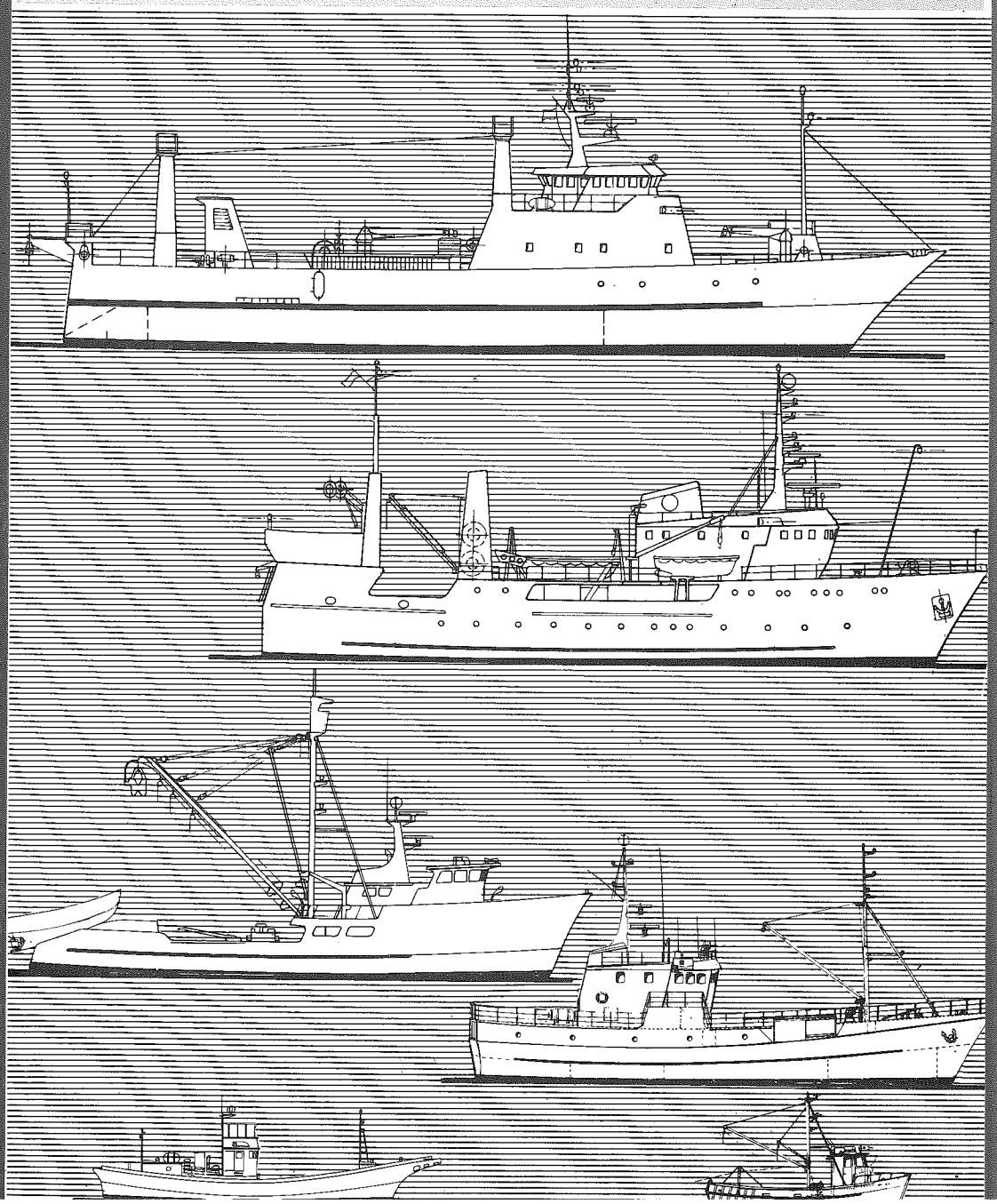
Definition and classification of fishery vessel types

FAO
FISHERIES
TECHNICAL
PAPER

267



FOOD
AND
AGRICULTURE
ORGANIZATION
OF THE
UNITED NATIONS

Definition and classification of fishery vessel types

compiled by
Fishery Information,
Data and Statistics Service
and
Fishing Technology Service
FAO Fisheries Department

FAO
FISHERIES
TECHNICAL
PAPER

267

FIDI/FIIT/T267

FOOD
AND
AGRICULTURE
ORGANIZATION
OF THE
UNITED NATIONS
Rome, 1985

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

M-41
ISBN 92-5-102318-2

PREPARATION OF THIS DOCUMENT

Preparation of this document was initiated at the Tenth Session of the Coordinating Working Party on Atlantic Fishery Statistics (Madrid, 22-29 July 1980, where it was recommended "that resources permitting, FAO should prepare a technical document containing descriptions and illustrations of fishing vessels types as a guide to the vessel type classification". In the same CWP Report it is also mentioned that two types of fishery fleet statistics may be considered:

(i) based on the structural characteristics of the vessels

(ii) based on the fishing gear used

The classification given in this document is based on "fishing gear" used in order to meet equally the needs of the users engaged in statistical studies as well as management of the fish resources. It must, however, be stressed that the fishing gear used only partly determines the characteristic features of a fishing vessel as there is a wide range of alternatives in size as well as in deck arrangement and layout of vessels using the same gear. For non-fishing vessels a classification scheme by the type of activity carried out, i.e., fishcarriers, training vessels etc., was adopted.

This document has been compiled in the Fisheries Department by the Fishery Information, Data and Statistics Service, with the close collaboration of the Fishing Technology Service and based on the paper by Dr W. Orszulok: "Definition and classification of fishery vessel categories"[1/]. It may further be revised and modified based on the comments received from fishery statisticians, fishery management and fishery surveillance experts.

1/ Orszulok, W., 1984. Definition and classification of fishery vessel categories. Paper presented to the Coordinating Working Party on Atlantic Fishery Statistics. Twelfth session. Copenhagen, Denmark, 25 July - 1 August 1984. Rome, FAO, CWP-12/85: 61 p. (mimeo)

Distribution:

FAO Fisheries Department
FAO Regional Fisheries Officers
CWP Members
Directors of Fisheries
Fisheries Policy (general)
Fishery Management
Fishery vessels and Engineering

For bibliographic purposes this document should be cited as follows:

FAO, 1985. Fishery Information, Data and Statistics Service and Fishing Technology Service (comps), Definition and classification of fishery vessel types. FAO Fish.Tech. Pap., (267):63 p.

ABSTRACT

This document provides definitions of fishing vessels, grouped by types, following the outlines recommended by Coordination Working Party on Atlantic Fishery Statistics (CWP). These definitions and classification are valid on a worldwide basis for both marine and inland fisheries. Brief descriptions, complemented by simple illustrations will provide to the users, including to non-specialists, sufficient information for proper identification and classification of all types of fishery vessels. The document is intended as a reference tool and is designed to meet the requirements of fisheries statisticians, economists, administrators, biologists, technologists, teachers, extension workers, etc.

CONTENTS

	Page
INTRODUCTION	1
DESCRIPTION OF THE MAJOR CATEGORIES OF VESSEL	3
FISHING VESSELS	3
1. TRAWLERS	3
1.1 Side trawlers	3
1.2 Stern trawlers	5
1.3 Wet-fish trawlers	7
1.4 Freezer trawlers	7
1.5 Factory trawlers	8
1.6 Outrigger trawlers	8
2. SEINERS	10
2.1 Purse seiners	10
2.1.1 North American type purse seiners	10
2.1.2 European type purse seiners	12
2.1.3 Tuna purse seiners	12
2.2 Seine netters	14
3. DREDGERS	15
4. LIFT NETTERS	16
5. GILL NETTERS	17
6. TRAP SETTERS	18
6.1 Pot vessels	18
7. LINERS	20
7.1 Handliners	20
7.2 Longliners	21
7.3 Tuna longliners	23
7.4 Pole and line vessels	24
7.4.1 Japanese type pole and line vessels	24
7.4.2 American type pole and line vessels	25
7.5 Trollers	25
8. VESSELS USING PUMPS FOR FISHING	27

Page

9. MULTIPURPOSE VESSELS 28

9.1 Trawler/Purse seiner 28

NON FISHING VESSELS 31

10. MOTHERSHIPS 31

10.1 Salted-fish motherships 31
10.2 Factory motherships 32
10.3 Motherships with catching vessels aboard 33
10.4 Motherships for two-boat purse seining 33

11. FISH CARRIERS 34

12. HOSPITAL SHIPS 34

13. FISHERY PROTECTION VESSELS 35

14. FISHERY RESEARCH VESSELS 36

15. FISHERY TRAINING VESSELS 37

APPENDIX 1 International Standard Statistical Classification of Fishery Vessels (ISSCFV) by Vessel Types 39

APPENDIX 2 Examples of fishery vessels - Technical drawings 41

APPENDIX 3 Approximate relation between gross tonnage number (GT) and length overall of fishery vessels 59

APPENDIX 4 Fishery vessel operation areas 61

SOURCES OF ILLUSTRATIONS 63

LIST OF FIGURES

		Page
Figure 1	Side trawler	4
Figure 2	Small stern trawler	5
Figure 3	Medium size stern trawler	6
Figure 4	Freezer trawler	7
Figure 5	Beam trawler	8
Figure 6	Outrigger trawler	9
Figure 7	North American type purse seiner	11
Figure 8	European type purse seiner	12
Figure 9	Tuna purse seiner	13
Figure 10	Seine netter	14
Figure 11	Dredger	15
Figure 12	Lift netter	16
Figure 13	Gill netter	17
Figure 14	Small pot fishing vessel	18
Figure 15	Large pot fishing vessel	19
Figure 16	Handliner	20
Figure 17	Small longliner	21
Figure 18	Large longliner	22
Figure 19	Tuna longliner	23
Figure 20	Japanese type pole and line vessel	24
Figure 21	American type pole and line vessel	25
Figure 22	Troller	26
Figure 23	Vessel using pump for fishing	27
Figure 24	Trawler-purse seiner	29
Figure 25	Trawler/seiner	30
Figure 26	Factory mothership	32
Figure 27	Mothership with catching vessels aboard	33
Figure 28	Fish carrier	34
Figure 29	Fishery protection vessel	35
Figure 30	Fishery Research vessel	36

INTRODUCTION

The purpose of this paper is to present classified descriptions and illustrations of fishery vessel types for the use of fishery administrators and the staff of statistical offices concerned with identification and classification of fishery vessels.

In compiling the present draft version of this document, the following has been considered as background material.

- Definition and Classification of Fishing Gear Categories[1/].
- "FISHSTAT FF" Fishery Fleet - number of vessels and total tonnage by size/GRT/and type[2/].
- International Standard Statistical Classification of Fishery Vessels/ISSCFV/by GRT Categories[3/].
- FAO Summary Classification of Fishing Vessels by Types[4/].
- International Standard Statistical Classification of Fishery Vessels/ISSCFV/by Vessel Types[5/].

The term "fishery vessels" used in this paper comprises mobile floating objects of any kind and size operating in freshwater, brackish water and marine areas and used for catching, transporting, landing, preserving and/or processing of fish, shellfish and other aquatic animals, (excluding whales) residues and plants. Also included are vessels performing other functions related to fisheries such as supplying, protecting, rendering assistance or conducting research or training.

The term "fishing vessel" is used to distinguish fishery vessels engaged in catching operations. The remaining fishery vessels are covered by the term "non-fishing vessels".

In accordance with generally accepted practice the category gear used for catching (or other function related to fisheries) fish or other aquatic organisms and employed by the vessel have been used as the basic criterion for the classification of fishery vessels.

In the descriptions of vessel types the following features, characteristic of fishery vessels, have been adopted for distinguishing between various types and classes:

- The general arrangement and deck lay-out.
- For identification of fishery vessels with the bridge or wheelhouse and the engine room located aft, amidships or forward.

1/ Nédélec, C., 1982 Definition and classification of fishing gear categories. FAO Fish.Tech.Pap., (222):51 p. Issued also in French and Spanish

2/ FAO Fisheries statistical form FISHTAT "FF" concerning fishery fleet

3/ Appendix 1, In FAO Fish.Circ./FAO Circ. Pêches/FAO Circ.Pesca, (731):177

4/ Appendix 2, In FAO Fish.Circ./FAO Circ.Pêches/FAO Circ.Pesca, (731):178

5/ Appendix 3, In FAO Fish.Circ./FAO Circ.Pêches/FAO Circ.Pesca, (731):179

- Fishing equipment - On some small vessels the fishing gear is often set and lifted entirely by hand. Medium sized and large fishing vessels are fitted with appropriate machinery and equipment: derricks, winches, net and line haulers, power blocks, net drums and other specialized gear.

- Methods of fish preservation and processing - The fish can be landed in the wet condition, chilled or frozen. If processing on board is provided, other fish products: e.g., fillets, cured fish, canned fish, fish oil, fish meal, can be landed. Freezing and processing require installation of special machinery on board: refrigerating plant, filleting machines, fish-meal factory, etc.

The size of the vessel, expressed in GT or length[1/] is used in fishery fleet statistics for subdividing vessel types into classes. This strictly statistical subdivision is in practical applications often replaced by a simplified form in which "large", "medium sized" and "small" vessels are distinguished. This above subdivision corresponds approximately to the area of operation of the vessel: large fishery vessels operate principally in open seas, medium sized vessels in the EEZ marine areas and small decked vessels are predominantly used in coastal and sheltered marine and brackish waters. Open boats and canoes which are launched from and landed on beaches, operate very close to the coast. In freshwater small vessels, boats and canoes are mainly used.

The International Convention on Tonnage Measurement of Ships, 1969, which came into force in 1982 shall apply to vessels over 24 m in length in the following categories:

(a) new ships;

(b) existing ships which undergo alterations or modifications which the Administration deems to be a substantial variation in their existing gross tonnage;

(c) existing ships if the owner so requests; and

(d) all existing ships, twelve years after the date on which the Convention comes into force, except that such ships, apart from those mentioned in (b) and (c) of this paragraph, shall retain their then existing tonnages for the purpose of the application to them of relevant requirements under other existing International Convention.

At present, the vessel statistics collected by FAO are classified by GRT classes, as approved by the Ninth Session of the Coordinating Working Party on Atlantic Fishery Statistics (Dartmouth, Canada, 17-23 August 1977). Although FAO will start collecting statistics by GT classes from 1986 onwords, for consistency it will continue to collect vessel statistics by GRT classes until such time as an adequate time series of vessel statistics by GT classes is built up.

A proposed international classification of fishery vessels by vessel types, resulting from the content of this paper, is drawn up in Appendix 1.

1/ GT and length are not proportionately related. A statistically derived curve showing the approximate relation between GT and overall length of fishery vessels is shown in Appendix 3 (from 24 to 100 m) and can be used as a guide to find approximate length for a given GT and vice versa

Illustrations accompanying the descriptions show in simplified form and in perspective the various types of vessels. Additional technical drawings of certain vessel types are included in Appendix 2. The scale of drawings and illustrations has been replaced by indication of approximate GT and/or length of the vessel.

A large number of fishery vessels operate throughout the world and many of them, using the same fishing gear or performing the same fishery function, differ (sometimes radically) in general arrangement and deck lay-out. From these various alternatives of each of the fishery vessel types the most representative ones have been selected for description and illustration.

DESCRIPTION OF THE MAJOR CATEGORIES OF VESSEL

FISHING VESSELS

1. TRAWLERS

These vessels use trawls as fishing gear and are provided with engines of sufficient power to tow the net at the appropriate trawling speed. They are fitted with trawl winches and equipment necessary to haul the net on board and lift the cod-end over the deck.

Depending on the area of operation and the trawl used, trawlers range in size from open boats with inboard motors up to large freezer and factory trawlers.

Bottom as well as midwater trawls can be used with only minor modifications of fishing equipment.

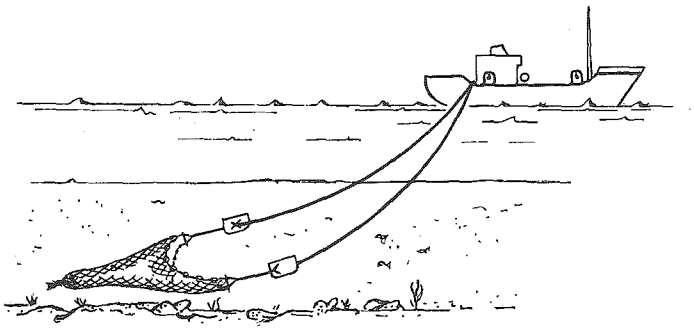
Pair (two-boat) trawling achieves the spread of the net by towing the warps between two trawlers of the same or reasonably similar traction power. Lay-out of a typical pair trawler is often similar to that of a side trawler, the larger vessels frequently having a net drum to handle the pair trawl which are larger than those of single (one-boat) trawlers of similar size.

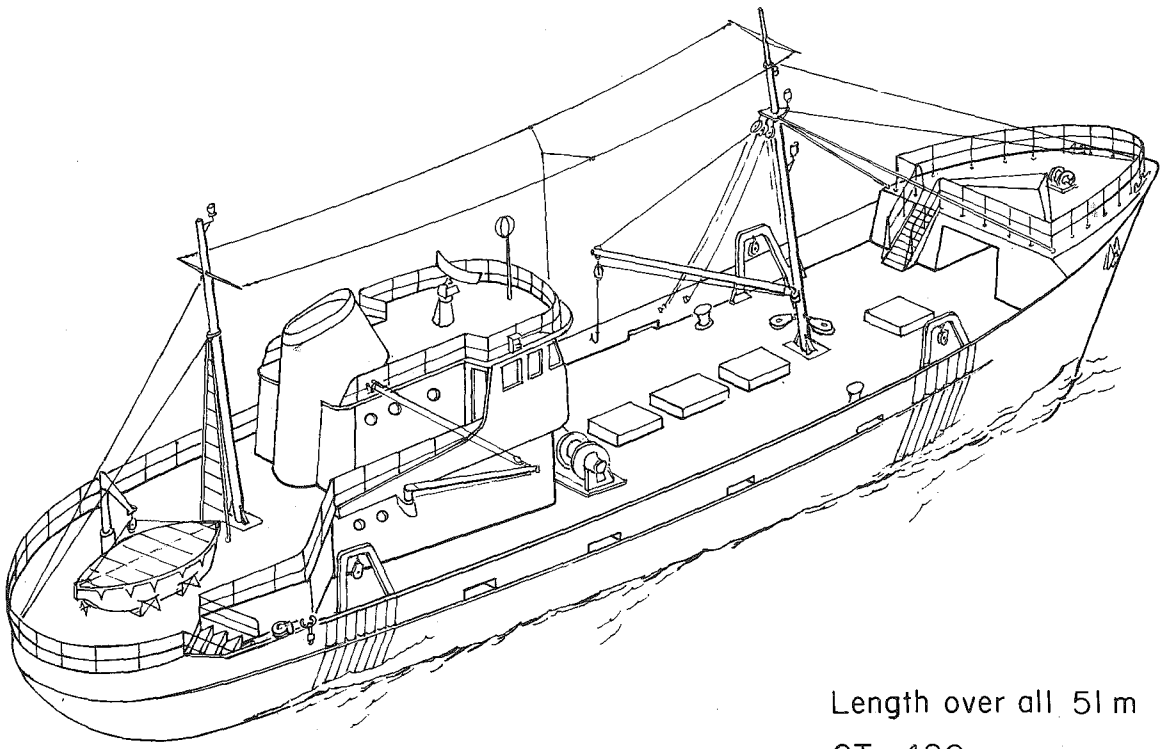
1.1 Side trawlers

On side trawlers the trawl is set over the side and the warps pass through blocks hanging from two gallows, one forward and one aft.

