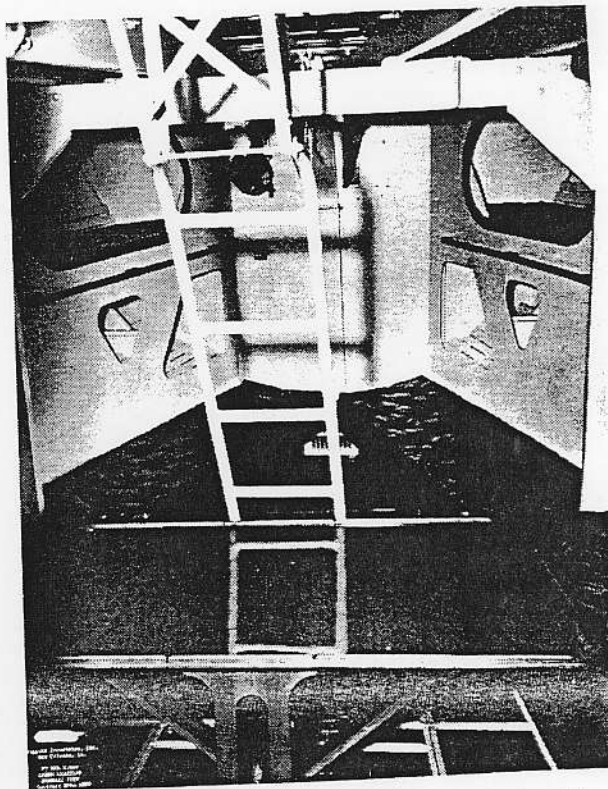
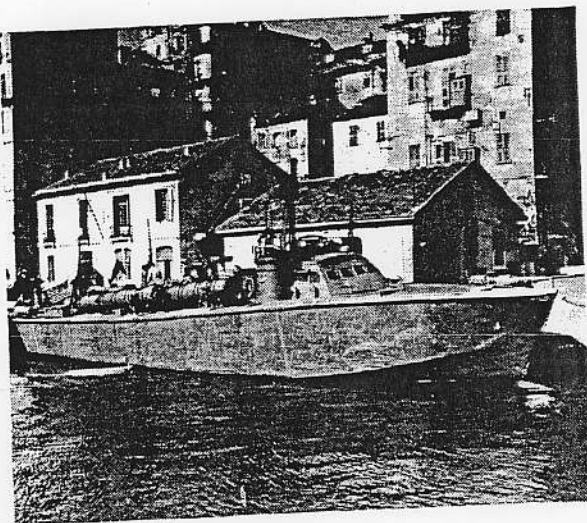


Below decks the crew's quarters was small and cramped. In a v-shaped compartment about 16 feet long were berths for eight men. The crew's toilet was located on the starboard side and the galley, with hot plate, sink, and refrigerator, was located to port. A folding mess table was provided in the center near the ladder leading to the forward hatch. Below the chartroom was the gun locker and berths for the officers, a desk and a chair. A door opened aft to the officers' head which was located between two 800 gallon gasoline tanks. Four 30 gallon potable water tanks were located in the bilges below the crew's quarters and ward room.

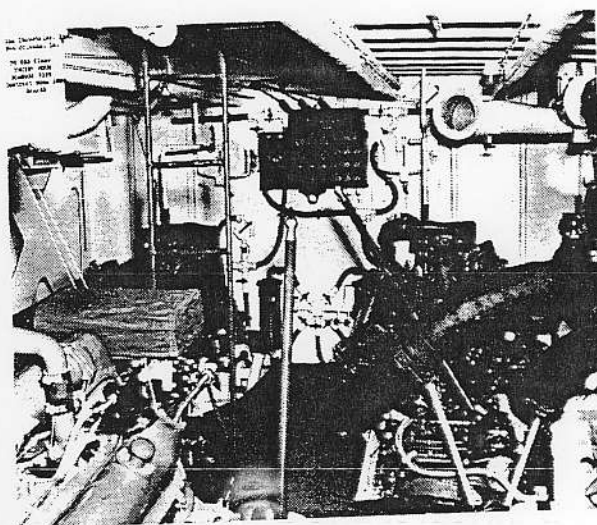
The roomy engine room and lazarette occupied fully half the length of the boat. The center engine was located aft of the two wing engines leaving plenty of room for maintenance. A work bench, two battery boxes, auxiliary generator, heater and air compressor were located alongside the center engine. Engine exhaust pipes led to mufflers at the sides of the boat at the waterline. Two 700 gallon fuel tanks were located in the engine room. The lazarette contained the steering assembly and a roomy stowage area. All three engines drove the propellers directly, with no v-drive, and rudders were provided aft of the two wing propellers.



