

Deck Layout and Onboard Facilities for Trawlers, Purse Seiners and Longliners

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The design, construction and operation of fishing vessels deserve the most important attention. The deck layouts and onboard facilities of different types of fishing vessels namely Trawlers, Purse Seiners and Longliners are described below:

For the specific fishing gear operation on board a vessel, requires special facilities for the success of the operation and for the capture of target species. It is necessary to carefully choose only those design features and construction practices which are consistent with modern trends and requirements.

A trawler as a specific boat type is equipped to tow a wide mouthed net through the water in such a way as to herd any fish it encounters into the path of the main bag of netting and then into the collecting area known as the cod end.

Because of this special net towing function, trawlers have different design requirement. The position from which the net is towed, the method of hauling the net and handling of the cod end with its catch, dictate the deck layout and the mechanical equipments needed. Sophisticated equipments such as split hydraulic winches, hydraulic crane arms for power blocks are included in the layouts of trawlers.

Deck Layout of a Stern Trawler (Ref Fig.)

The vessel is single decked with transom stern. There is a wide working deck aft with wheel house and crew accommodation. The engine room is usually forward beneath the deck. The fish hold is situated after the working deck. The winch is situated abaft. Gallows are situated on each side of the stern.

Deck Equipments

The important deck equipments are pullys, Derrick, Bollards, trawl winch, net drum, guide roller, trawl, Gallows and Gallow blocks.

Pullys

A pully is a small iron wheel with groove around its circumference in which a rope can be passed. It is used for lowering and raising the weight from the vessel to the shore and shore to vessel. It revolves in an axis which is supported by a frame called block. If the block is fixed, the pully is said to be a fixed pully and if it is movable it is called movable pully.

Derrick

It is a form of a crane, consisting of a long boom, the one end is free and the other end rests with a fixed mast. At the free end of the boom a block is fixed, through which a rope is passed for lifting the weight. The derrick can move from one direction to the other.

Trawl winch

The trawl winch has two drums to accommodate the warp of the trawl net, to release the warp at the time of shooting and heave the net. The trawl winch operates by mechanical or hydraulic power. Usually by its drum arrangement, the winch drums are either parallel or split. By speed, the speed of the winch is operated either by slow speed or high speed.

Net Drum Winch

In some trawlers a net drum winch is provided. It either operates by mechanical power or by hydraulic power.

Try Net Winch

The try net winch either operates by mechanical power or by hydraulic power.

Out Rigger Trawling

In stern trawling only one net can be operated, but in out-rigger trawling two trawl nets can be operated at the same time. Outrigger trawling is done mostly for the shrimp fishing.

Vessel layout of Outrigger Trawling

The wheel house is forward with the engine room beneath. The fish hold and gear stores will be in the midship. Two outrigger booms made of iron and derricks are provided. The booms project outside the main mast.

Layout of Purse Seiner

Purse Seine:

This is an encircling type of gear. Pelagic shoals like sardine, mackerel, Tuna etc. are caught by the purse seine. The purse seine is a long wall like net. It consists of a body and bunt or bag. The purse seine has a line attached to its upper edge called fload line. It carries a number of floats. There is a sinker line at the lower edge of the net carrying sinkers. Rings known as purse rings are attached to the sinker line by means of short bridles. A purse line running through the purse rings is used for closing the bottom of the seine after encircling of the shoal is completed.

Vessel and Deck Arrangement

The size of a purse seiner ranges from 10 - 250 tons but normally it is less than 100 tons. In order to keep good maneuver, the length of the vessel should not

be long. In fishing operation the stability of the vessel is an important factor because the purse-line is hauled in from one side for heaving the net. Therefore, the width of the deck should be as large as possible. A vessel with a small free board is preferred for better and easy operation of the net. Purse seiners are more or less similar to stern trawlers with a large clear aft deck with fish hold below. The wheel house is forward with some crew accommodation and the engine room is below. The purse winch is located longitudinally toward the port side. A locking arrangement is provided on the inner side of the gunwale to keep the gallow in the upright position during hauling of the net. The winch is driven either hydraulically or mechanically. The mast is abaft of the wheel house from which a boom is hung supporting the power block for hauling the net. Another small boom is also provided for handling the purse rings.

Purse Winch

The purse winch is smaller to the trawl winch, consisting of two winding drums which are mounted on a main shaft with the clutch and break. The purse lines are held on the winding drum. Two heaving drums are directly mounted one on either end of the shaft. The power for working the winch is obtained from a mechanical source or hydraulic source or electrical source.

Purse Davit

Purse davit is a strong 'T' shaped structure supporting two davit blocks to provide proper run of the purse line to the winch. It is mounted on the main deck on the starboard side in a line with the Purse winch. It is more important to mount the davits on the deck as far as possible in forward and with its top edge leaning out of the vessel.

Net hauler/Triplex Roller

It is used for hauling the net after the completion of the pursing. Usually it consists of vertically mounted three rollers. The three rollers/drums rotate in

opposite direction to each other. The power is given to these rollers by hydraulic system.