Usually the superstructure and the wheelhouse are placed aft, the fish hold is situated amidships and the trawl winch transversally at the front of the superstructure as shown on Figure 1.

Around the gallows the hull is strengthened against chafing of the otterboards. When the vessel is not trawling the otterboards are stowed between the gallows and the bulwark.





Length over all 51 m
GT 420

Figure 1 Side trawler

1.2 Stern trawlers

On these vessels the warps are led from the trawl winch through various lead blocks to the after deck and over the stern. Figure 2 shows one deck arrangement for a small stern trawler and Figure 3 a medium size stern trawler. Towing blocks on small vessels are attached to two stern gallows; on larger vessels to a gantry or similar fixed structure aft.

On stern trawlers the wheelhouse or bridge is usually situated in the forward part of the vessel.

Medium sized and large stern trawlers are often fitted with a stern ramp, on which the trawl is hauled onto the deck. On small vessels a stern roller is used to reduce friction when shooting and hauling up the trawl.

The trawl winch is placed transversally usually behind the wheelhouse. Split trawl winches are used on medium sized and large stern trawlers; they are then placed as far forward as possible to provide space for the trawl gear.

On small vessels the fish hold is situated amidships and on medium sized and large stern trawlers also in the forward part of the vessel.

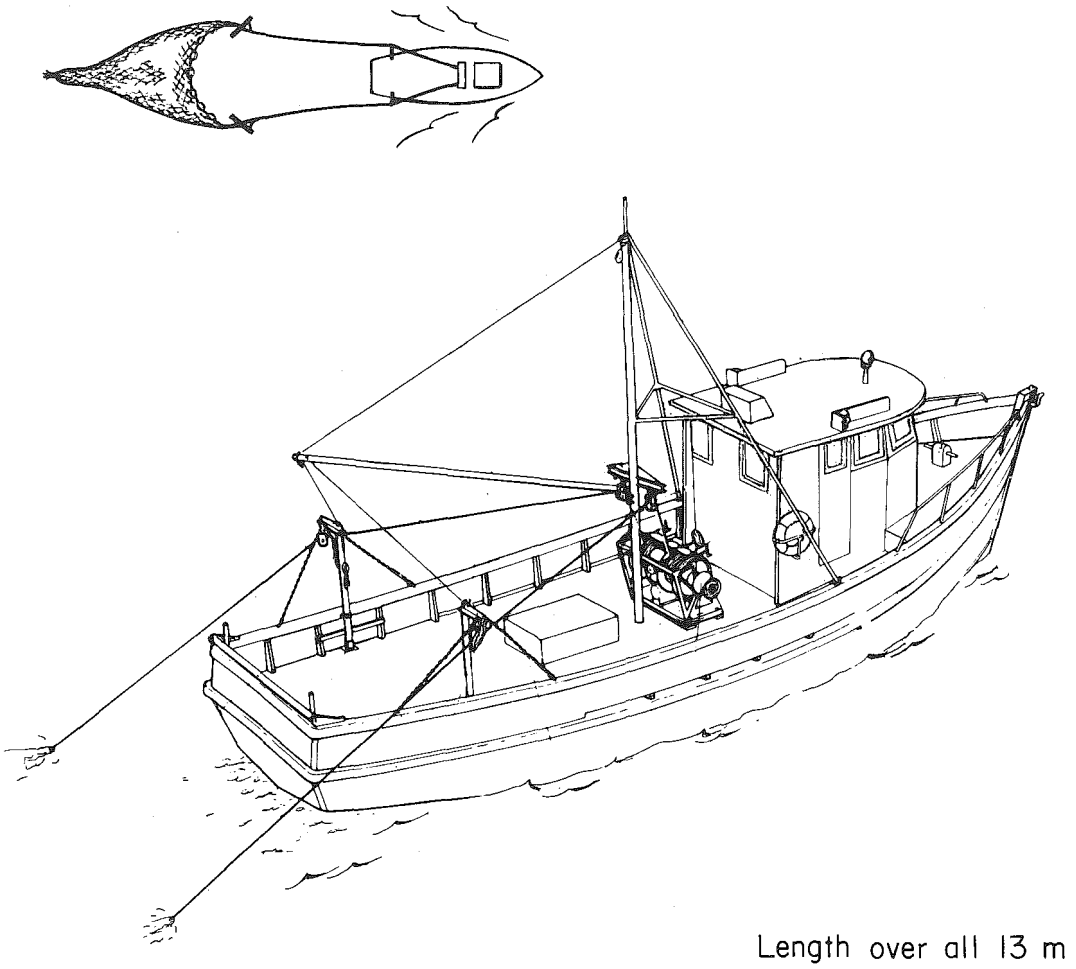
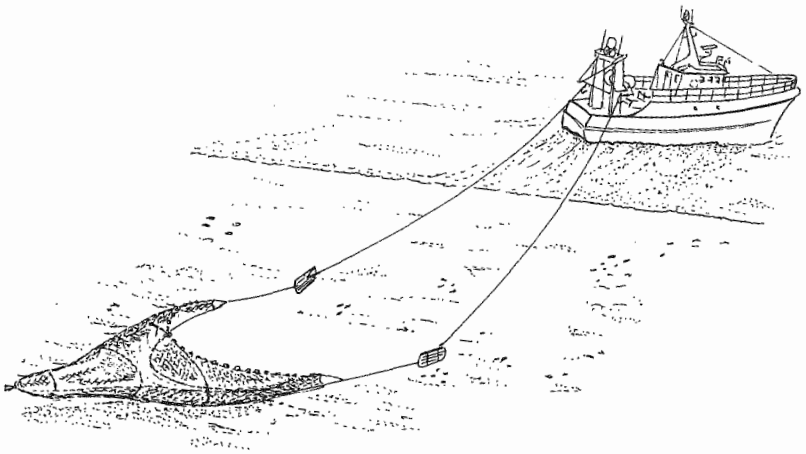


Figure 2 Small stern trawler



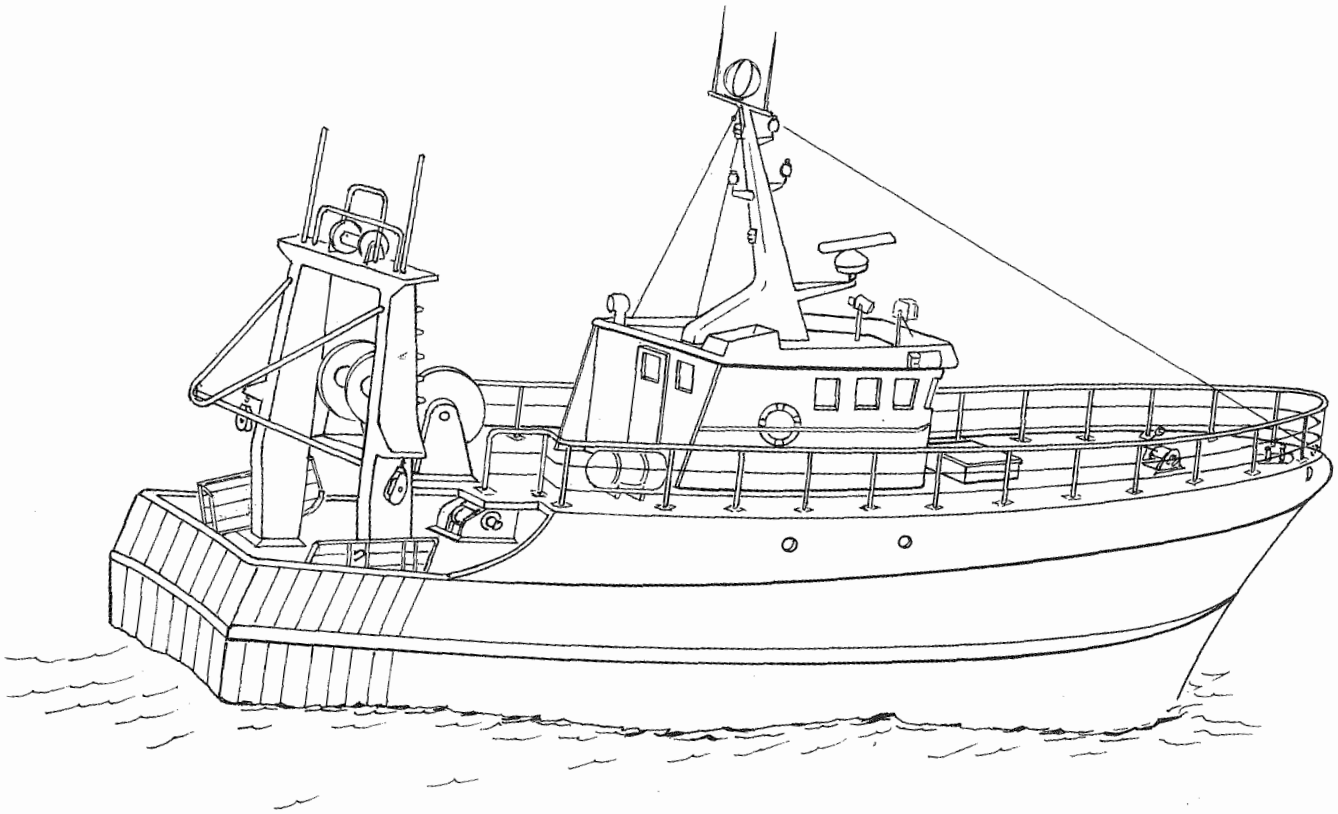


Figure 3 Medium size stern trawler

1.3 Wet-fish trawlers

This term is used for trawlers, on which the fish is kept in the hold in the fresh/"wet"/condition. Wet-fish trawlers therefore operate usually in areas not too far distant from the landing place.

The majority of small trawlers and some medium sized trawlers are not equipped with refrigerating plants but many of them have insulated fish holds and carry ice to preserve fish.

1.4 Freezer trawlers

These are trawlers on which the fish is preserved by freezing. The majority of trawlers operating on distant waters are freezer trawlers.

Freezer trawlers are outfitted with refrigerating plant and freezing equipment. The holds are insulated and refrigerated, an example of a freezer trawler is shown on Figure 4.

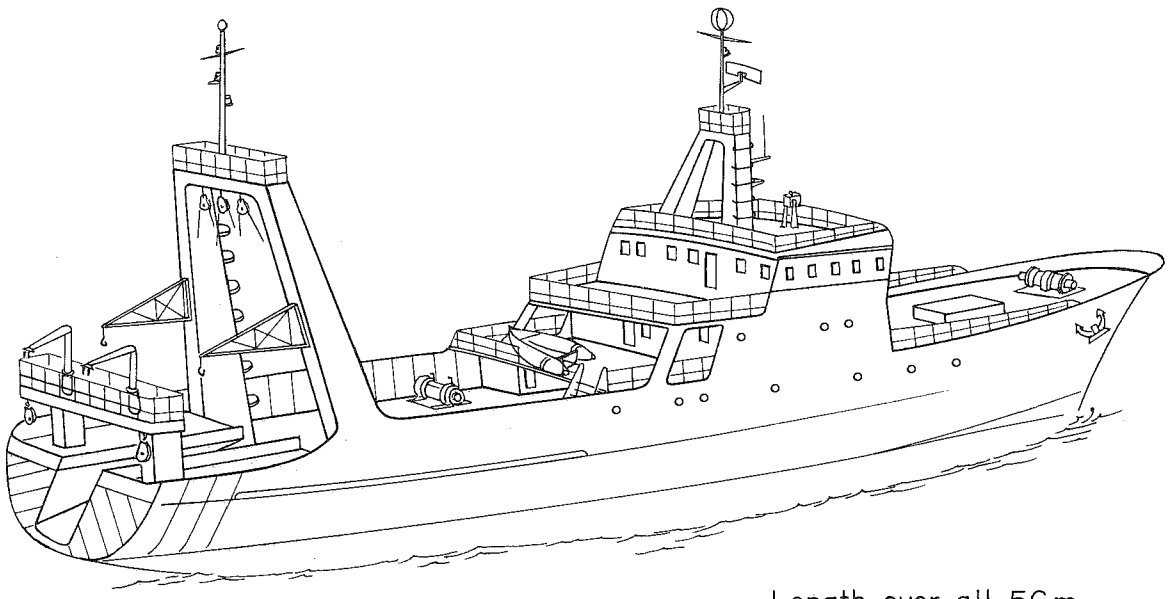


Figure 4 Freezer trawler

1.5 Factory trawlers

These are generally large stern trawlers equipped with processing plant including mechanical gutting and filleting equipment with accompanying freezing installation, fish oil, fish meal and sometimes canning plants.

Separate holds for each of the products are provided.

Factory trawlers have a large crew, the greatest portion of which consists of fish factory crew.

Extensive superstructures combined with stern trawling arrangements are typical features of factory trawlers.

1.6 Outrigger trawlers

These trawlers use strong outrigger booms to tow their fishing gear. These outriggers are usually fastened to the mast and extend out from the sides of the vessel each towing one or two trawls by means of warps passing through blocks at the ends of the outriggers. The most widely used method with these vessels is for shrimp trawling as illustrated in Figure 6.

Another method using outriggers, shown in Figure 5 is practised in the North Sea in which very heavy outriggers and gear are used to tow trawls fitted with beams and heavy bottom gear which is principally used for the capture of flat fish.

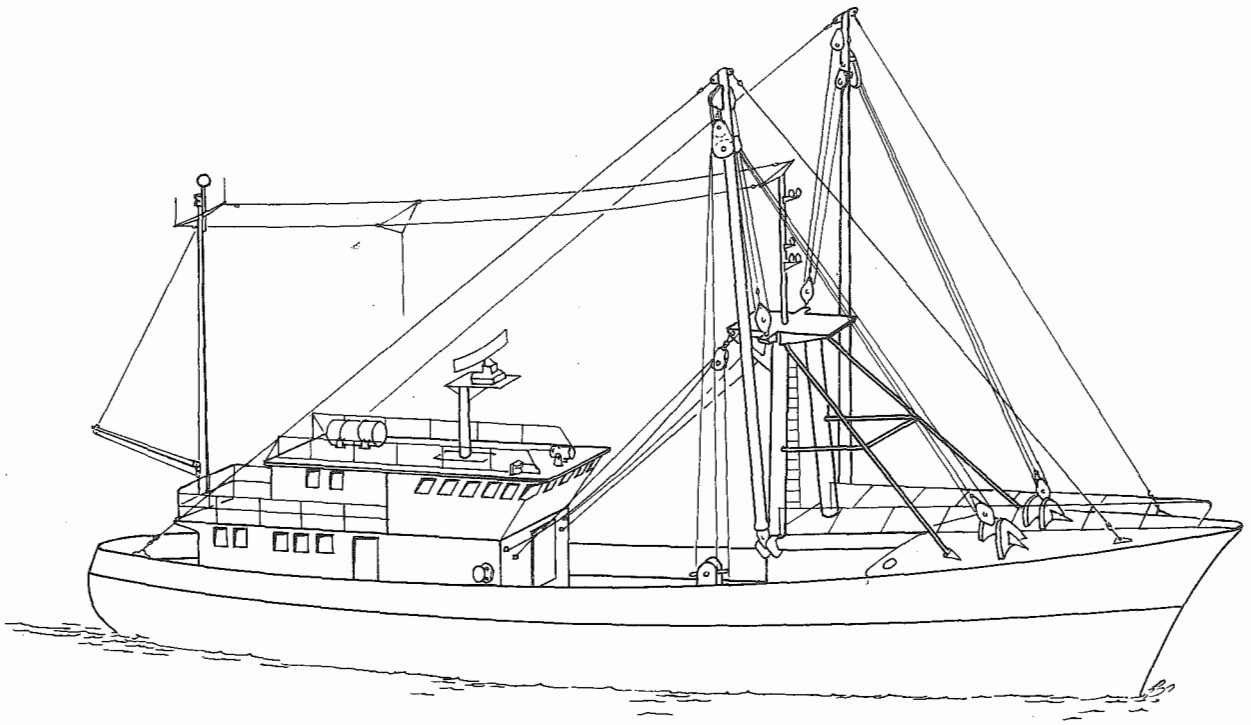


Figure 5 Beam trawler

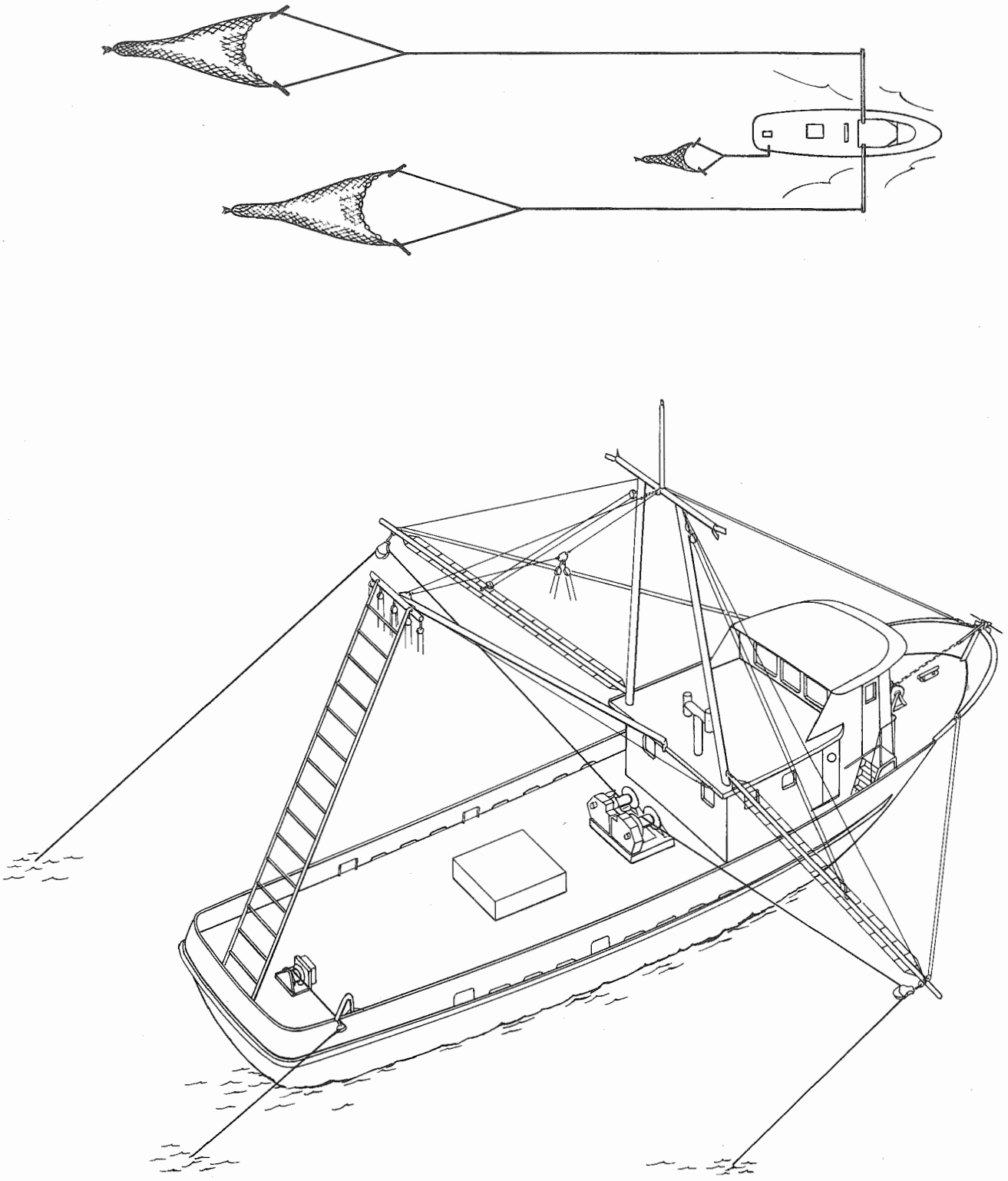


Figure 6 Outrigger trawler

2. SEINERS

These vessels use surrounding and seine nets. They comprise a large group appearing in all sizes, ranging from open boats and canoes up to large ocean going vessels. They are used to catch predominantly pelagic species.