Crew's quarters of Higgins boat looking forward. Note upper bunks.



A Higgins boat at Corsica in 1944.



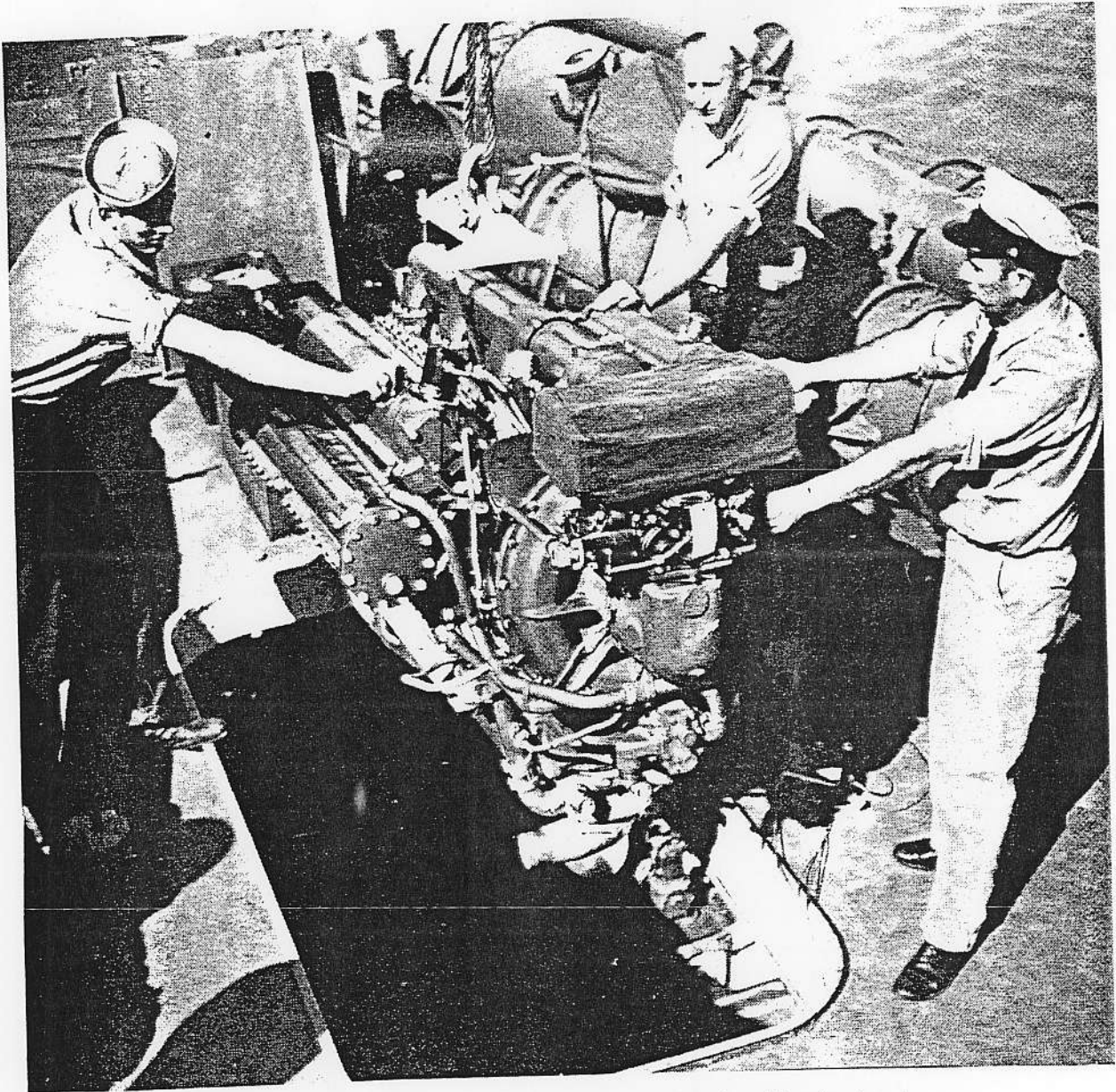
Engine room of PT 625 class Higgins boat looks crowded but was comparatively roomy. Center engine is in lower left of picture.