Power Block/Pully Block

Power block is a large 'V' shaped sheave mounted on a long boom. The power of the power block depends on the height at which it is mounted, the friction between surface of the sheave and shape of the groove of the sheave. Therefore, power blocks are mounted in a very high position from the main deck. Hydraulic power is used for driving the power block. The introduction of power block was a major step in increasing the efficiency of purse seine because it helps to reduce the manual power.

Deck Layout of Longline Fishing

Long line fishing in the Oceanic waters is for the capture of Tuna, Sharks, and the bill fishes. The long line consists of a main line, sometimes of considerable length, to which snoods are fixed at regular intervals. These lines are kept on the surface or at certain depth by means of regularly spaced floats.

Deck Layout of Tuna Longline

Suitable machinery are required in the deck for a tuna long line operation to shoot and haul up the lines and proper storage place for keeping the fishing gear. The most common and ideal vessel for Tuna longline fishing is with 200-400 gross tonnage class. A 250 gross tonnage with OAL of 37M; with 6.8m breadth and 3.4 m draft having 550 BHP is most suitable.

Machinery and Equipment

The main engine will have remote control from the wheel house, which is very essential to move the vessel at desired speed while hauling the tuna long line.

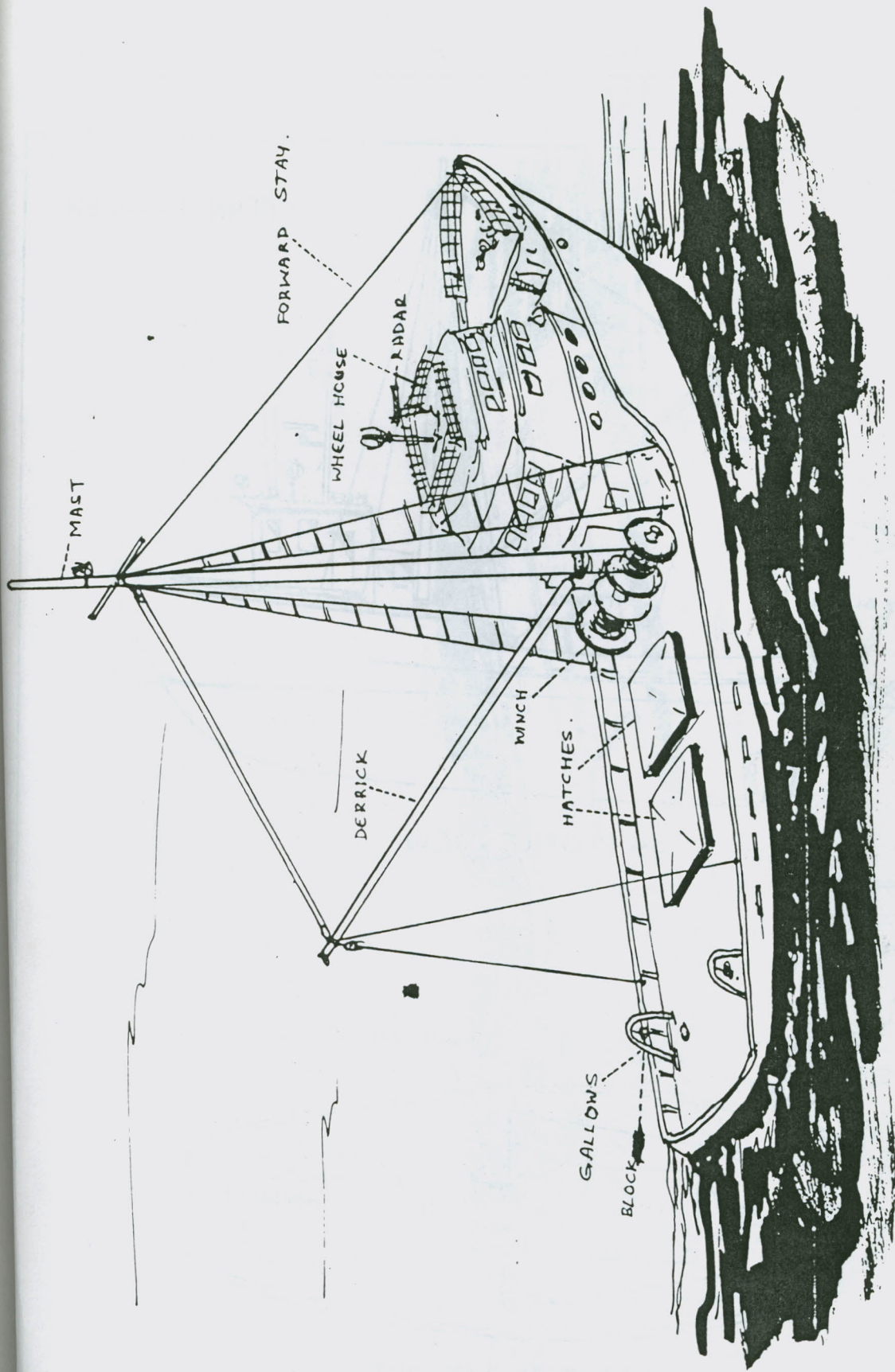


FIG:53 STERN TRAWLER

STERN TRAWLER

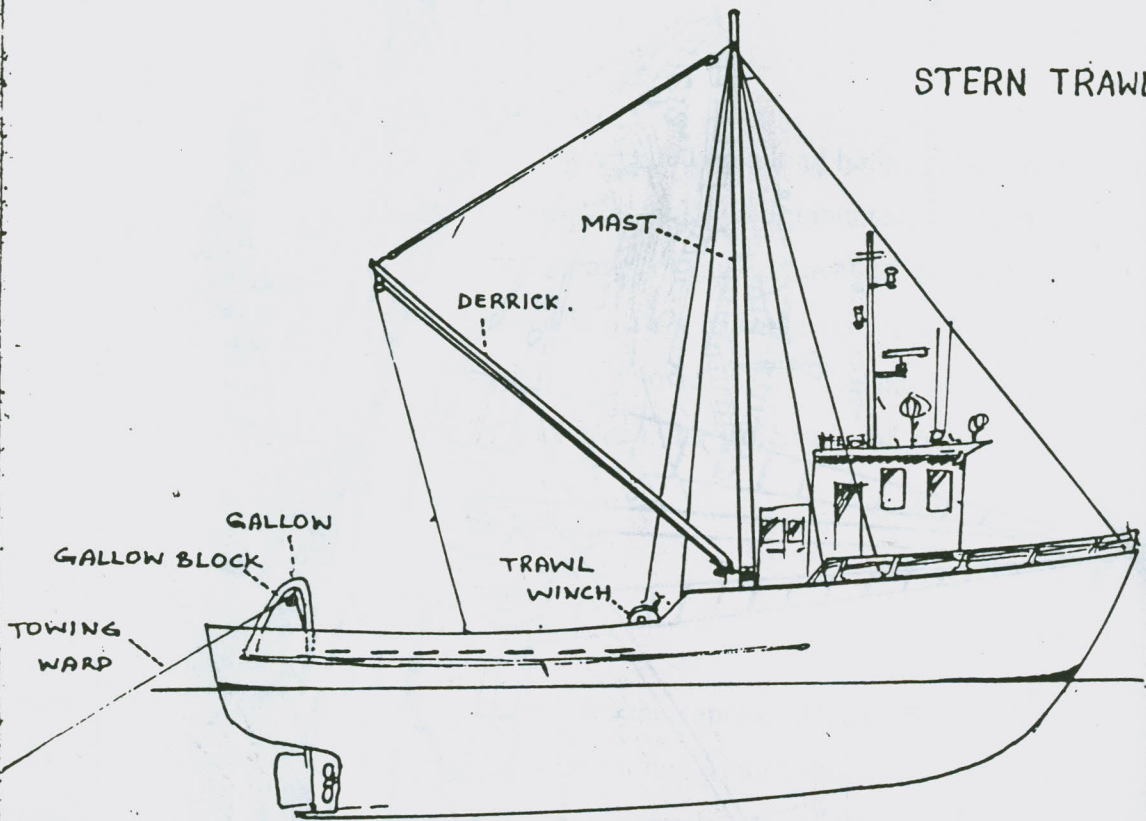