Relatively high manoeuvrability is required for operation of the surrounding and seine nets. Large seiners are therefore often fitted with lateral thrusters.

To assist in fish school spotting observation crows nests are fitted on masts.

The equipment of seiners consists usually of a power block and/or a net drum for hauling and stowing the net aboard and one or more winches for setting and hauling operations. On boats and canoes, using small seine nets, all operations are generally performed by hand.

For removing of fish collected in the purse, a brailer attached to a derrick is provided. Species of small size are often removed by pumping arrangement. In that case a pump is lowered from the derrick into the pursed seine and the fish is pumped through a hose and a water separator on deck into the hold.

2.1 Purse seiners

Vessels using purse seines are equipped with pursing gallows and pursing winches for hauling the purse lines which close the net after setting, see Figure 7.

From the viewpoint of deck arrangement two main types of one boat purse seiners can be distinguished:

- the North American type, and
- the European type.

2.1.1. North American type purse seiners

These seiners have the bridge and accommodation placed forward.

The power block is slung from a derrick attached to the mast behind the wheelhouse. The winch is usually fitted with parallel drums and is situated opposite the pursing gallow.

The net is carried at the stern of the vessel.

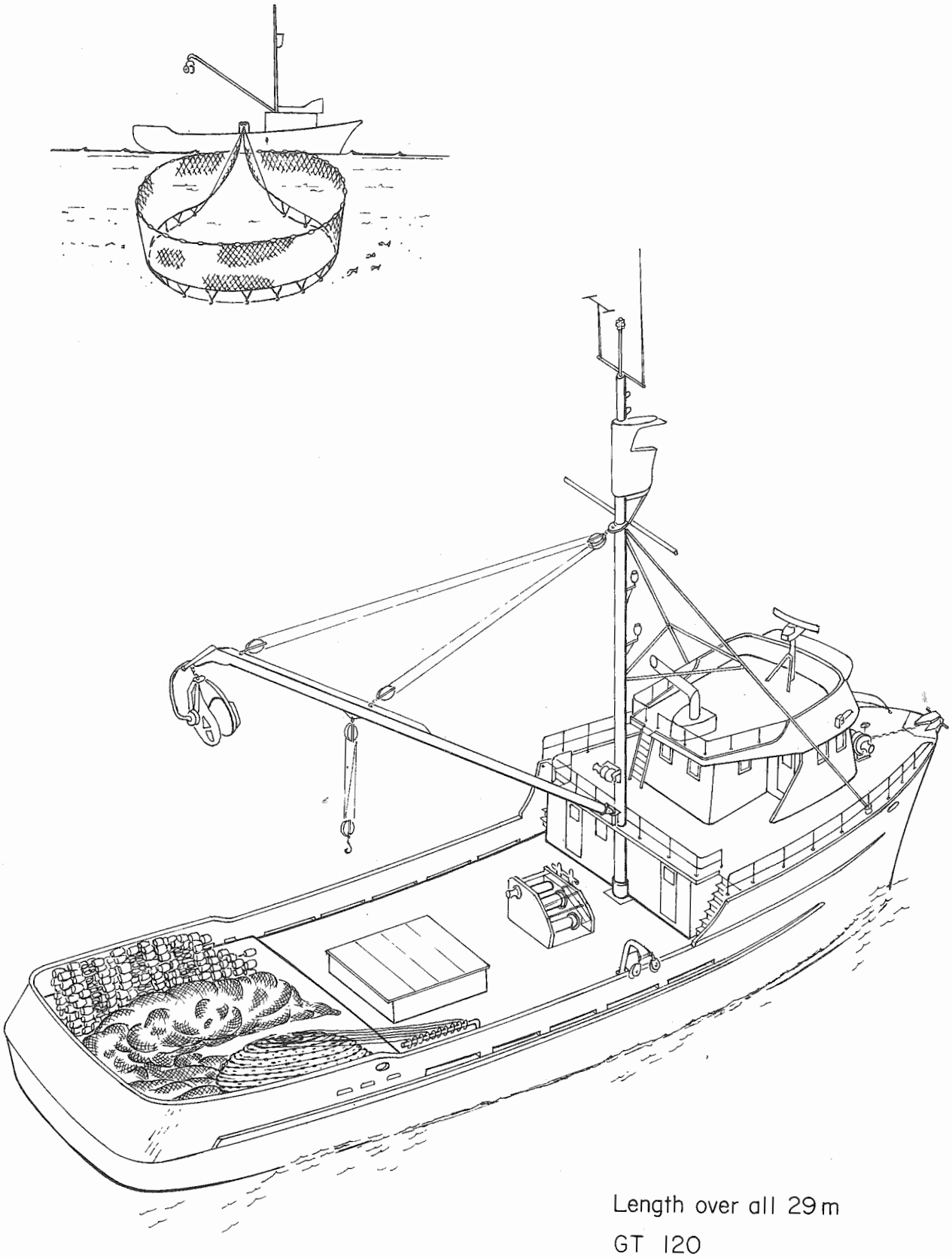


Figure 7 North American type purse seiner

2.1.2 European type purse seiner

This type of purse seiner has the bridge and accommodation located aft. The fish hold is situated amidships.

The net is mostly carried on the upper deck and the power block is fitted to the side of the bridge with separate transport blocks or rollers to stow the net on the aft deck (see Figure 8).

The pursing winch is normally situated forward with the drums facing the pursing davit.

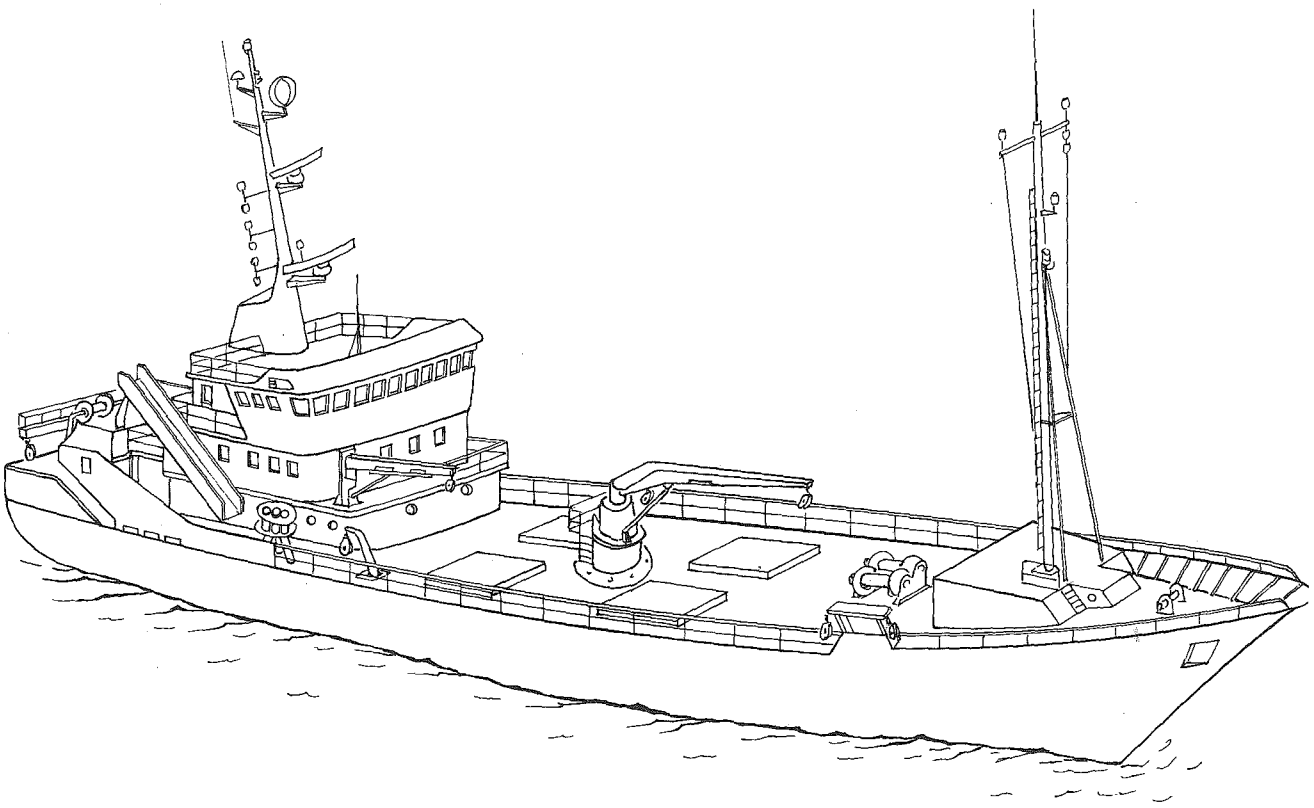


Figure 8 European type purse seiner

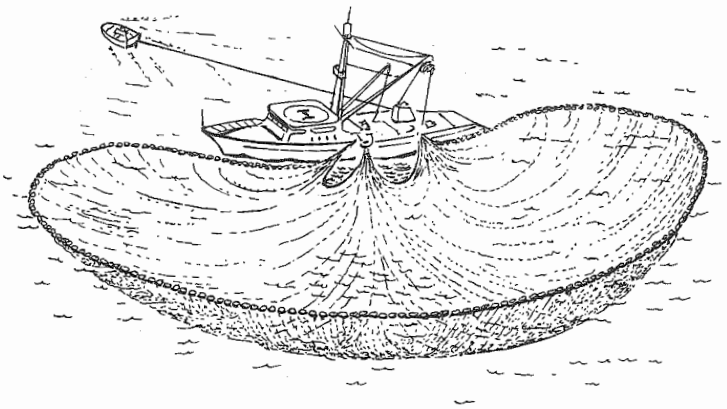
2.1.3 Tuna purse seiners

These vessels are large purse seiners with the same general arrangement as the North American type, equipped to handle very large and heavy purse seines for tuna.

They are normally equipped with a skiff located on top of the net at the sloped part of the stern of the vessel.

Their deck equipment consists of a three drum purse-seine winch and a power block, with topping, vang, cork and other specific winches to handle the heavy boom and net.

A crows nest is placed at the top of the mast. The search for tuna schools is often carried out by a helicopter, for which a landing platform is provided.



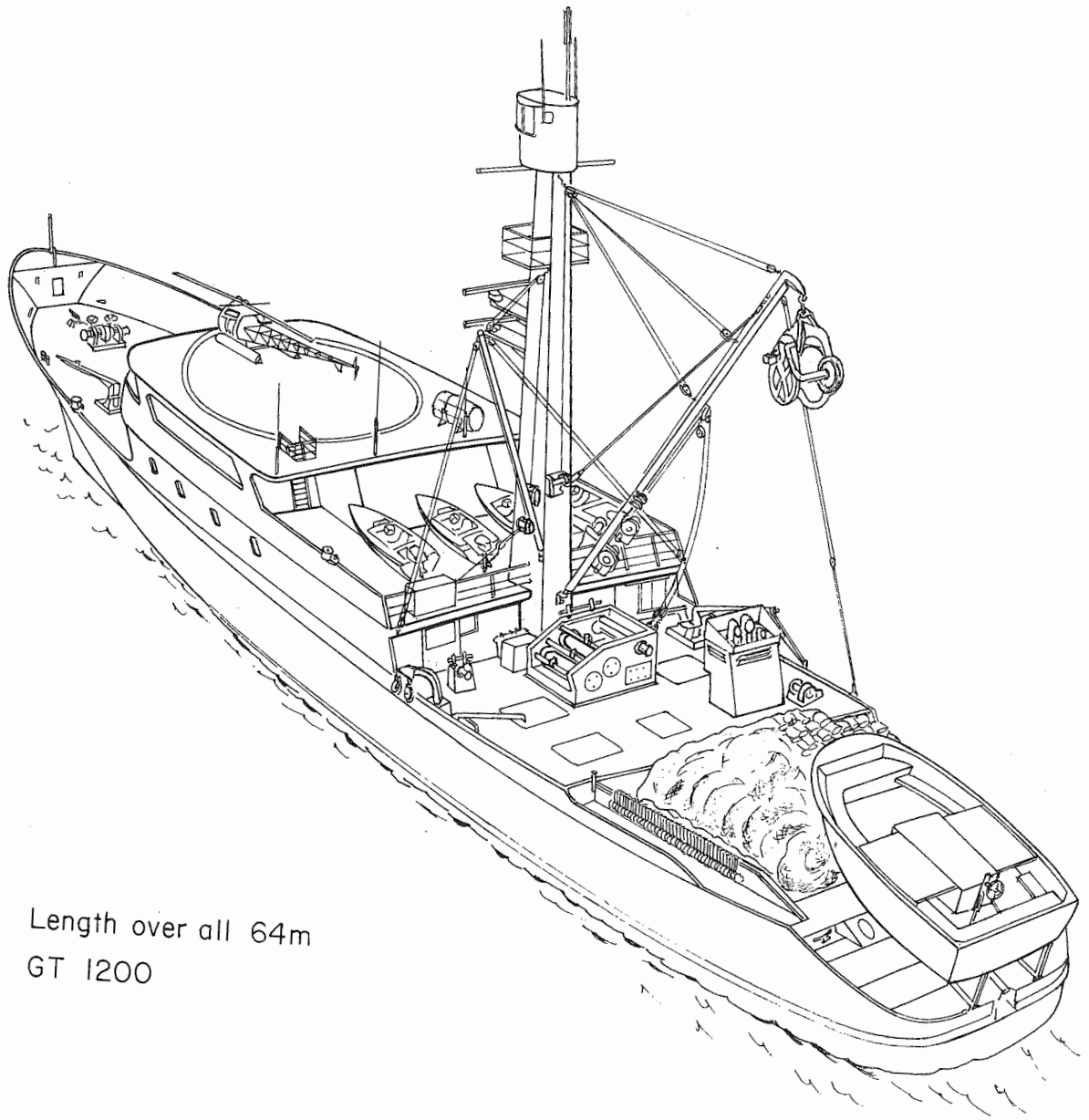


Figure 9 Tuna purse seiner

2.2 Seine netters

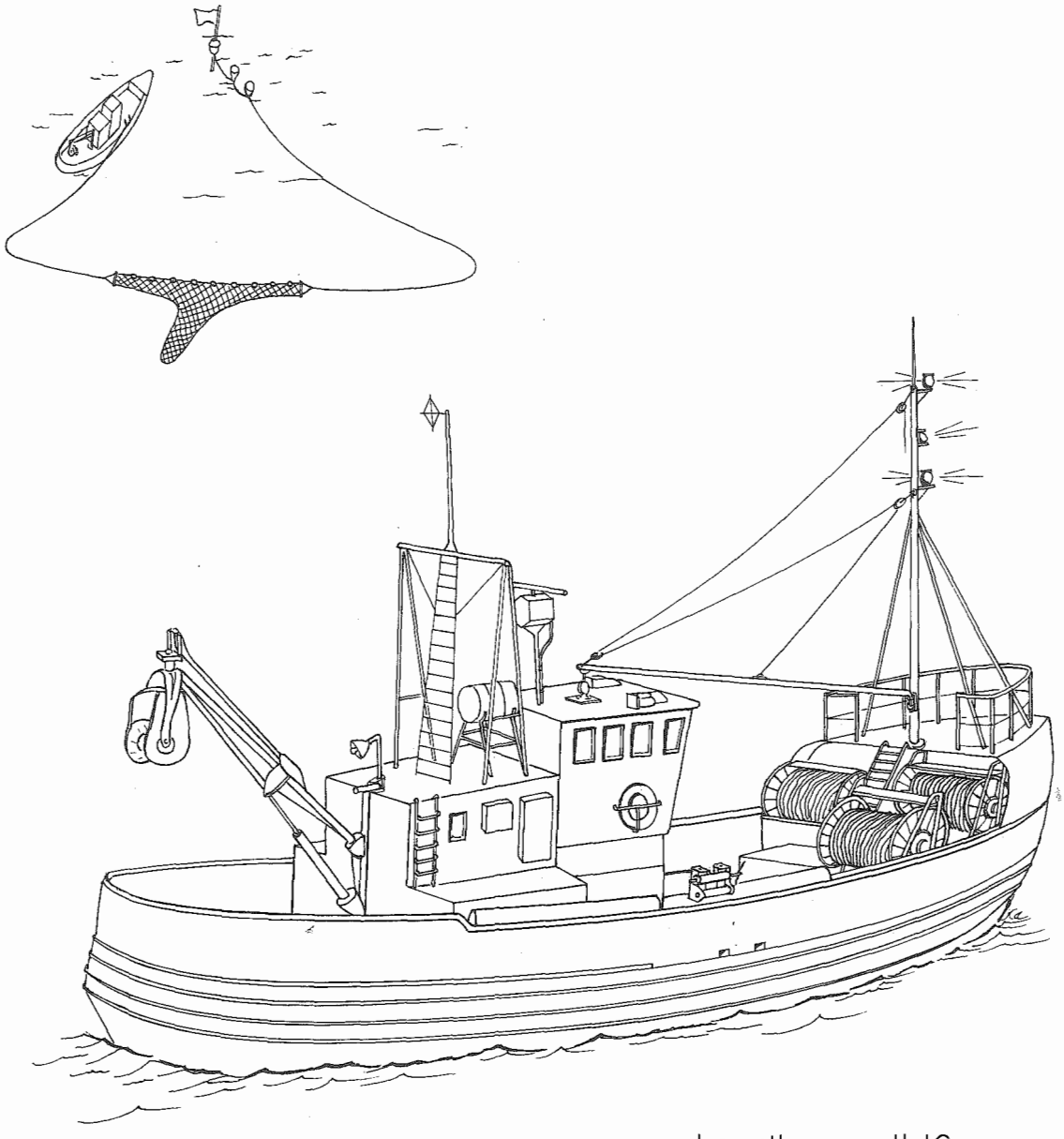


Figure 10 Seine netter

For this fishing method, fishing area is surrounded by a net attached to very long ropes. Next the net is towed or dragged over the bottom. It is not to be confused with purse seining which is an encircling net used for catching schooling fish.

The nets used in this type of fishery are similar to light high-opening bottom trawls but they use long lengths of seine rope spread out on the sea bed on each side of the net as shown in Figure 10. Anchor seining (dragging), often known as Danish seining due to its country of origin, uses an anchor which is buoyed and to which the first rope is attached.

The vessel lays out the ropes and net returning to pick up the anchor line to which the vessel lies during the hauling process. The second variation, fly dragging or Scottish seining, does not use an anchor, instead a combination of winch and propeller is used to simultaneously pull and close the gear as shown in Figure 10. The vessels using this gear resemble side trawlers as almost all have the wheelhouse and accommodation aft. The main problem in deck layout is stowing the ropes. They may be laid in coils on the side deck, or in bins extending from the deck to the fish hold floor. The best modern way of handling them is to put them on hydraulic reels fitted on deck. The winch itself is a small but fast and powerful two-barrel type to which a coiler maybe attached if the ropes are coiled on deck or in bins. A power block is fitted aft and the net is hauled in there. The cod-end is lifted aboard on the side deck. A variation of the method is used by modern Japanese seiners in which the gear handling area is located aft and the wheelhouse forward.