## COMMUNICATIONS

Many methods were used by the PT's for communications. Flashing light signals were sent by searchlight during the day or by blinker tube at night, and a multipurpose light was used both night and day. The method used depended upon the particular circumstances at the moment. Semaphore was always used where practicable for reasons of security. Recognition signals were sometimes made by smoke bombs or flares, but flashing light was preferred.

From the beginning PT's were equipped with a TCS model radio for communications with base or with each other. This had a 40 watt output and a range of 1.5 to 12.0 megacycles with a 20 foot whip type vertical antenna. Later a VHF radio was added to give greater security. Its transmission was limited to short distances.

Because the boats were small, internal communications were simple. Sound power phones were used in relaying orders from the bridge to the engine room, fantail or torpedo tube stations. Another means of communications was the use of a buzzer between



Replacing a 4M-2500 Packard marine engine in a Higgins boat.



the bridge and engine room. This was most frequently used for standard orders such as stand by to shift clutches, secure from shifting clutches, start engines, secure engines, etc. A voice tube was used from the bridge to the charthouse.

## ENGINES

With the exception of a few experimental pre-war boats which used the 900 h.p. Hall-Scott, 1800 h.p. Allison, or 1200 h.p. Vimalert engine, all American and most British boats used the Packard engine.

This very reliable engine was a development of the famous 1925 Liberty aircraft engine which was capable of 750 h.p. It was later converted for marine use by Gar Wood for use in his racing boats. In cooperation with the Elco Yacht Works, the Packard Co. perfected an engine especially for PT use. During the war, horsepower was increased from 1200 to 1350, and finally to 1500 with no increase in weight.

The V-12 supercharged Packard Marine Engine 4M-2500 weighed only 2950 pounds. It was rated at 1350 h.p. at 2400 rpm and 41.2 inches of mercury manifold pressure. At this top speed, 474 gallons of 100 octane gasoline was consumed per hour by the three engines. With the maximum sustained speed of 2000 rpm the three engines used 292 gallons which gave the boat a radius of 259 miles at 35 knots.

The Packard engine was one of the most reliable items of PT equipment. Changing of engines for overhaul was prescribed after 600 hours of use, but in combat conditions spare engines were not always available. Many engines gave satisfactory performance after more than 1200 hours. Sometimes boats were hit in combat and returned to base with several feet of water in the engine room, the engines almost submerged but still running.

## DOCKING CHARACTERISTICS AND TORQUE

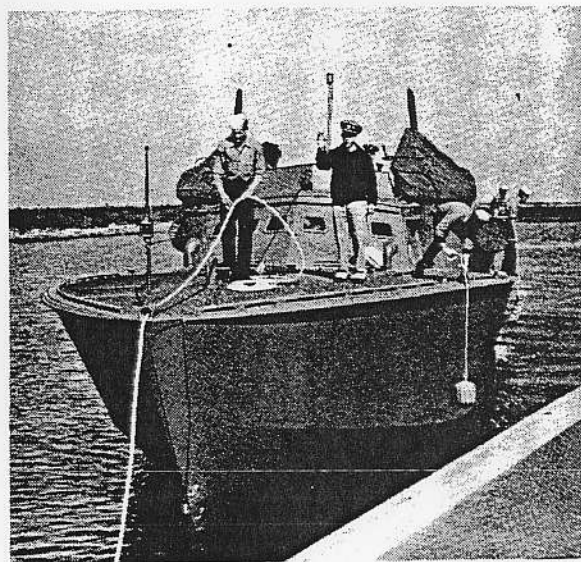
The PT boat had three right-hand propellers and two or three propellers

located in the slipstream. At slow speeds she could turn in her own length with one engine ahead, one astern and the rudder hard over. Propeller torque was very noticeable at slow speeds; therefore with the port engine ahead the boat would go straight ahead, and would back straight using only the port engine. On a windy day the boat would tend to back into the wind. The PT's were light enough to be hauled in by hand once the dock was close enough to get a line over.

To compensate for the effects of torque at slow speeds it was necessary to give the helm about 3 to 4 degrees of right rudder. As the boat increased speed, she began to rise up and plane on top of the water and torque decreased until at 1,500 rpm it was not noticeable. But as the engines reached 2,000 rpm, torque would tend to throw the stern to port and 2 to 3 degrees of left rudder was necessary to compensate.

## CHARACTERISTICS OF THE PT BOAT AT SEA

The PT boat represented great advance in providing speed with seaworthiness, but special handling was required in heavy seas. In waves up to 4 feet, a PT boat could make



Higgins PT coming in for a landing. Bumpers made of rope were held in position to prevent boat from rubbing on dock.