FIG:54 PROFILE VIEW

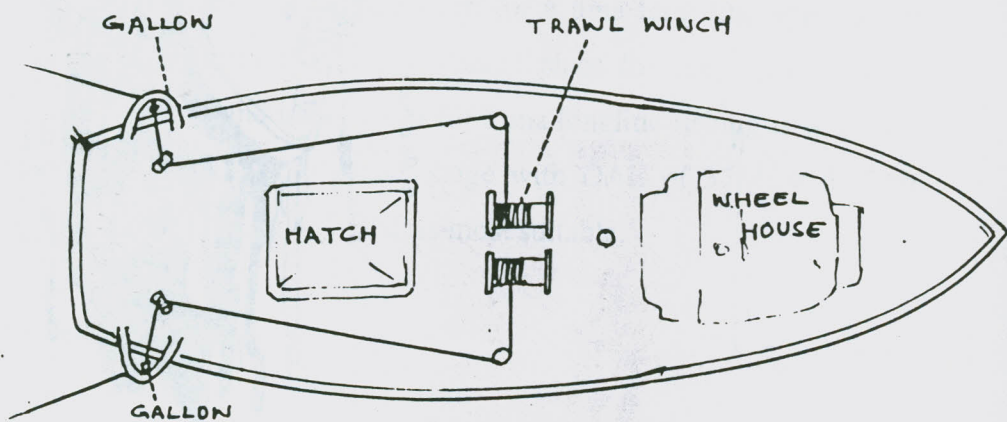


FIG:55-DECK LAY OUT

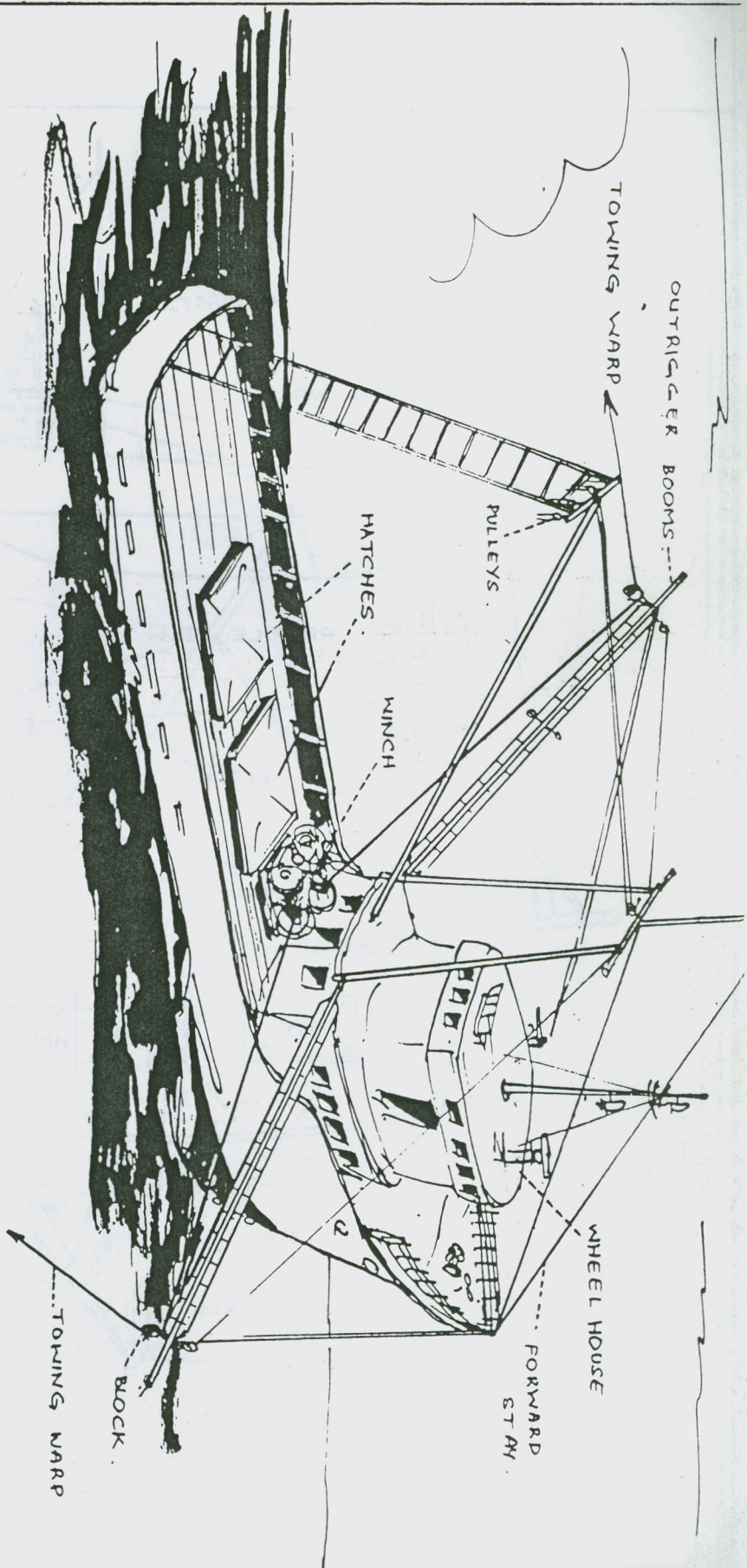


FIG: 56 OUTRIGGER

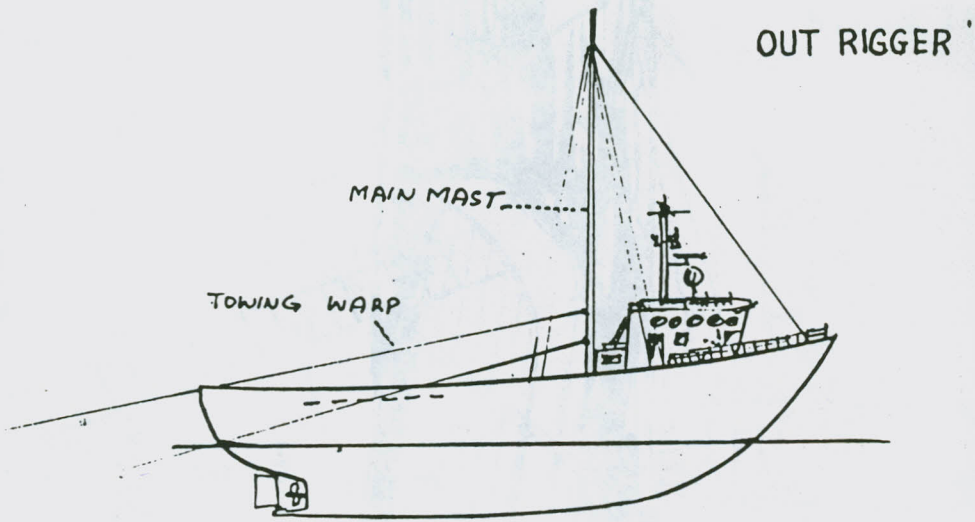


FIG: 57 PROFILE VIEW

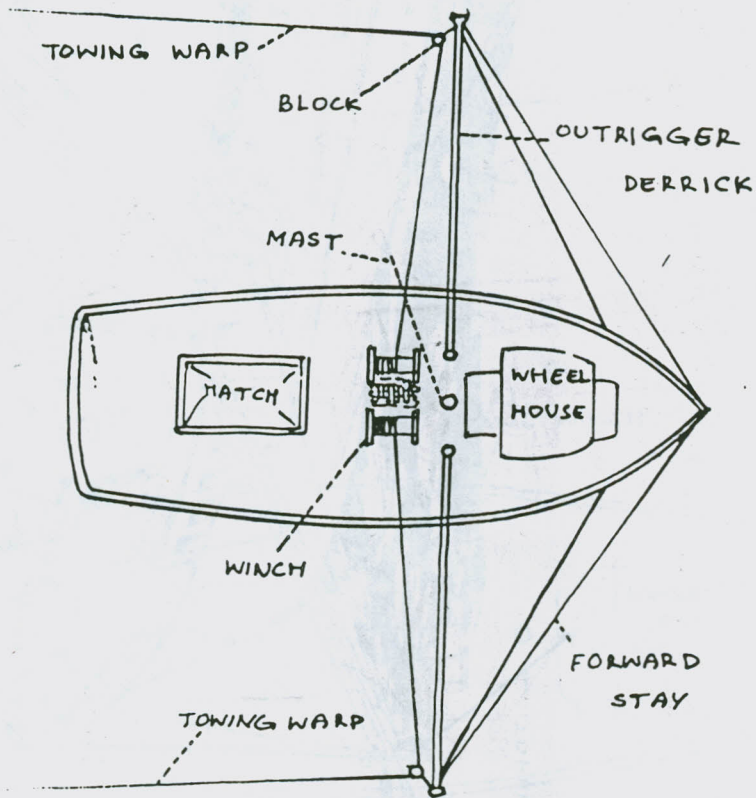


FIG: 58 DECK LAY OUT

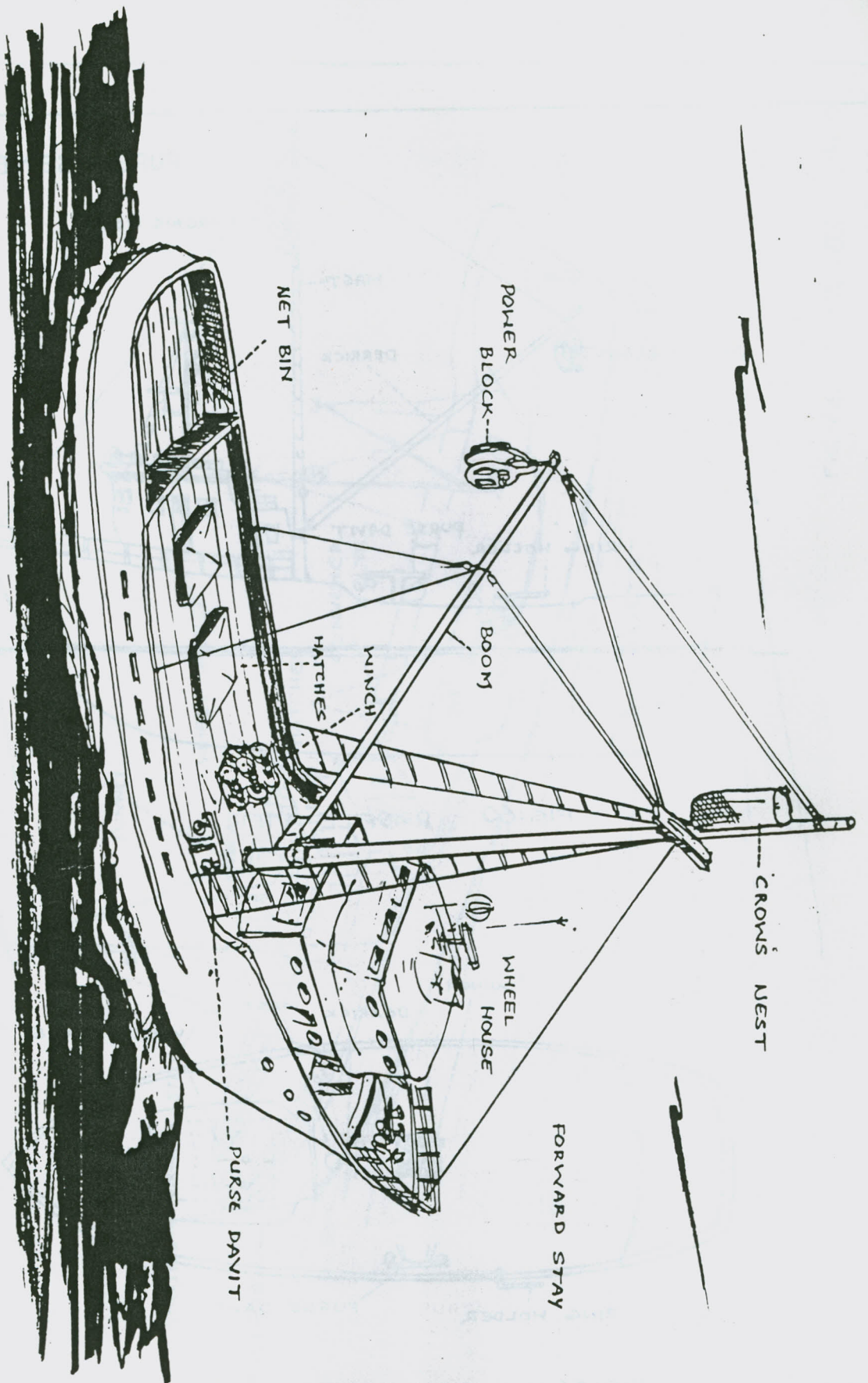


FIG: 59 PURSE SEINER

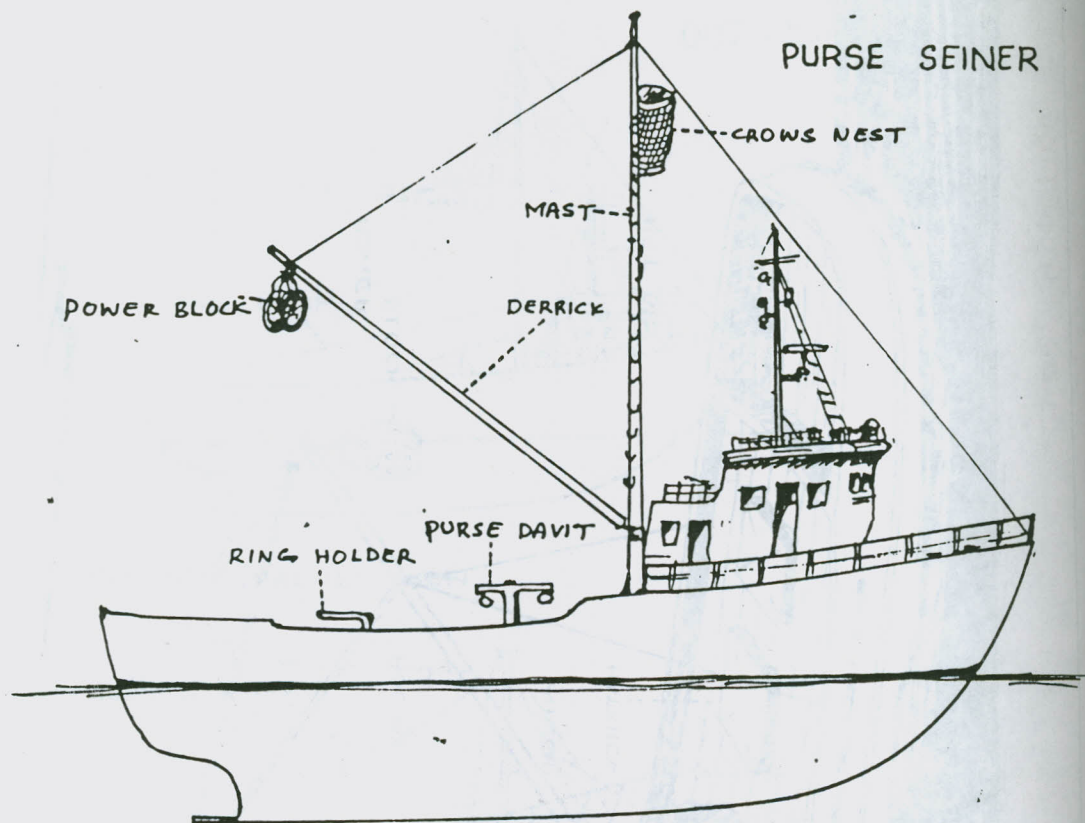