3. DREDGERS

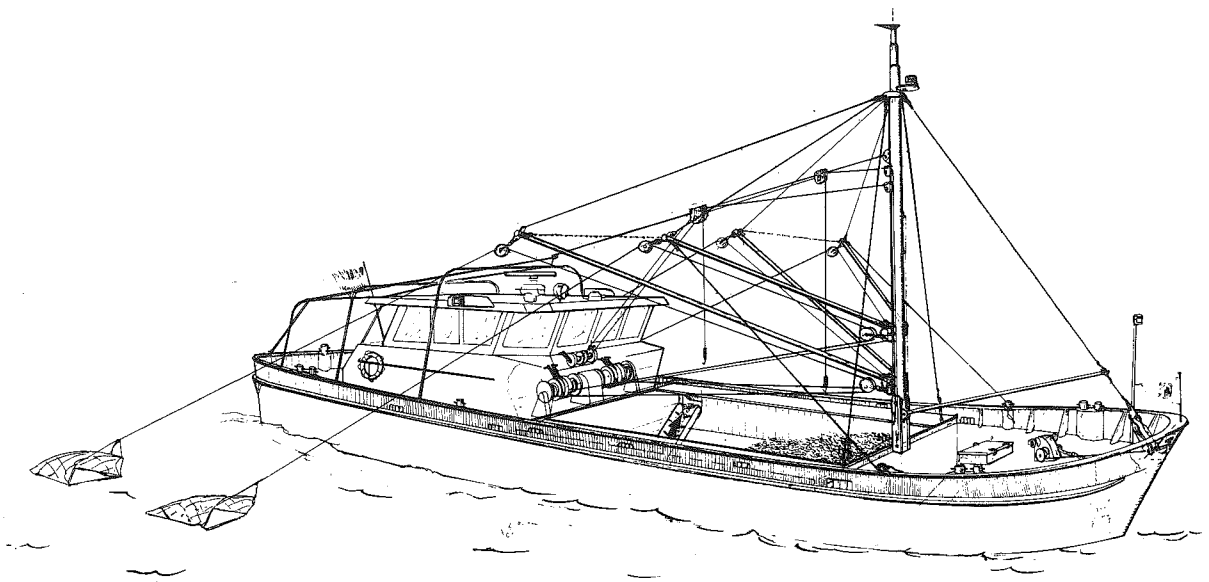
These vessels use a dredge for collecting molluscs from the bottom. The vessel drags the gear and the power requirements can therefore be similar to those of a small trawler.

A powerful water pump is necessary to operate the waterjets of a mechanical dredge.

For lowering and lifting of the dredge, derricks and winches are installed.

Small boat dredges are operated from boats and other small vessels.

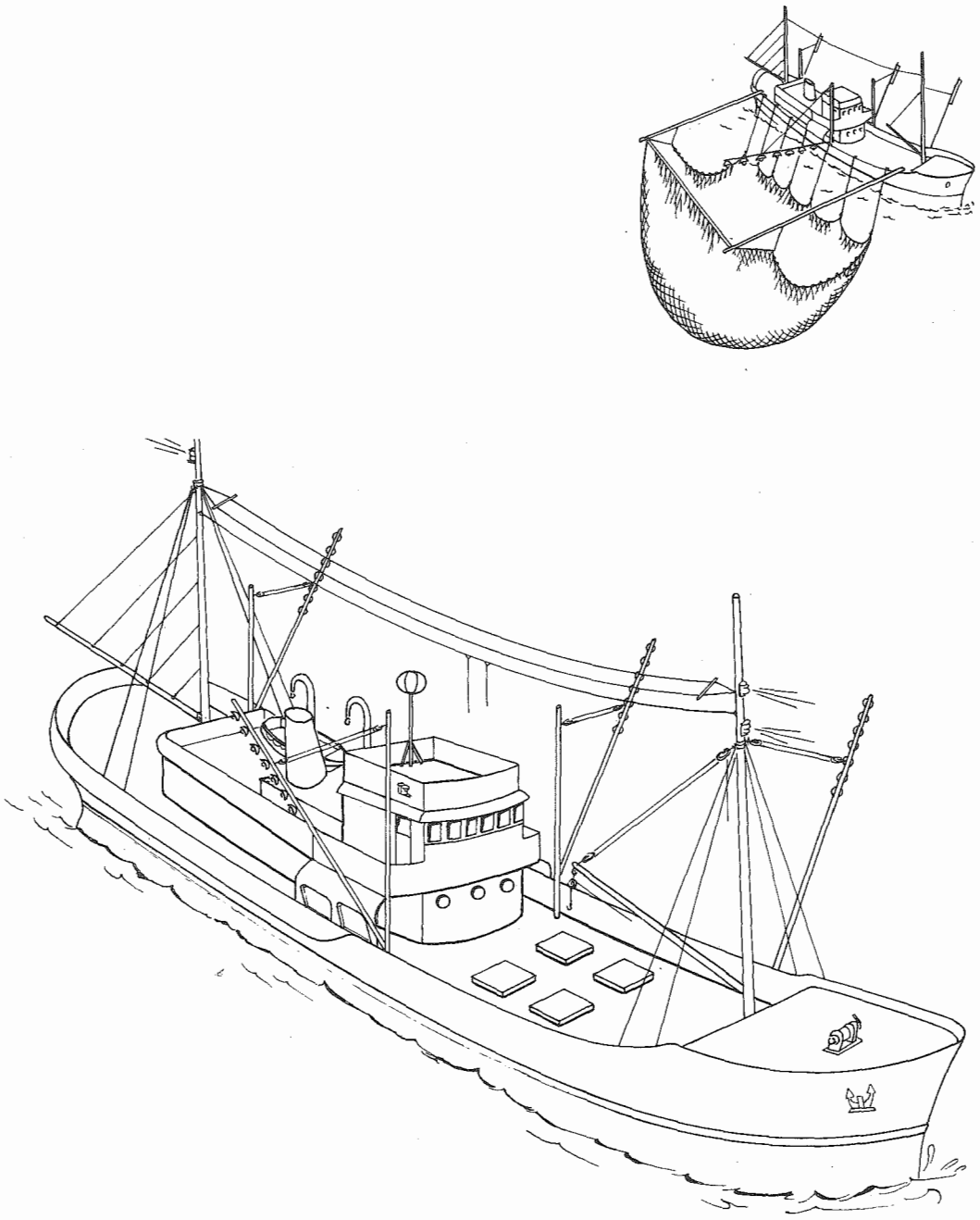
Some small inshore dredgers operating in shallow waters can also push a gear fixed to a beam extended from the bow.



Length over all 22 m

Figure 11 Dredger

4. LIFT NETTERS



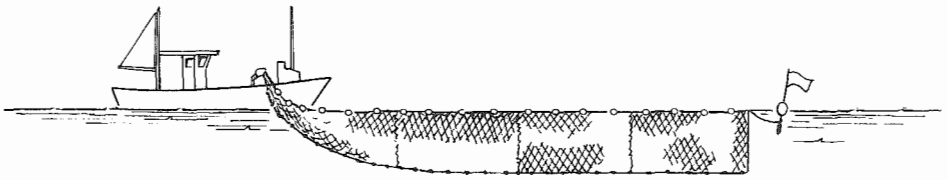
Length over all 45 m
GT 500

Figure 12 Lift netter

These vessels are equipped for the operation of large lift nets which are held out from the ship's side and raised and lowered by means of outriggers as seen in Figure 12. Sets of powerful lights for fish attraction are mounted as shown, and often used simultaneously with underwater lights.

The vessels have the bridge amidships and are fitted with derricks and winches for handling the lifting lines, outriggers and light booms.

5. GILL NETTERS



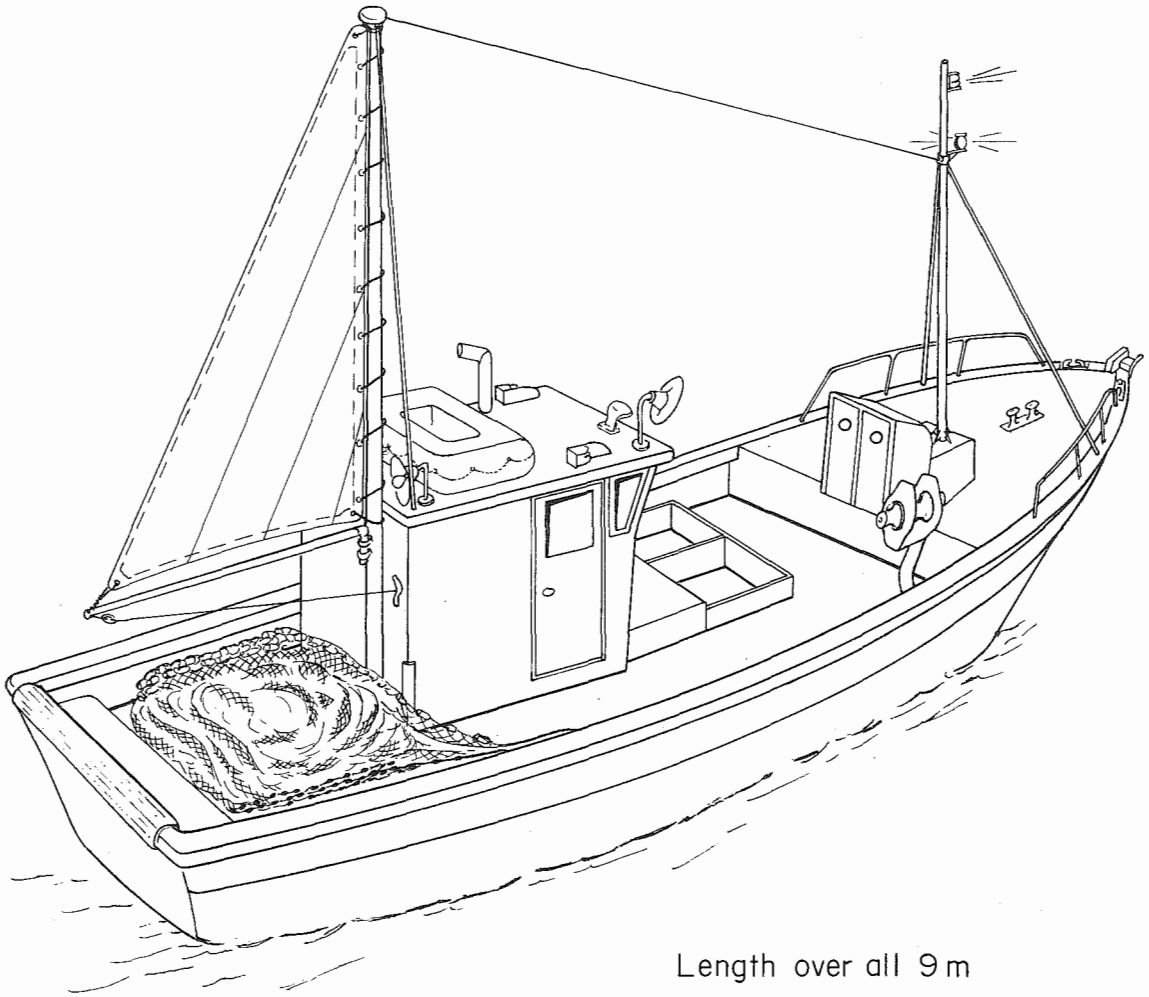


Figure 13 Gill netter

Gillnets can be operated from boats and canoes on inland waters and inshore, decked small vessels in coastal waters and from medium sized vessels fishing offshore.

Small gillnetters have their wheelhouse either aft or forward. On medium sized vessels, using drifting gillnets and called drifters, the bridge is usually located aft.

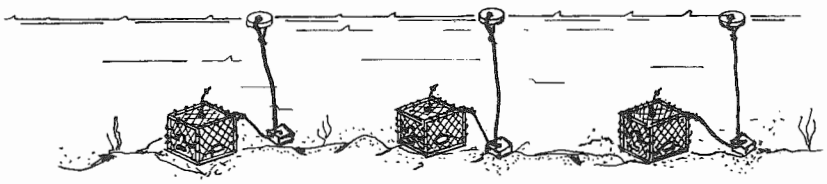
For drifters it is essential that they lay to windwards when drifting with the net. They are therefore often fitted with a steadying sail.

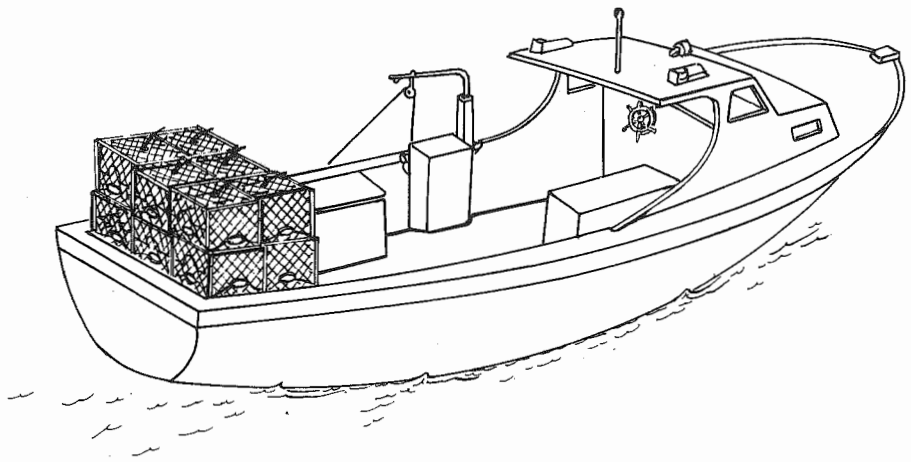
On small vessels setting and hauling operations are perfomed by hand. Larger vessels are often equipped with hydraulic net haulers or net drums.

6. TRAP SETTERS

This term includes vessels setting traps and pots but also pound nets, fyke nets, stow nets and various kinds of barriers.

6.1 Pot vessels





Length over all 6 m

Figure 14 Small pot fishing vessel

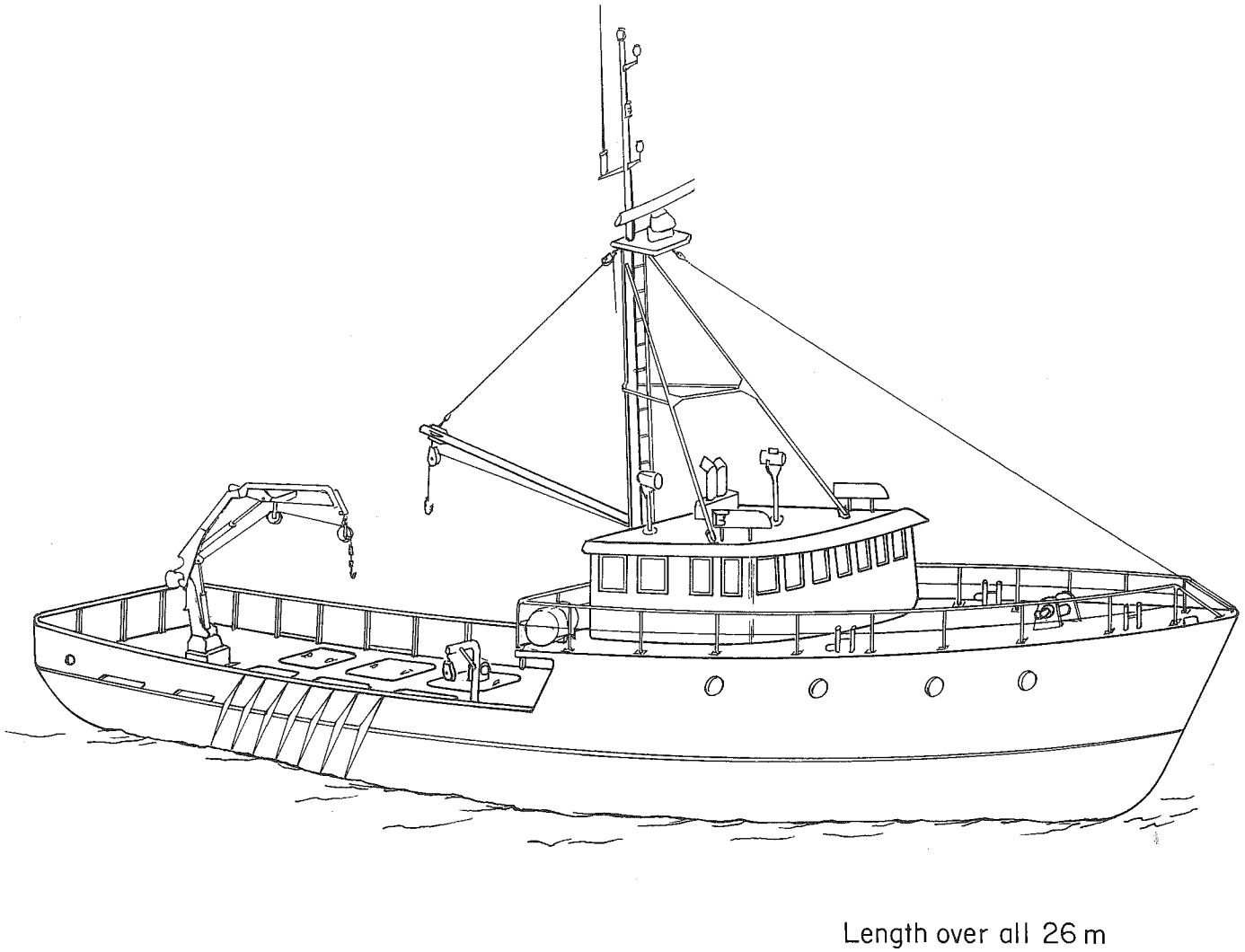


Figure 15 Large pot fishing vessel

These vessels are used for setting pots for catching lobsters, crabs, crayfish and other similar species. Pot vessels range from open boats operating inshore up to larger decked vessels of 20-50 m operating to the edge of a continental shelf.

On open and partly open boats the wheelhouse is placed forward. In the cockpit a suitable place to store pots is provided. A live well with sea water for transport of the catch is also situated on the cockpit.

On small decked pot vessels the wheelhouse is located either forward or aft and the fish hold amidships.

Larger pot vessels are equipped with derricks, cranes or davits for setting and hauling of pots. On smaller vessels mechanized pot haulers are fitted.

Inshore pot vessels are often designed for relatively high speed, because better prices can be obtained for catches arriving earlier on the market.

7. LINERS

These vessels use lines and hooks with or without bait or lure.

Depending on the method of fishing with lines, area of operation and species to be caught, liners comprise vessels of all size classes.

Containers or tanks for storing the bait, sufficient deck area for attaching the bait to the hooks and a convenient place for preparing the lines for setting and hauling are typical features for line fishing vessels.

7.1 Handliners

Handlines are operated from boats, canoes and other small vessels, without any special features for gear handling.

Handlines can be set and hauled either manually or by mechanised reel. If mechanized reels are used, these are fastened to the gunwale.

