Navy's surface gunnery capabilities were outstanding. Guns were the most visible element of the system, but behind them were sophisticated analog computers, advanced directors and radars, and new heavyweight shell designed to enhance their destructive power. These components, when coupled with the human elements of the system—spotters, fire-control men, turret crews, and gunnery officers—combined to make the Navy's surface gunnery among the most potent in the world.

The heart of the Navy's fire control systems was an analog computer, a rangekeeper. The earliest versions were developed before American entry into World War I. In those years, increasing battle ranges necessitated the introduction of computing mechanisms to predict the motion of the target.