FIG:60 PROFILE VIEW

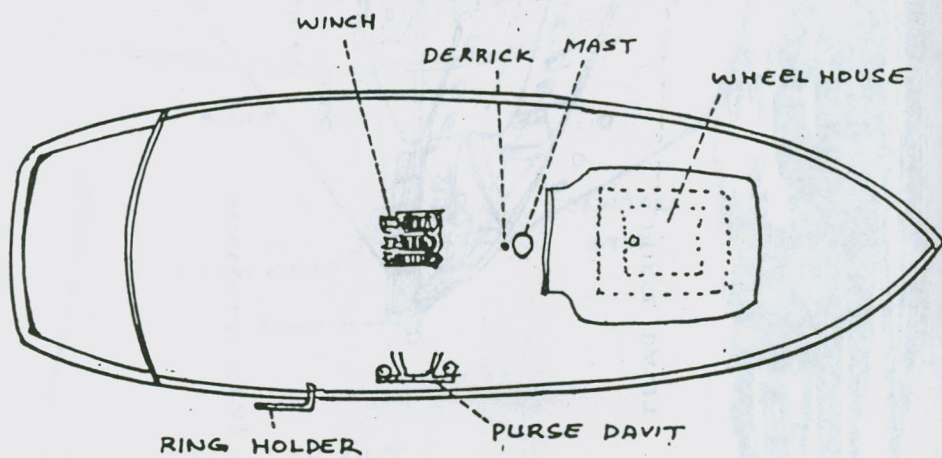


FIG:61 DECK LAY OUT

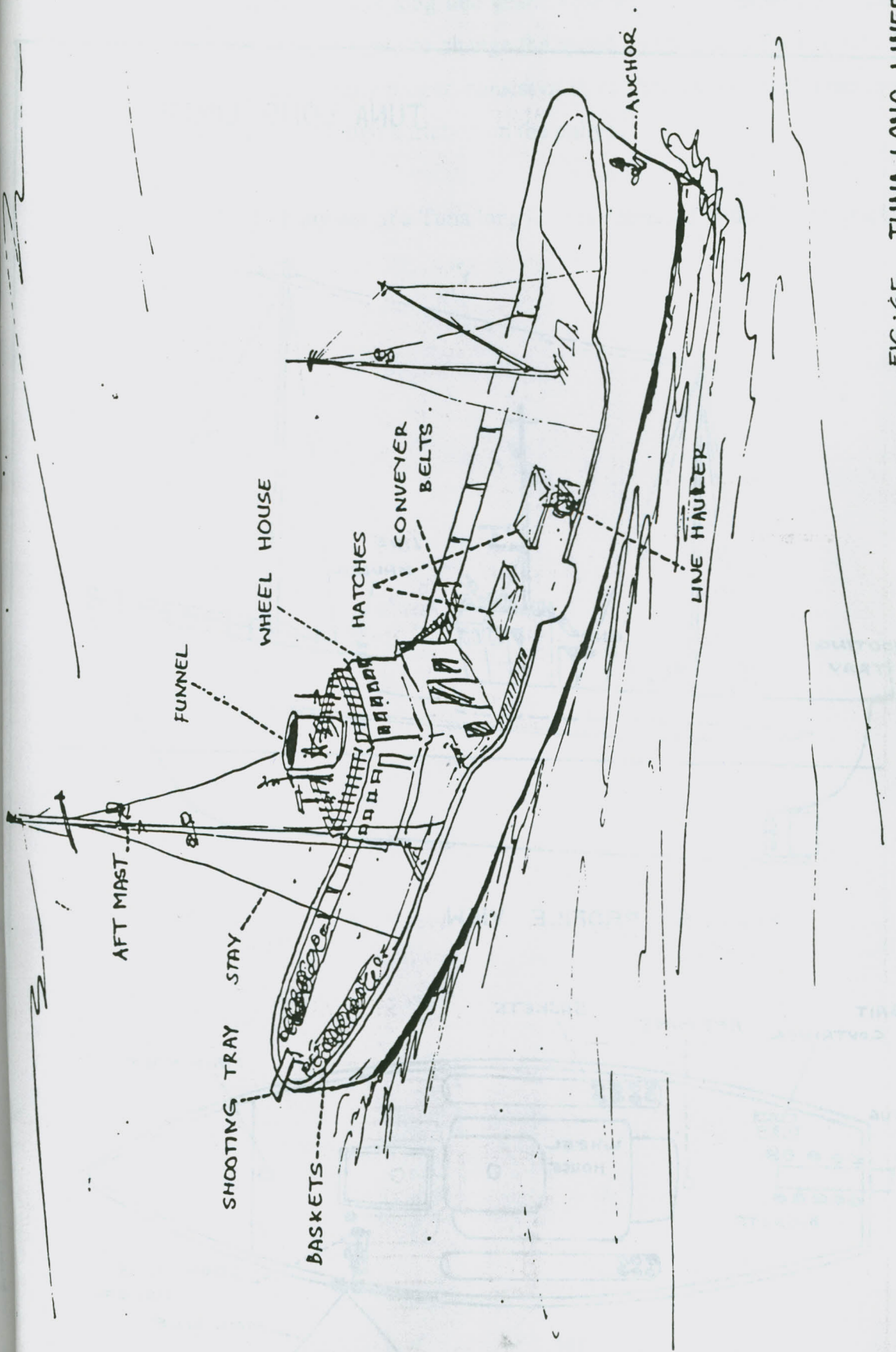


FIG:65 TUNA LONG LINER

TUNA LONG LINER

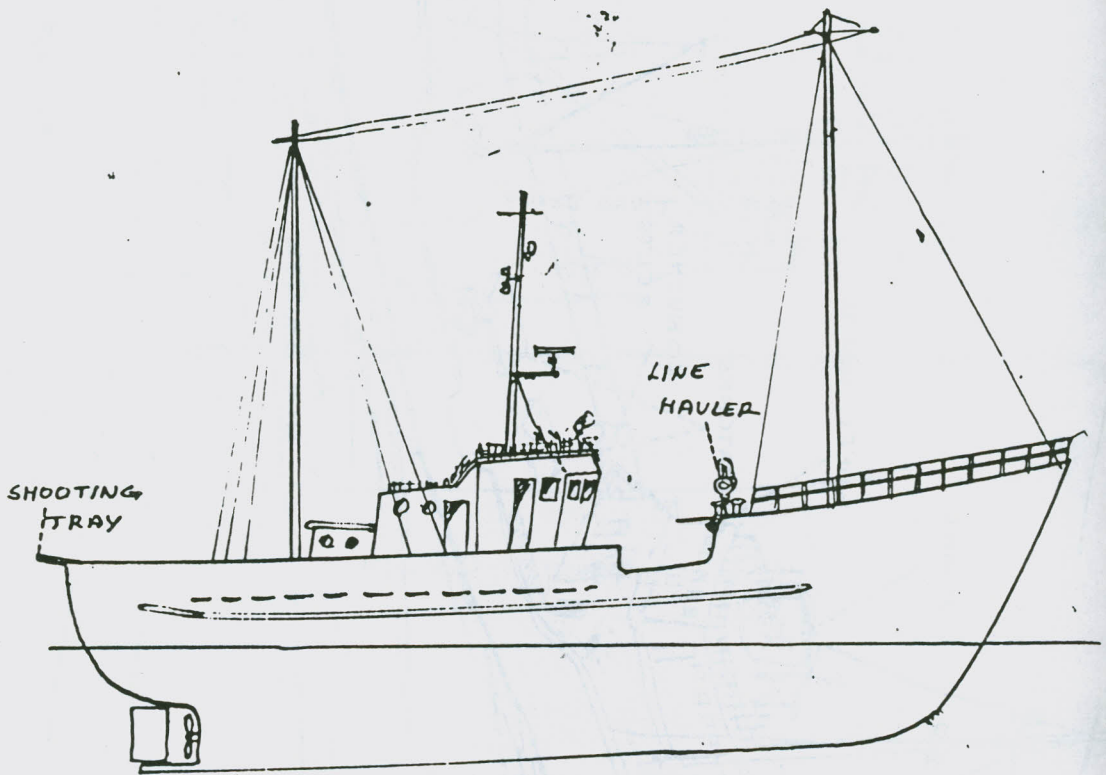


FIG: 66 PROFILE VIEW

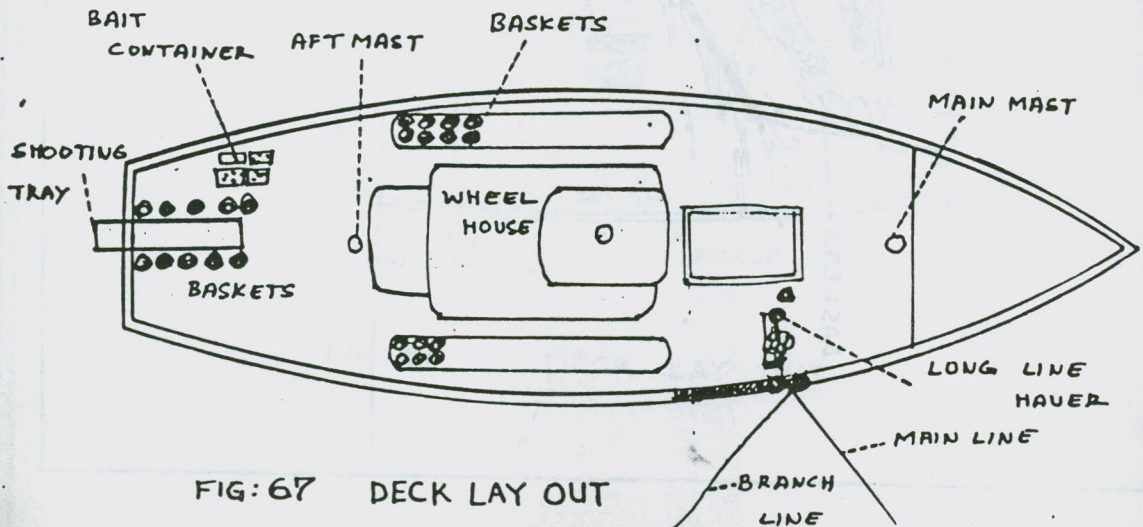


FIG: 67 DECK LAY OUT

Line Hauler

Mechanical Line hauler is the only deck equipment installed on board tuna long liners for hauling the long line gear. Line haulers has three parts, the driving electric motor, the gear to change the speed and a clutch for control. The top part, house the gurdy proper, consist of three sheaves by which lines are hauled mechanically through a friction on the pullys.

The deck lay out of a Tuna long liner is described in the figures enclosed.