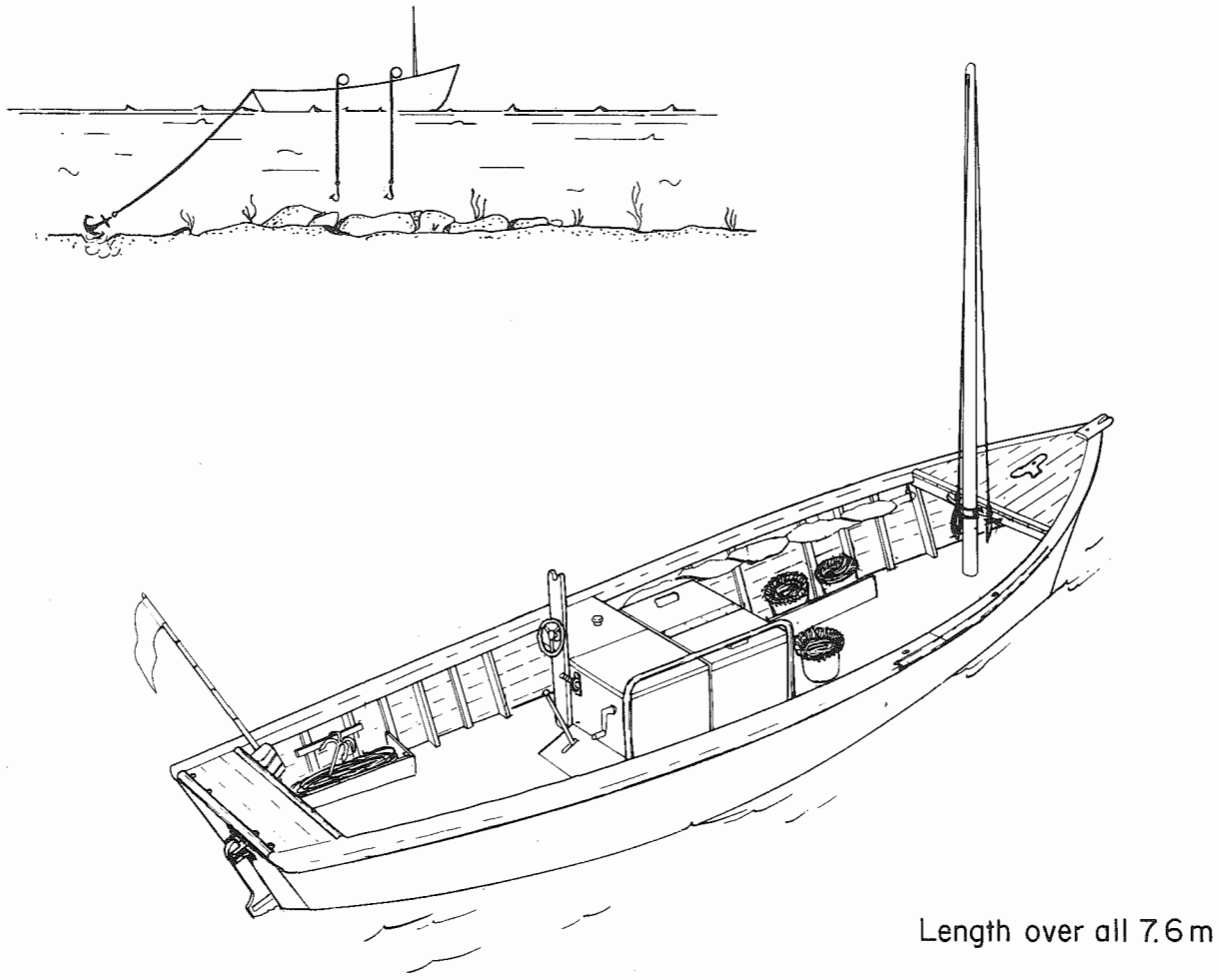


Figure 16 Handliners

7.2 Longliners

Longlines can be operated from vessels of any size adapted for the length of longline to be set. Bottom longlines are placed on or near the bottom and drifting longlines are maintained at the surface or at a certain depth by means of floats.

In typical arrangements the gear is hauled from the bow or from the side with a mechanical or hydraulic line hauler and the lines are set over the stern.

The wheelhouse can be situated aft or forward, but on larger vessels the bridge is generally placed aft. Several automatic or semi-automatic systems are used on bigger boats to bait the hooks and to shoot and haul the lines. Some systems are shown in Figures 17 and 18.

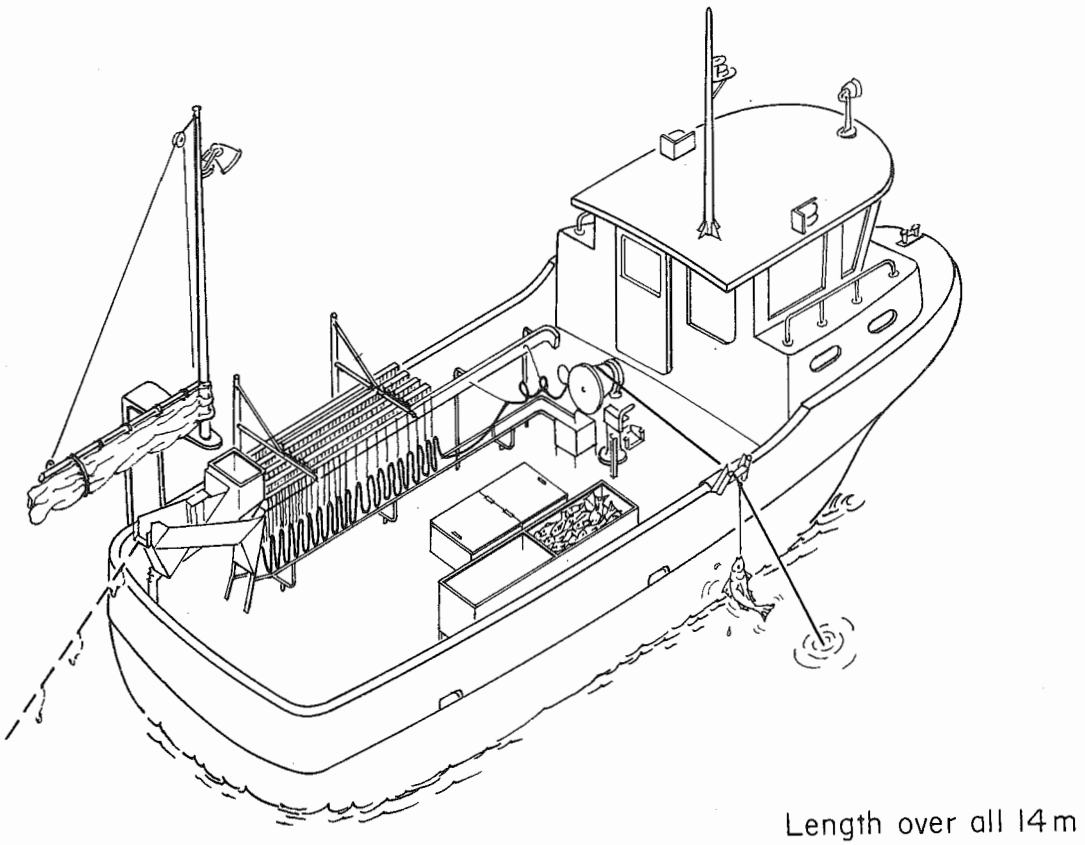
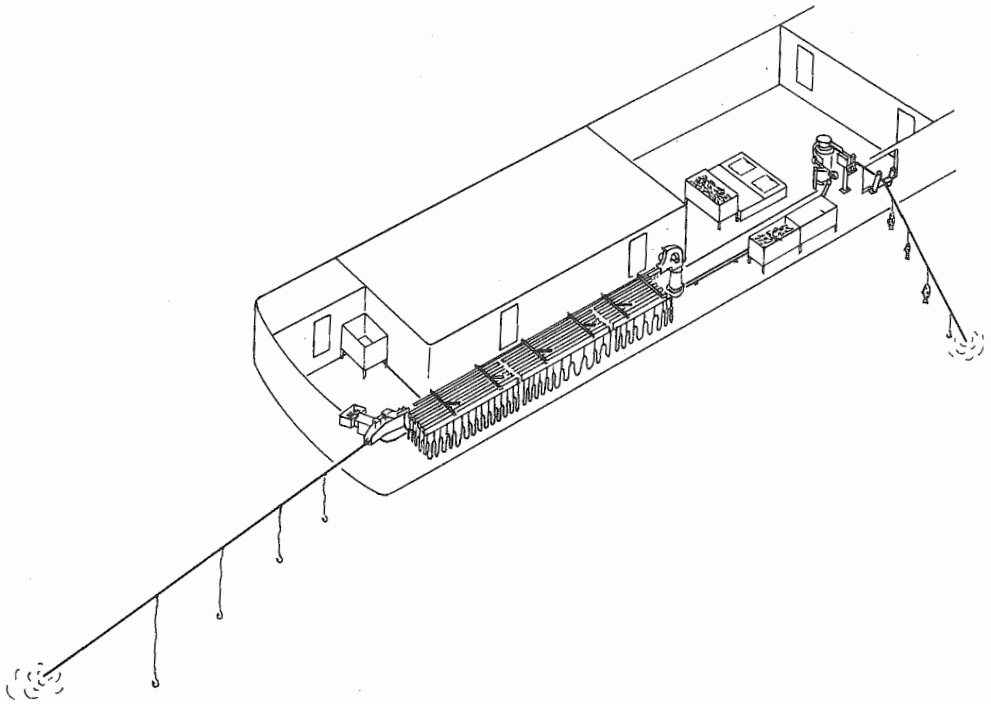
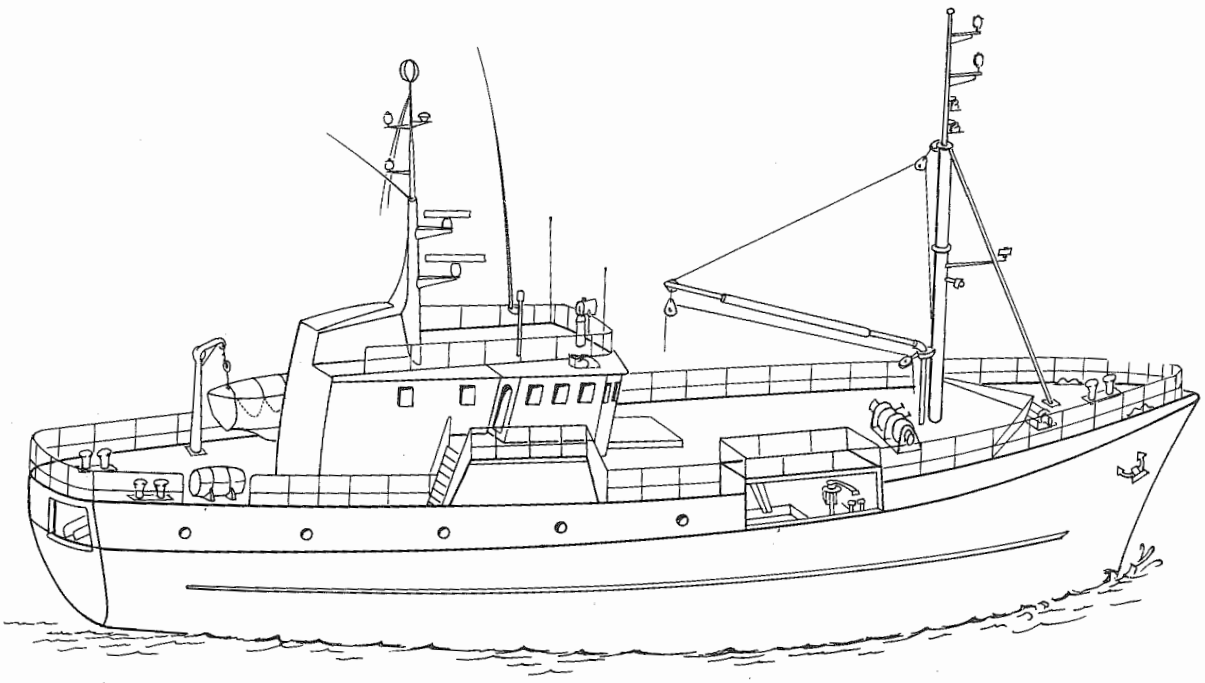


Figure 17 Small longliner





Length over all 33m

Figure 18 Large longliner

7.3 Tuna longliners

These are generally medium sized vessels.

The line hauler on tuna longliners is usually placed on the star-board side forward and a gate in the rail is provided to haul in the fish.

The long lines and the buoys are then carried by a conveyor to the after deck ready for baiting and setting.

A baiting table and a chute are located on the stern, from where the lines are set.

Typical equipment of a tuna longliner includes brine freezing tanks in which the tuna is preserved.

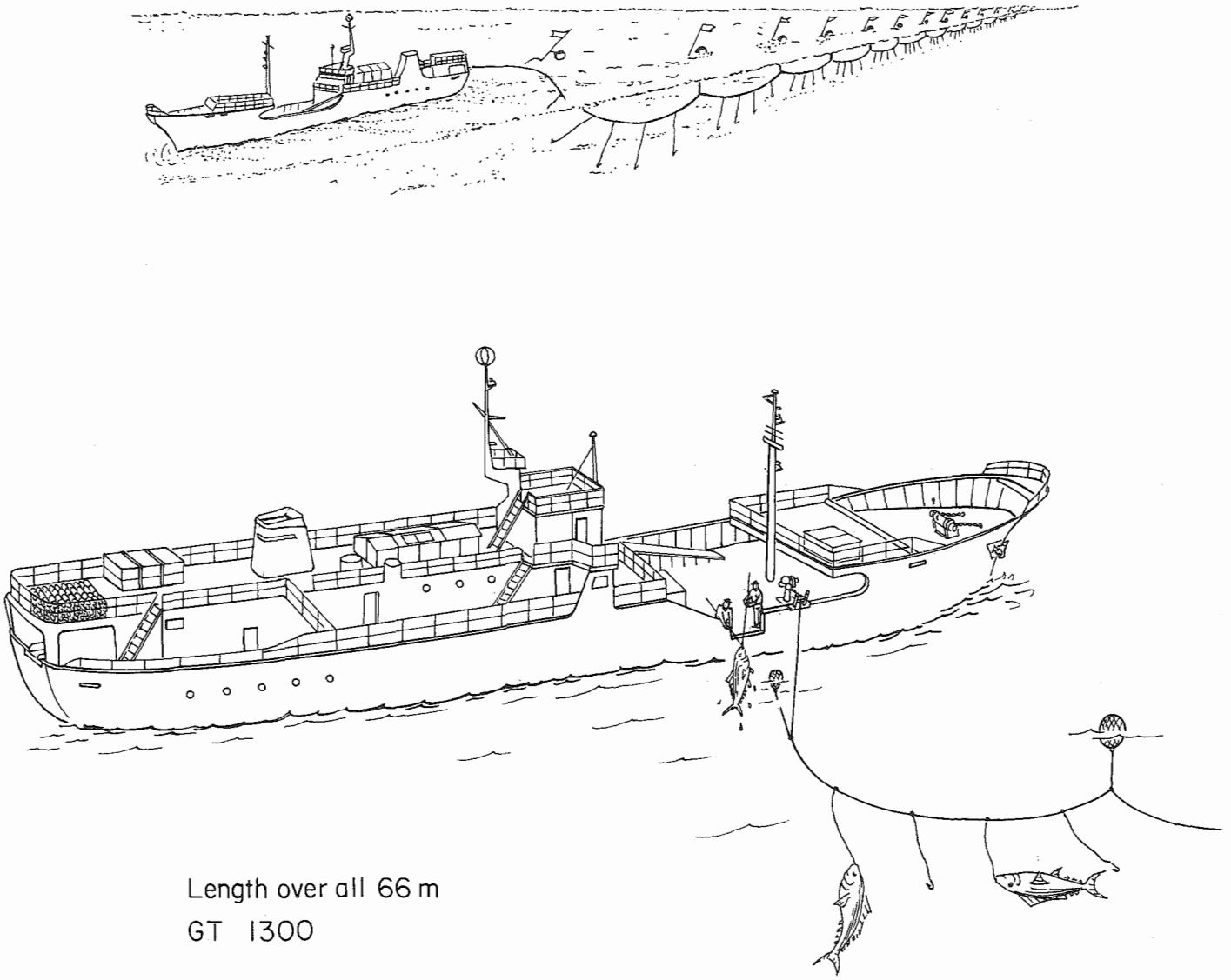


Figure 19 Tuna longliner

7.4 Pole and line vessels

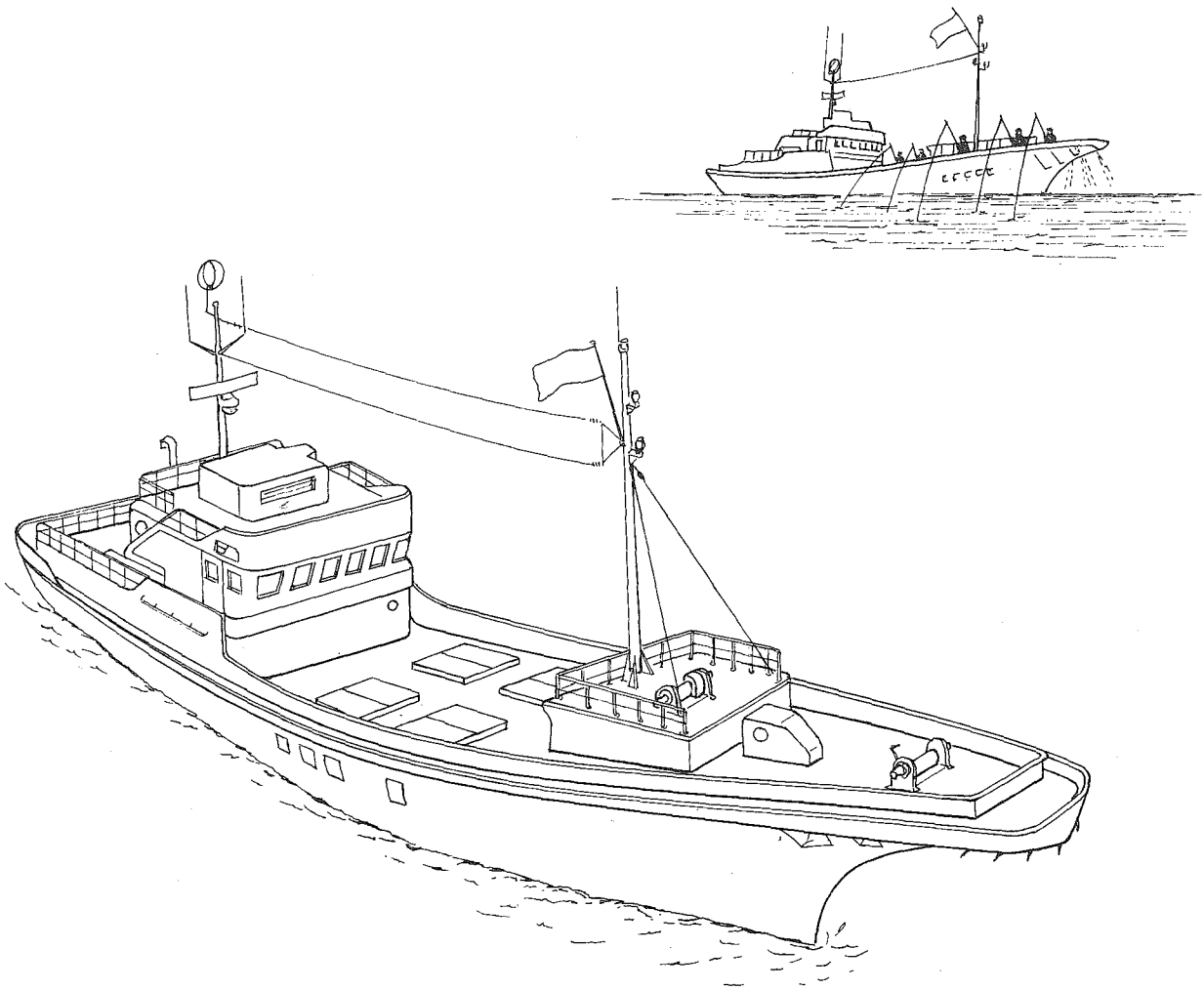
On these vessels, used primarily for catching of tuna and skipjack, the fishermen stand on the railing or on special platforms and fish with poles, to which a line with hook is attached.

Tanks with live bait and a water spray system for fish attraction are typical features of these vessels. Because live bait is used to attract fish, the fishing method is also known as live-bait fishing.

Two types of pole and line vessels can be distinguished:
- the Japanese type,
- the American type.

7.4.1 Japanese type pole and line vessels

On these vessels the fishermen stand at the railing on the forward part of the vessel and the bridge is accommodated aft. The holds are placed in the middle part of the vessel.



Length over all 38 m

GT 300

Figure 20 Japanese type pole and line vessel

7.4.2 American type pole and line vessels

On these vessels the platforms for fishermen are located around the stern of the vessel with bait tanks on the deck aft and wheelhouse situated forward.

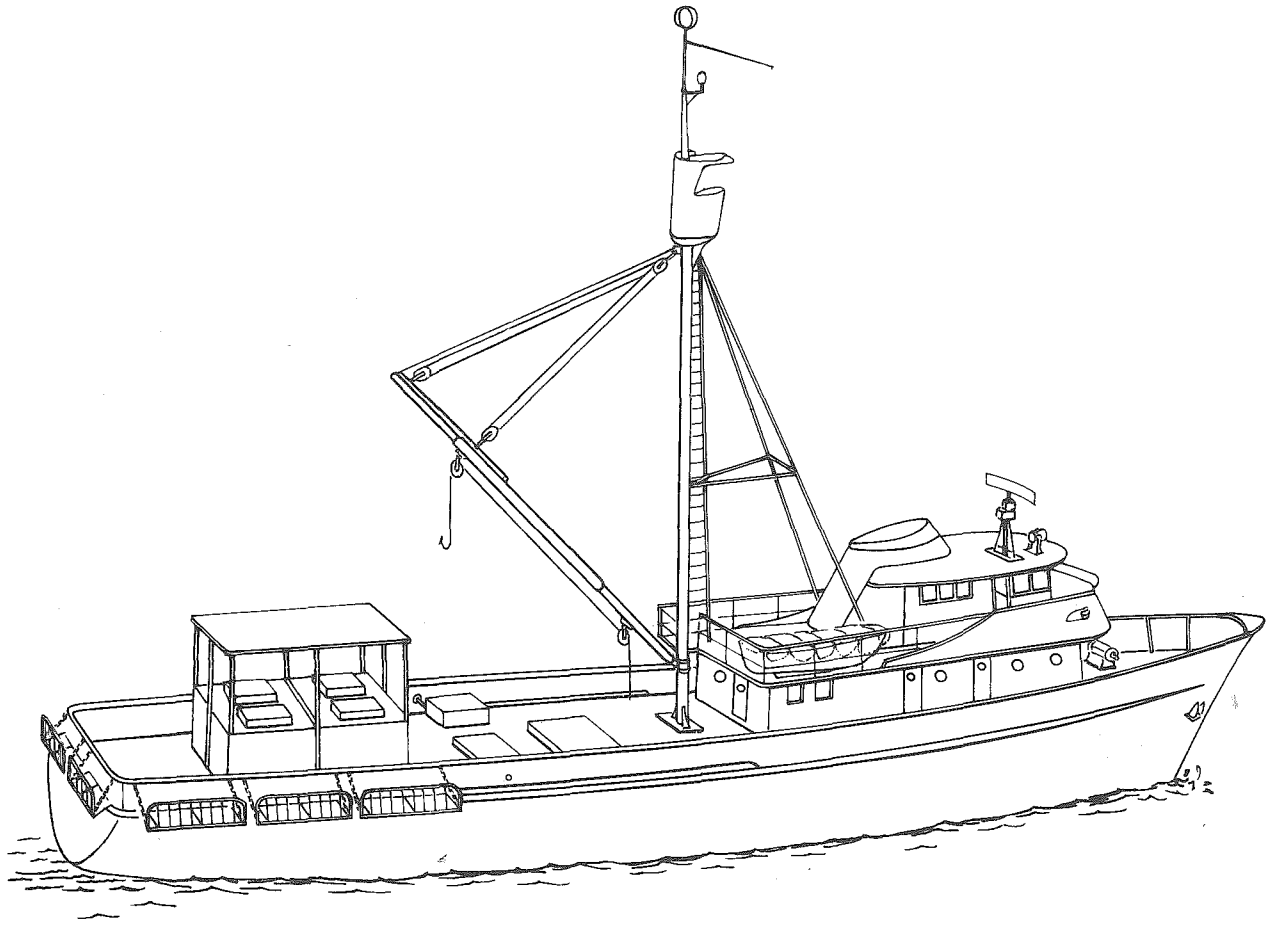


Figure 21 American type pole and line vessel

7.5. Trollers

Equipped for catching pelagic fish swimming close to the surface these vessels tow a number of lines fitted with lures.

The lines are attached to trolling booms which are raised and lowered by topping lifts and fore and aft stays. Hydraulic or electrically powered reels (gurdies) are frequently used to haul in the lines as shown in Figure 22.

According to area of operation, vessels may be laid out with wheelhouse and mast either forward or in the after part of the vessel.

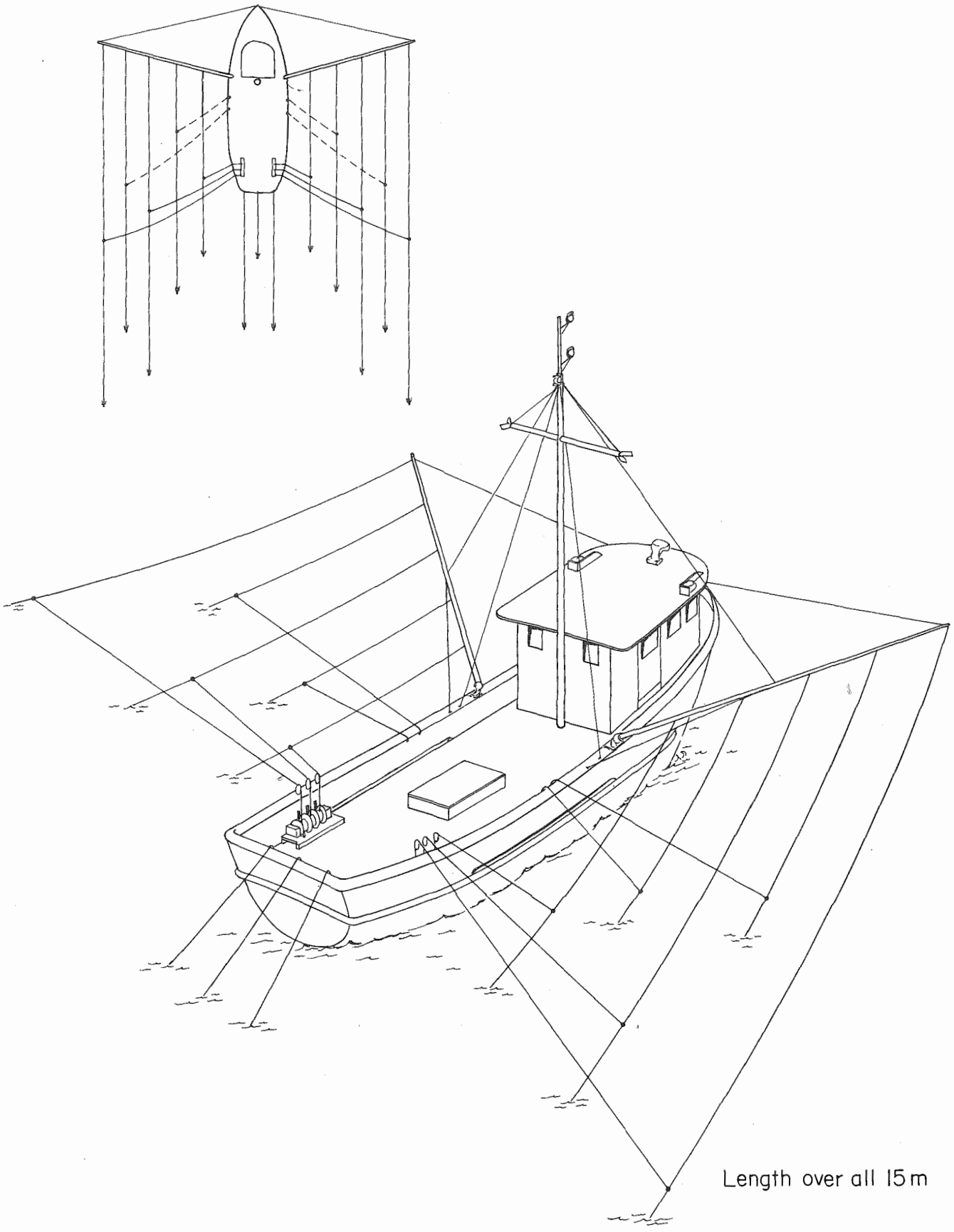


Figure 22 Troller

8. VESSELS USING PUMPS FOR FISHING

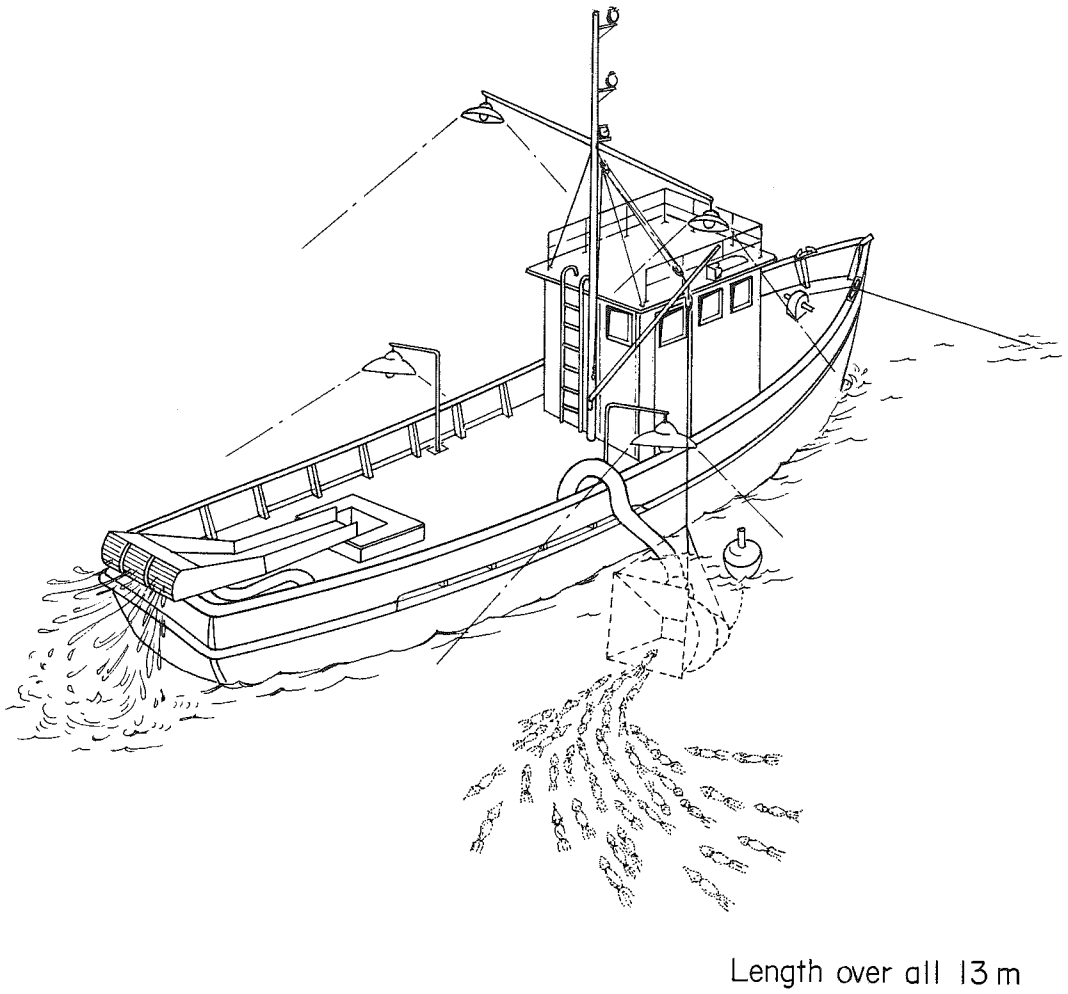


Figure 23 Vessel using pump for fishing

These vessels are provided with pumps of special construction. During the fishing operations the pump is lowered under the surface of the water.

The pump is suspended on the hook of a derrick and is operated from the vessel's electrical plant.

Small fishes attracted by light from a lamp situated above the suction side of the pump are sucked and pumped with water on board, where a fish-water separator is installed.

9. MULTIPURPOSE VESSELS

These are vessels which are equipped for alternative use of two or more different fishing gear without major modifications to the vessels' outfit and equipment.

The simplest examples of this concept are traditional open craft which operate one of the surrounding net types of gear, e.g., purse seine, during the seasonal appearance of pelagic species and handlines for demersal fish during the remainder of the year - no special features or equipment are used and the appearance of the craft is unchanged.

Other examples of combinations in common use are gillnetter/longliner, trawler/gillnetter, trawler/purse seiner etc., with a variety of other gear being used in cases where gear and equipment investment is not high and layout changes minimal, e.g., a gillnetter may use handlining, trolling and trap fishing when seasonal variations are appropriate.

For illustrative purposes, two trawler/seiner combinations are shown in Figures 24 and 25.

9.1 Trawler/Purse Seiner

This combination of fishing gear requires that the deck arrangement and equipment be planned in advance for dual use.

As the power requirement for trawling is higher the vessel is usually designed as a trawler with a suitable combination winch for both methods.

In the vessel illustrated the combined trawl/seiner winch is placed longitudinally behind the wheelhouse which is situated in the forward part of the vessel.

The lead of warps and pursing lines is assured by rollers, blocks, trawl gallows and purse davit with the layout planned to reduce to a minimum the time needed for conversion from one type of fishing to another.

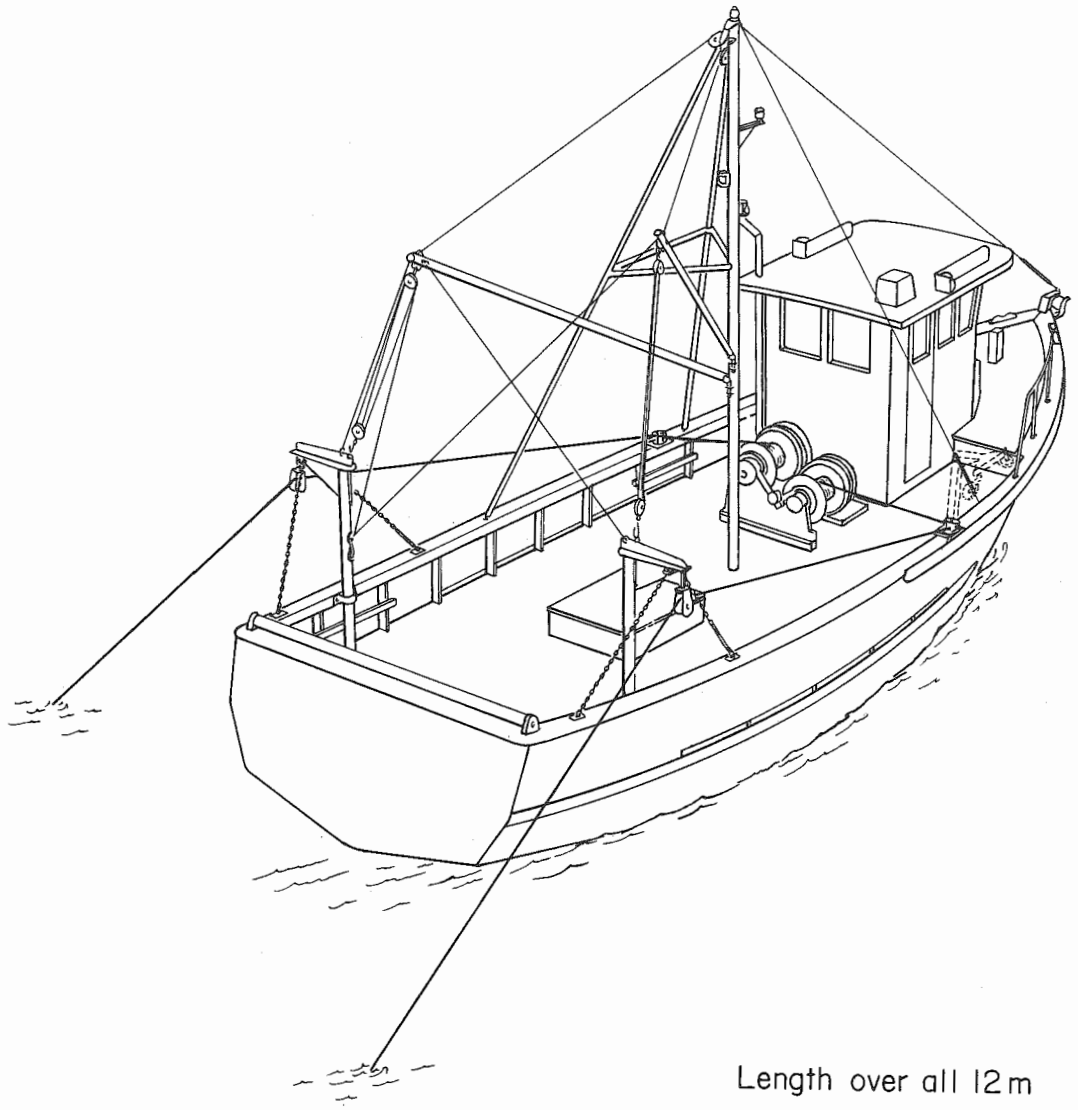


Figure 24 Trawler/purse-seiner

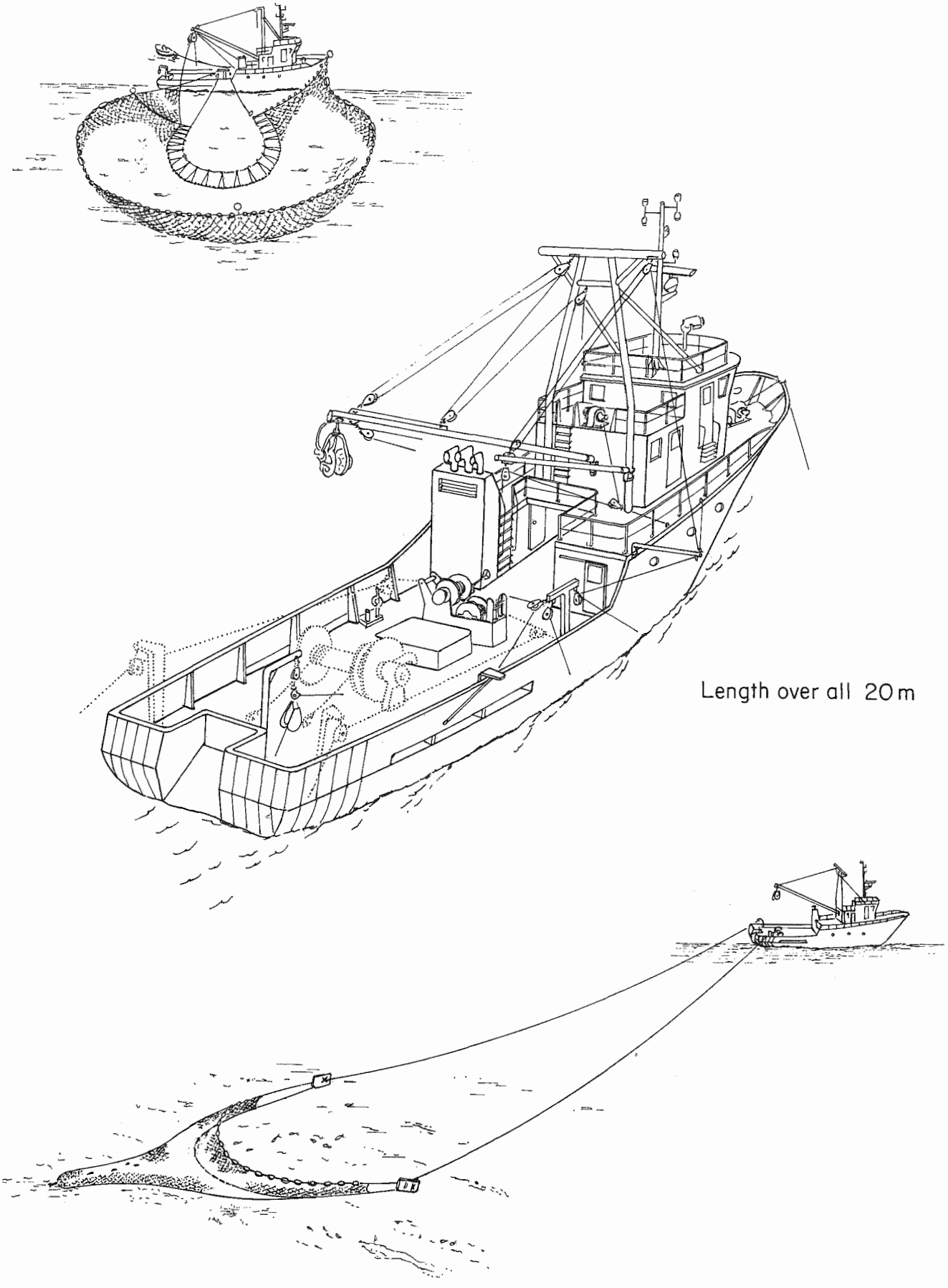


Figure 25 Trawler/seiner

NON-FISHING VESSELS

10. MOTHERSHIPS

These vessels provide fishing vessels at sea with supplies of fuel, provisions, fresh water and other consumable goods, transfer the catch from the vessels, process and preserve the fish, render medical and social services to the crews. They also transport and land fish products in port. In this category the following two types of motherships can be distinguished:

- salted fish motherships,
- factory motherships.

The term "mothership" is also used for vessels, which carry on board small fishing vessels; on arrival at the fishing grounds the fishing vessels are launched and perform the fishing operations. The catch is transferred to the mothership for processing and preserving. At the end of the fishing period the fishing vessels are hauled aboard and the mothership returns to the port. This category is represented by the following two types of motherships:

- motherships with tuna longliners aboard,
- motherships for two-boat purse seining.

10.1 Salted fish motherships

These vessels cooperate with trawlers or drifters in unloading wet fish on the mothership where the fish is salted, cured and put into barrels which are then stored in dry or refrigerated holds, depending upon the degree of salting.

The general arrangement of these vessels is that of the three island type. The accommodation and bridge are concentrated amidships and the holds are situated forward and aft.

For the loading operation masts, derricks and winches are installed.

The vessel has sufficient tank capacity and provision rooms to provide the fishing vessels with fuel, fresh water and provisions.

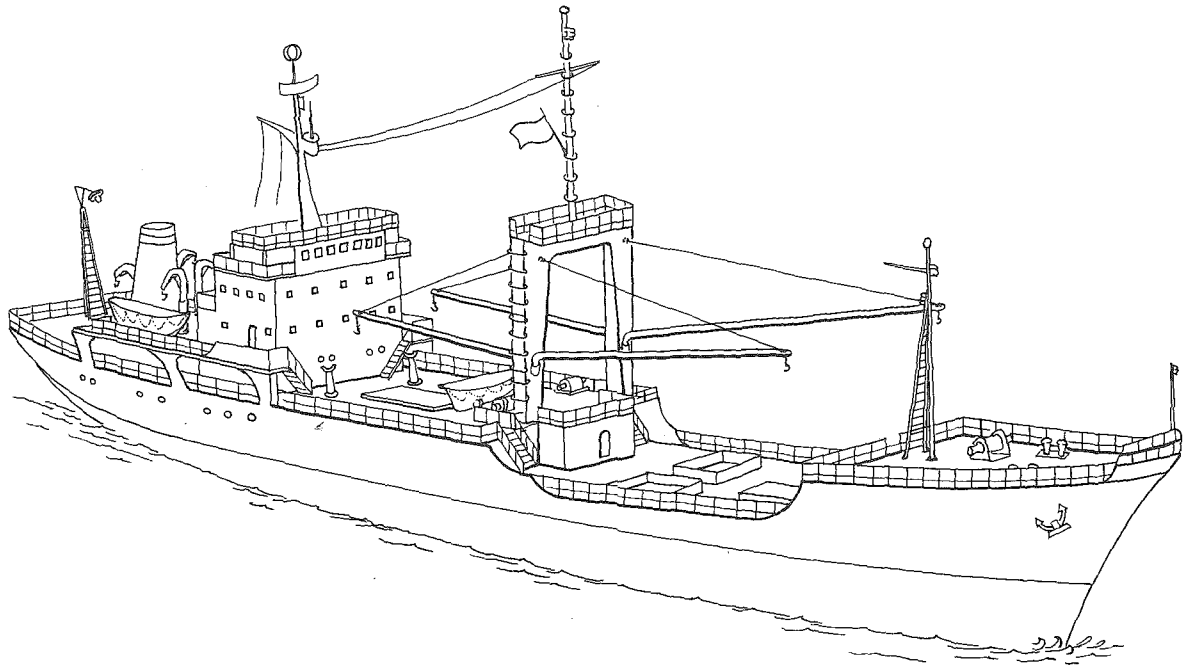
Bathrooms, medical services, library and cinema are provided for the use of crews from the fishing vessels during the loading operations.

10.2 Factory motherships

In this category of mothership fresh fish transferred at sea from fishing vessels undergoes processing and preserving operations similar to those which are provided on factory trawlers.

The engine room and the main part of the crew quarters are located aft. The bridge and the remaining part of the accommodation on larger vessels could be situated forward. In the middle part of the vessel the processing and freezing lines are installed on the tweendecks and refrigerated holds are placed under the main deck.

Facilities for recreation and medical services are also provided on board.



Length over all 98 m
GT 3500

Figure 26 Factory mothership

10.3 Motherships with catching vessels aboard

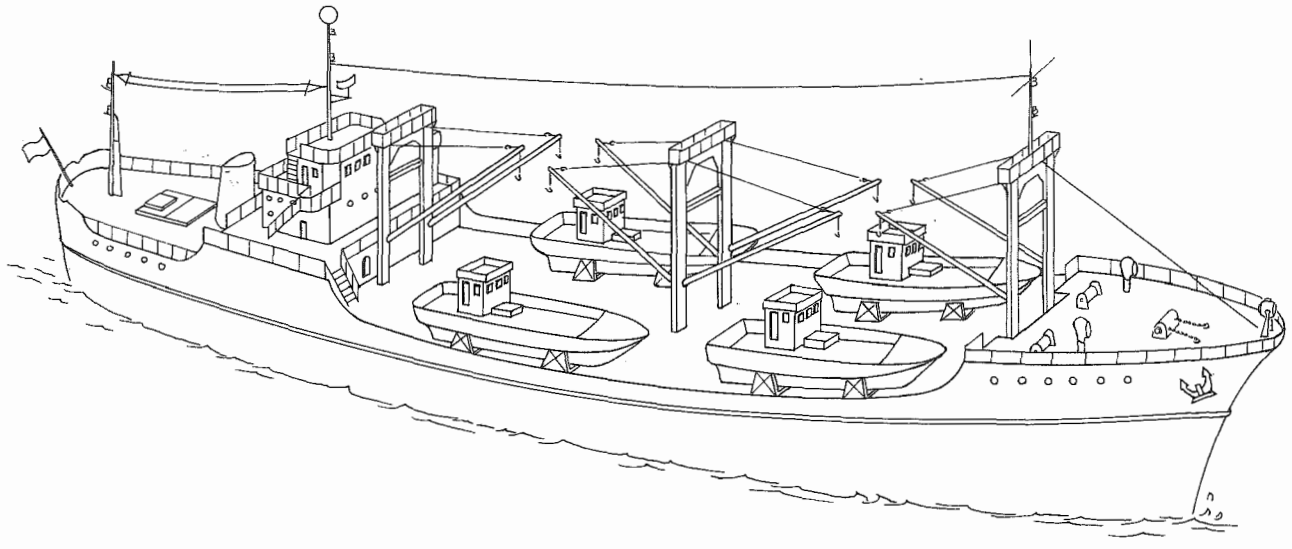


Figure 27 Mothership with catching vessels aboard

This type of mothership carries small tuna longliners (about 15 m in length) on board. The longliners are launched at the fishing grounds and perform the fishing operations, transferring the catches to the mothership for processing, freezing and storing in refrigerated holds.

The vessel has the engine room, accommodation and bridge situated aft. Holds are located in the middle and forward part.

The catcher vessels are carried on the upper deck and their lowering and hoisting is accomplished by special booms and derricks.

10.4 Motherships for two-boat purse seining

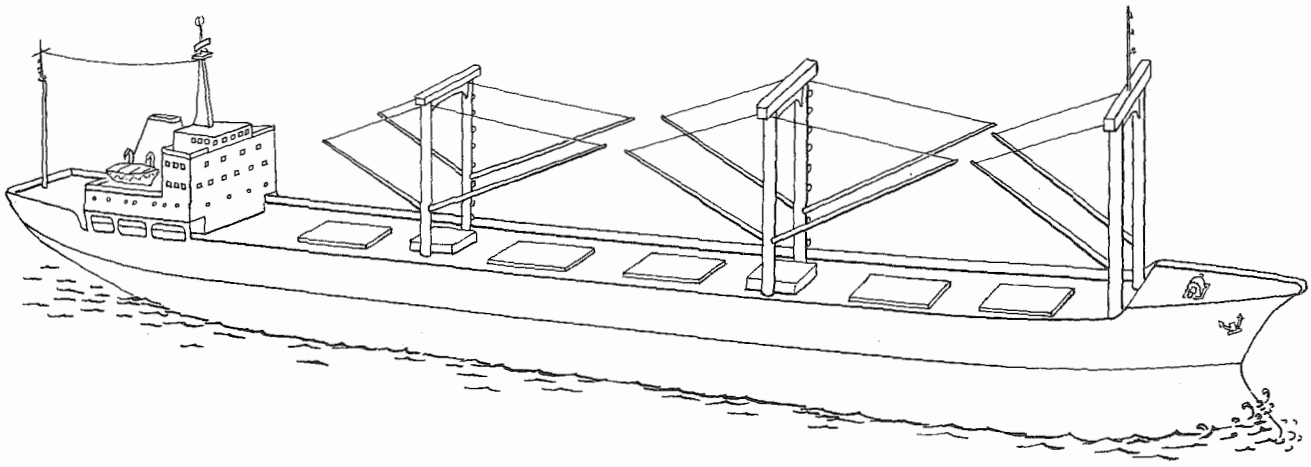
These vessels carry two purse seiners on board. They are lowered when the vessel is approaching a fish school. The purse seiners set the purse seine, pursing and hauling the net. The mothership then comes alongside and the fish is brailed or pumped into the mothership.

In a typical arrangement the engine room and part of the accommodation are placed aft and the bridge with remaining quarters is situated forward.

The purse seiners are placed along the superstructure in the after part of the vessel.

The holds are situated amidships between the two superstructures.

11. FISH CARRIERS



Length over all 182 m
GT 13000

Figure 28 Fish carrier

These are non-fishing vessels used exclusively for fish transport. Fish carriers are generally large vessels with refrigerated holds equipped for transport of fish and fish products. In some instances however small vessels adapted for transport of fish (also in wet condition) are classified in this category.

The general arrangement of large fish carriers is similar to that of other refrigerated ships. The engine room and the superstructure are located aft or amidships.

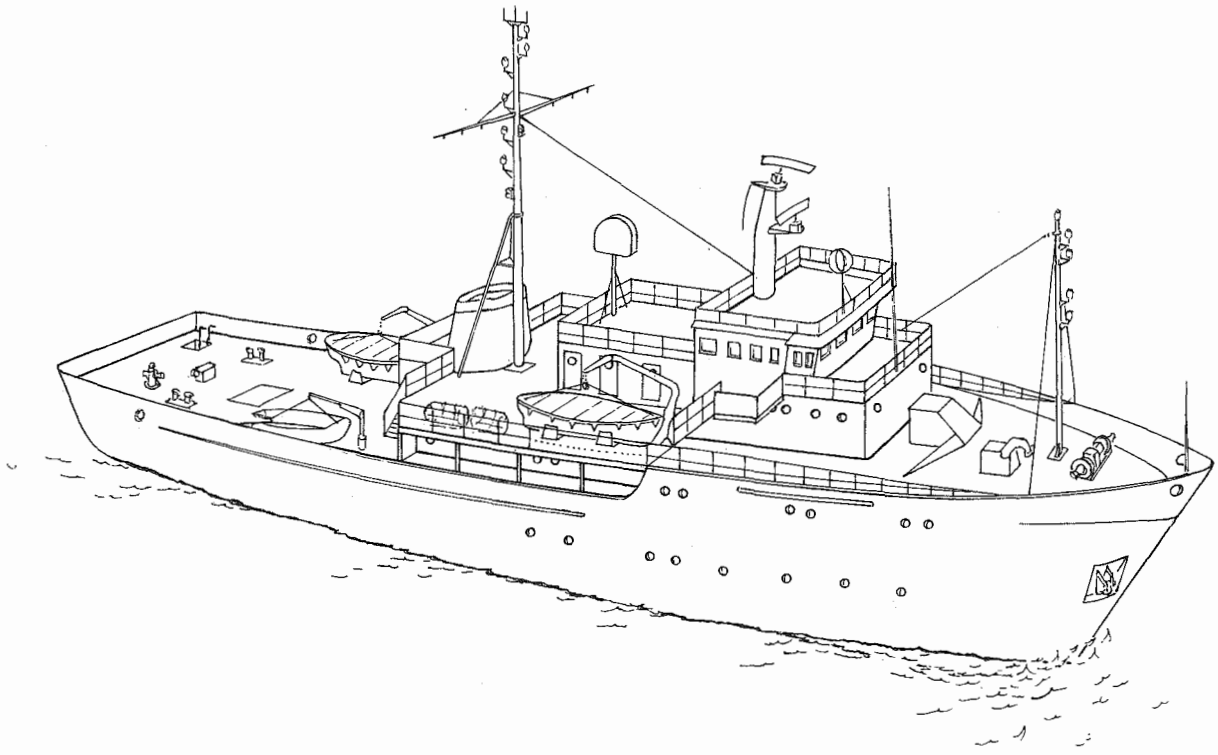
12. HOSPITAL SHIPS

These vessels render medical services to the crews of fishing vessels operating offshore.

The spaces in the large superstructure are suitably arranged as sick-bay, operation theatre, laboratories, etc. Lifting appliances to haul injured and sick people on stretchers aboard are provided.

The general arrangement of hospital ships resembles in outline that of a passenger ship.

13. FISHERY PROTECTION VESSELS



Length over all 71 m

GT 1350

Figure 29 Fishery protection vessel

These vessels perform the function of protection of the fishing grounds and surveillance of fishing vessels operating in territorial waters and in the EEZ area.

The vessels are mostly medium sized for the EEZ area and smaller for coastal duties.

14. FISHERY RESEARCH VESSELS

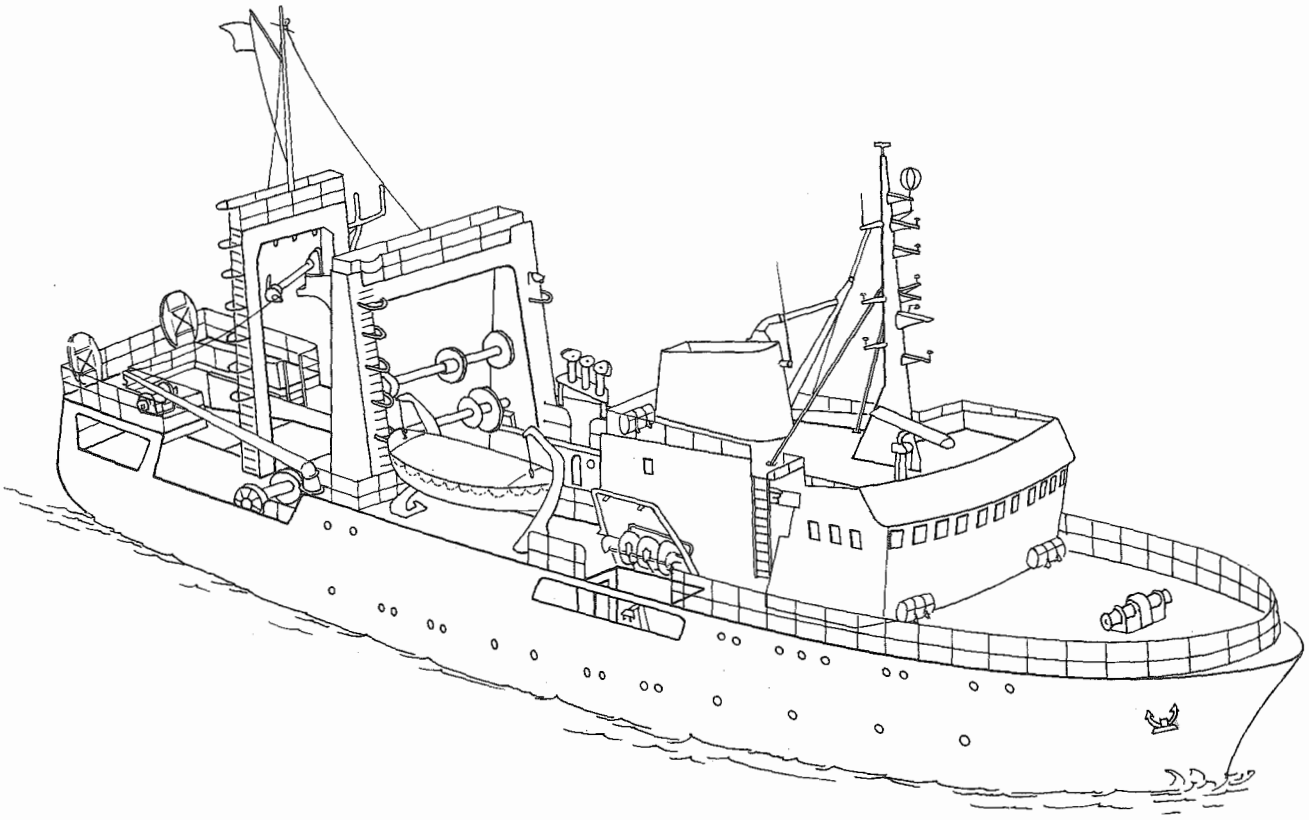


Figure 30 Fishery research vessel

These vessels are mainly engaged in fish stock assessment, experimental fishing using various gear and in fish handling/storage experiments. The size of fishery research vessels depends on the area of operation and on research programmes.

The vessels are usually fitted for the operation of two or more fishing gear. Special winches for taking samples and apparatus for measurements of environmental characteristics are provided.

The accommodation comprises space for laboratories and quarters for scientific staff. Store rooms for instruments and samples are also provided.

15. FISHERY TRAINING VESSELS

These vessels are used for training future fishermen in navigation, seamanship, fishing operations and fish handling.

They are mostly typical fishing vessels with additional accommodation for trainees.

APPENDIX 1

International Standard Statistical Classification of Fishery Vessels (ISSCFV) by Vessel Types

Vessel Categories	Standard Abbreviation	ISSCFV Code
FISHING VESSELS		
TRAWLERS	TO	01.0.0
Side trawlers	TS	01.1.0
wet-fish	TSW	01.1.1
freezer	TSF	01.1.2
Stern trawlers	TT	01.2.0
wet-fish	TTW	01.2.1
freezer	TTF	01.2.2
factory	TTP	01.2.3
Outrigger trawlers	TU	01.3.0
Trawler nei	TOX	01.9.0
SEINERS	SO	02.0.0
Purse seiners	SP	02.1.0
- North American type	SPA	02.1.1
- European type	SPE	02.1.2
Tuna purse seiners	SPT	02.1.3
Seine netters	SN	02.2.0
Seiner nei	SOX	02.9.0
DREDGERS	DO	03.0.0
using boat dredge	DB	03.1.0
using mechanical dredge	DM	03.2.0
dredgers nei	DOX	03.9.0
LIFT NETTERS	NO	04.0.0
using boat operated net	NB	04.1.0
lift netters nei	NOX	04.9.0
GILLNETTERS	GO	05.0.0
TRAP SETTERS	WO	06.0.0
Pot vessels	WOP	06.1.0
Trap setters nei	WOX	06.9.0

Note:

nei is the abbreviation for the phrase "not elsewhere identified"

International Standard Statistical Classification of Fishery Vessels (ISSCFV) by Vessel Types (concluded)

Vessel Categories	Standard Abbreviation	ISSCFV Code
LINERS	LO	07.0.0
Handliners	LH	07.1.0
Longliners	LL	07.2.0
Tuna longliners	LLT	07.2.1
Pole and line vessels	LP	07.3.0
Japanese type	LPJ	07.3.1
American type	LPA	07.3.2
Trollers	LT	07.4.0
Liners nei	LOX	07.9.0
VESSELS USING PUMPS FOR FISHING	PO	08.0.0
MULTIPURPOSE VESSELS	MO	09.0.0
Seiner-handliners	MSN	09.1.0
Trawler-purse seiners	MTS	09.2.0
Trawler-drifters	MTG	09.3.0
Multipurpose vessels nei	MOX	09.9.0
RECREATIONAL FISHING VESSELS	RO	10.0.0
FISHING VESSELS NOT SPECIFIED	FX	49.0.0
NON-FISHING VESSELS		
MOTHERSHIPS	HO	11.0.0.
Salted-fish motherships	HSS	11.1.0
Factory motherships	HSF	11.2.0
Tuna motherships	HST	11.3.0
Motherships for two-boat purse seining	HSP	11.4.0
Motherships nei	HOX	11.9.0
FISH CARRIERS	FO	12.0.0
HOSPITAL SHIPS	KO	13.0.0
PROTECTION AND SURVEY VESSELS	BO	14.0.0
FISHERY RESEARCH VESSELS	ZO	15.0.0
FISHERY TRAINING VESSELS	CO	16.0.0
NON-FISHING VESSELS nei	VOX	99.0.0

Note:

nei is the abbreviation for the phrase "not elsewhere identified"

APPENDIX 2

Examples of Fishery Vessels - Technical Drawings

Drawing 1 Small stern trawler

Drawing 2 Medium sized shelter deck stern trawler

Drawing 3 Factory trawler

Drawing 4 Outrigger trawler

Drawing 5 North-American type purse seiner

Drawing 6 European type purse seiner

Drawing 7 Tuna purse seiner

Drawing 8 Seine netter - Japanese type

Drawing 9 Pot fishing vessel

Drawing 10 Longliner

Drawing 11 Tuna longliner

Drawing 12 Pole and line vessel - Japanese type

Drawing 13 Pole and line vessel - American type

Drawing 14 Troller

Drawing 15 Trawler - purse seiner

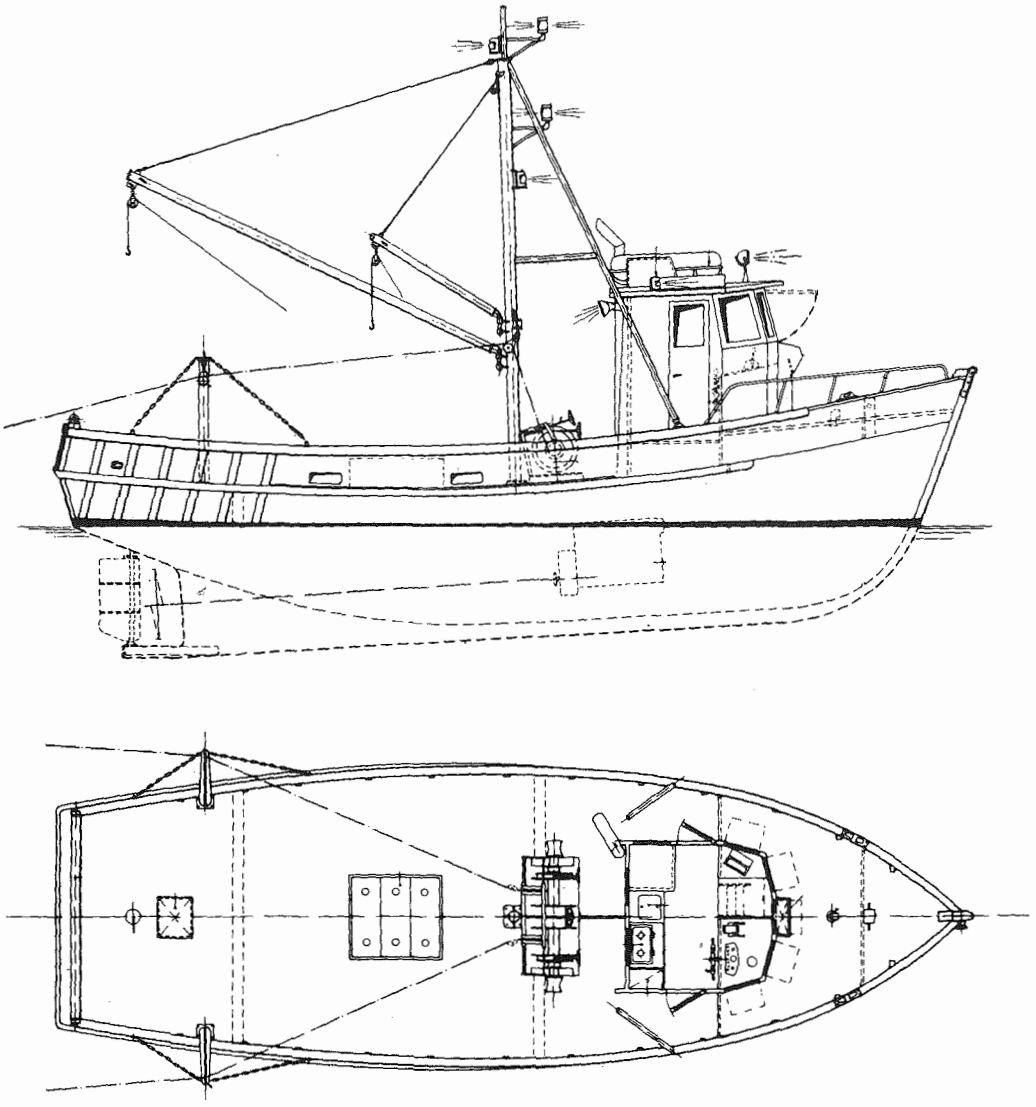
Drawing 16 Fishery research vessel

Length over all	13.00 m
Breadth	4.34 m
Depth	1.96 m
Speed	8 knots
Crew	4+6

Hull material : wood

Main fishing equipment :

One double drum winch with warping heads. Two gallows. Mast and derrick.



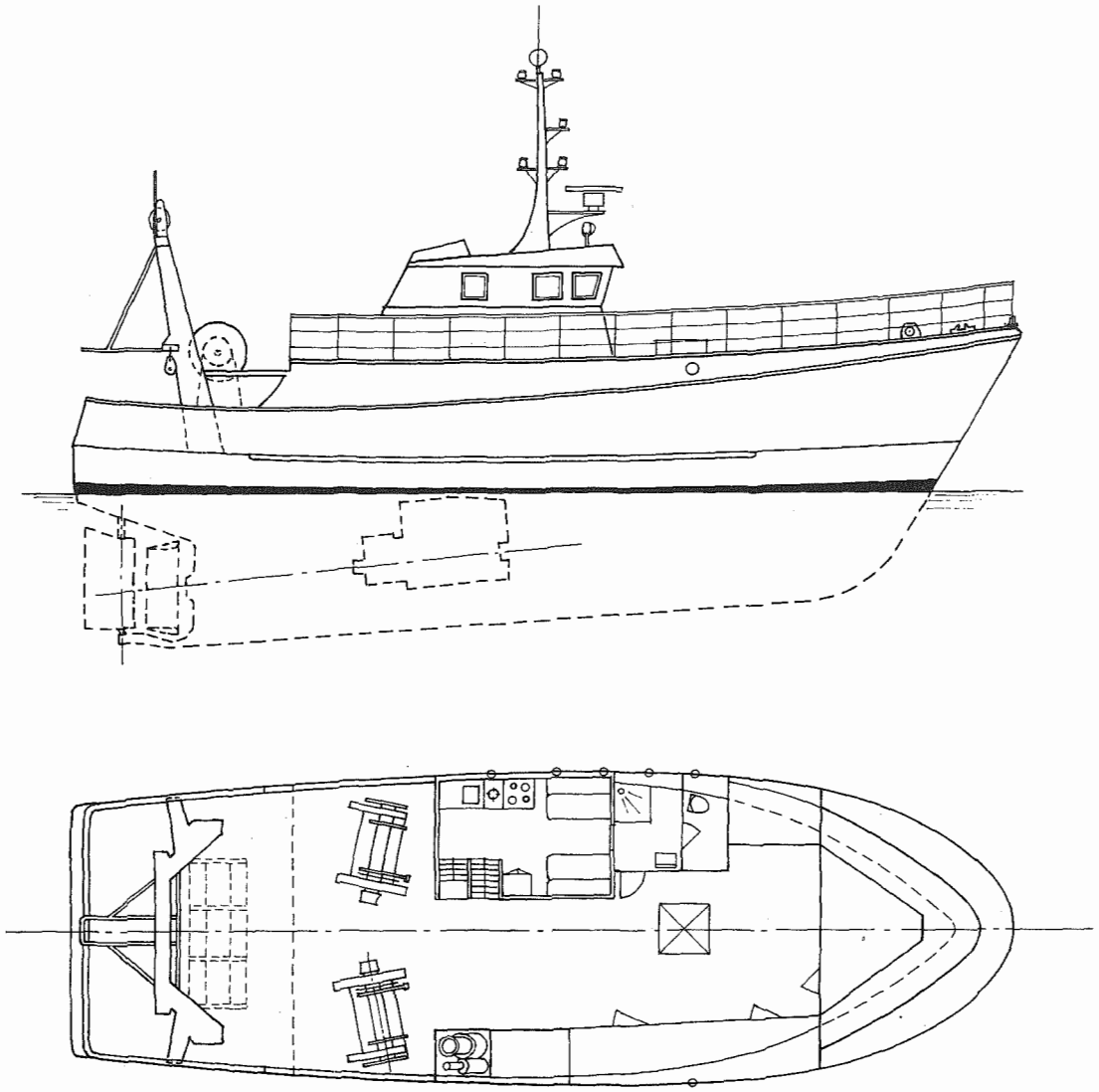
Drawing 1 Small stern trawler

Length over all	20.00 m
Breadth	6.50 m
Depth	3.30 m
Speed	9.00 knots
Crew	7

Hull material: steel

Main fishing equipment:

Split trawl winch.
Trawl drum.
Gantry.



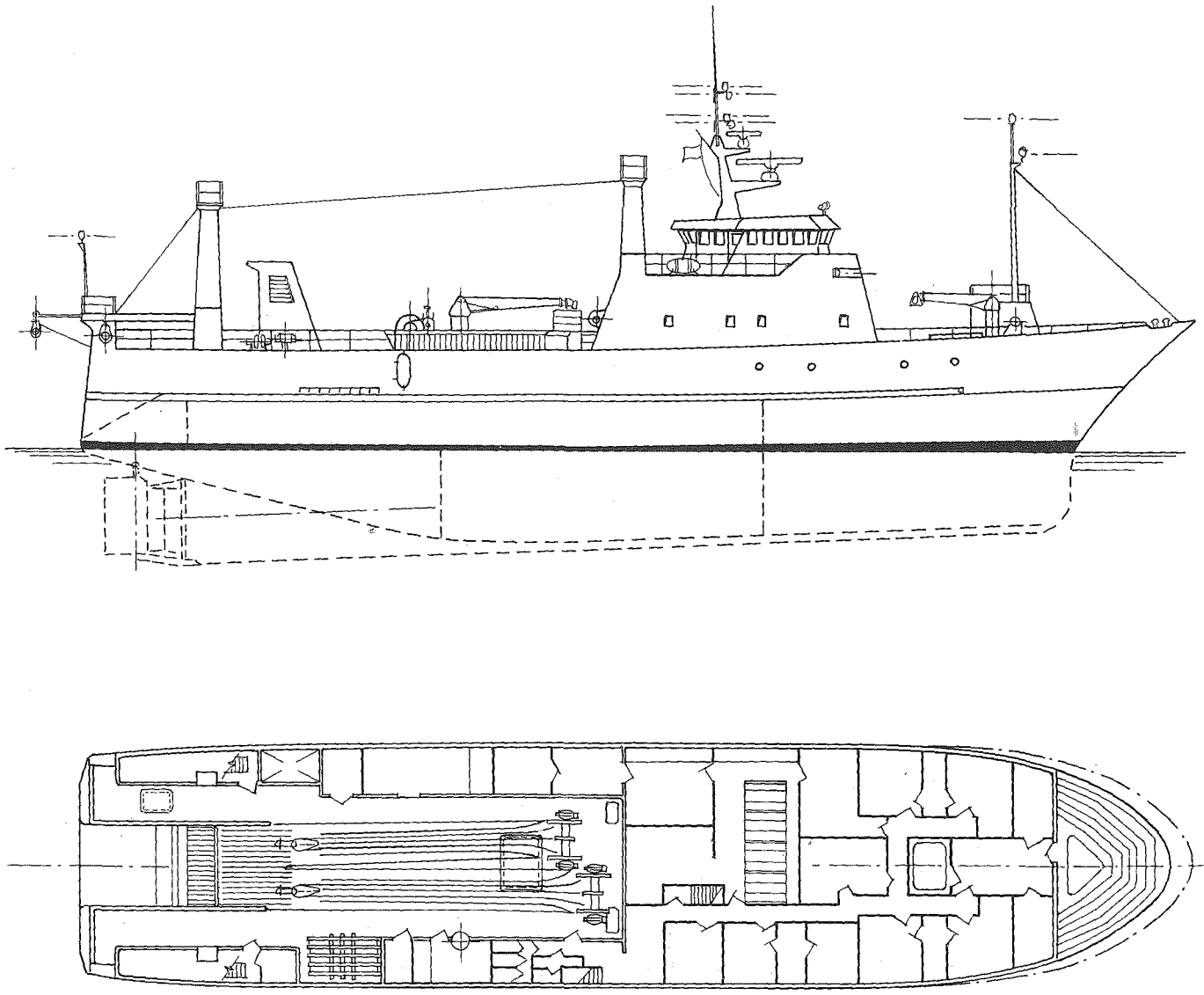
Drawing 2 Medium sized shelter deck stern trawler

Length over all	61.00	m
Breadth	13.30	m
Depth	8.30	m
Draught	5.50	m
Speed	13.00	knots
Crew	40	
GT	1050	

Hull material : steel

Main fishing equipment:

Stern gantry. Two trawl winches.
Stern ramp. Main winches
16 t capacity.
Processing plant.
Plate freezers.
Refrigerated holds.
Cranes.



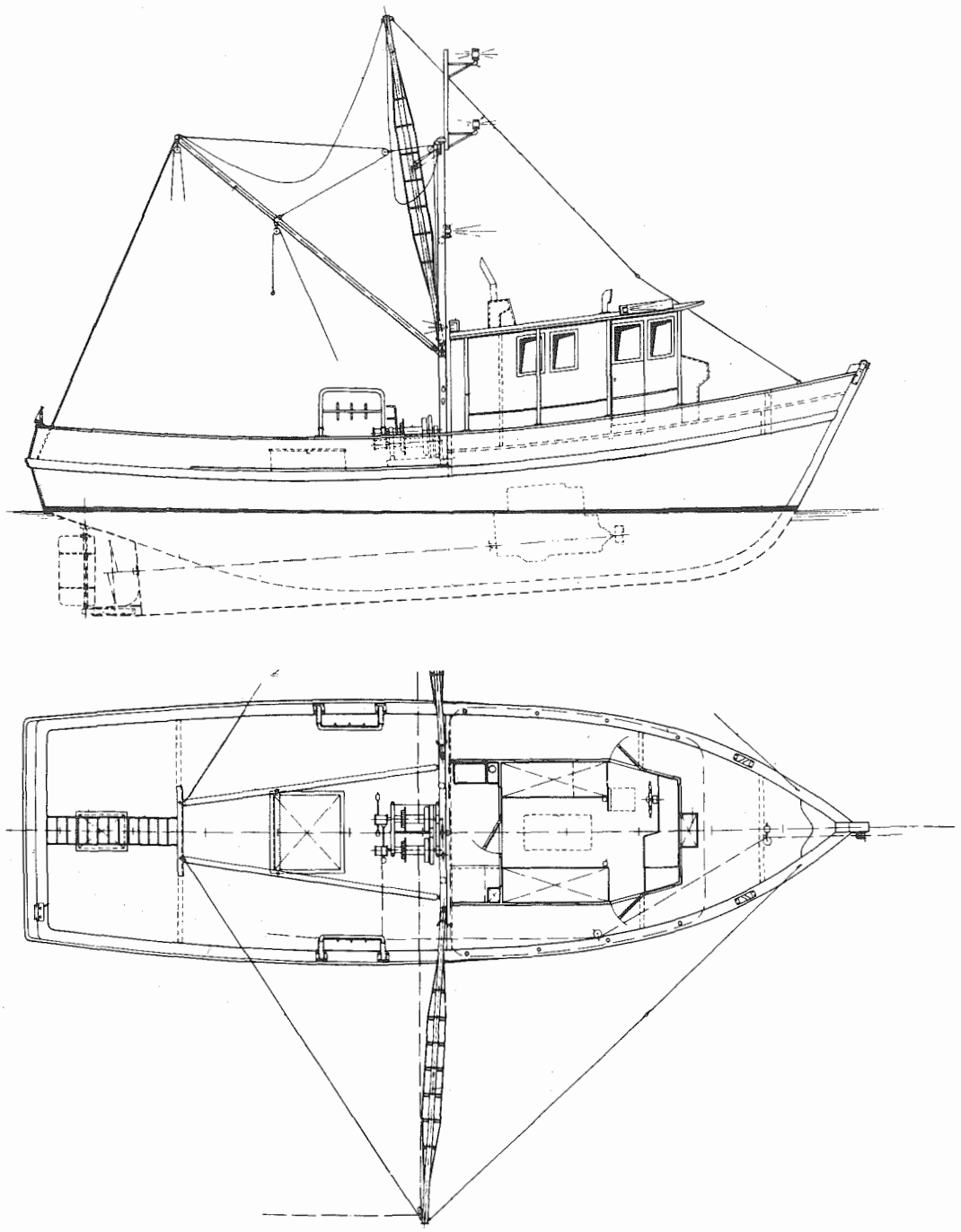
Drawing 3 Factory trawler

Length over all	15.09 m
Breadth	4.57 m
Depth	2.08 m
Speed	7 knots
Crew	6+8

Hull material : wood

Main fishing equipment :

Two outriggers. One double drum winch with warping heads. Mast and derrick.



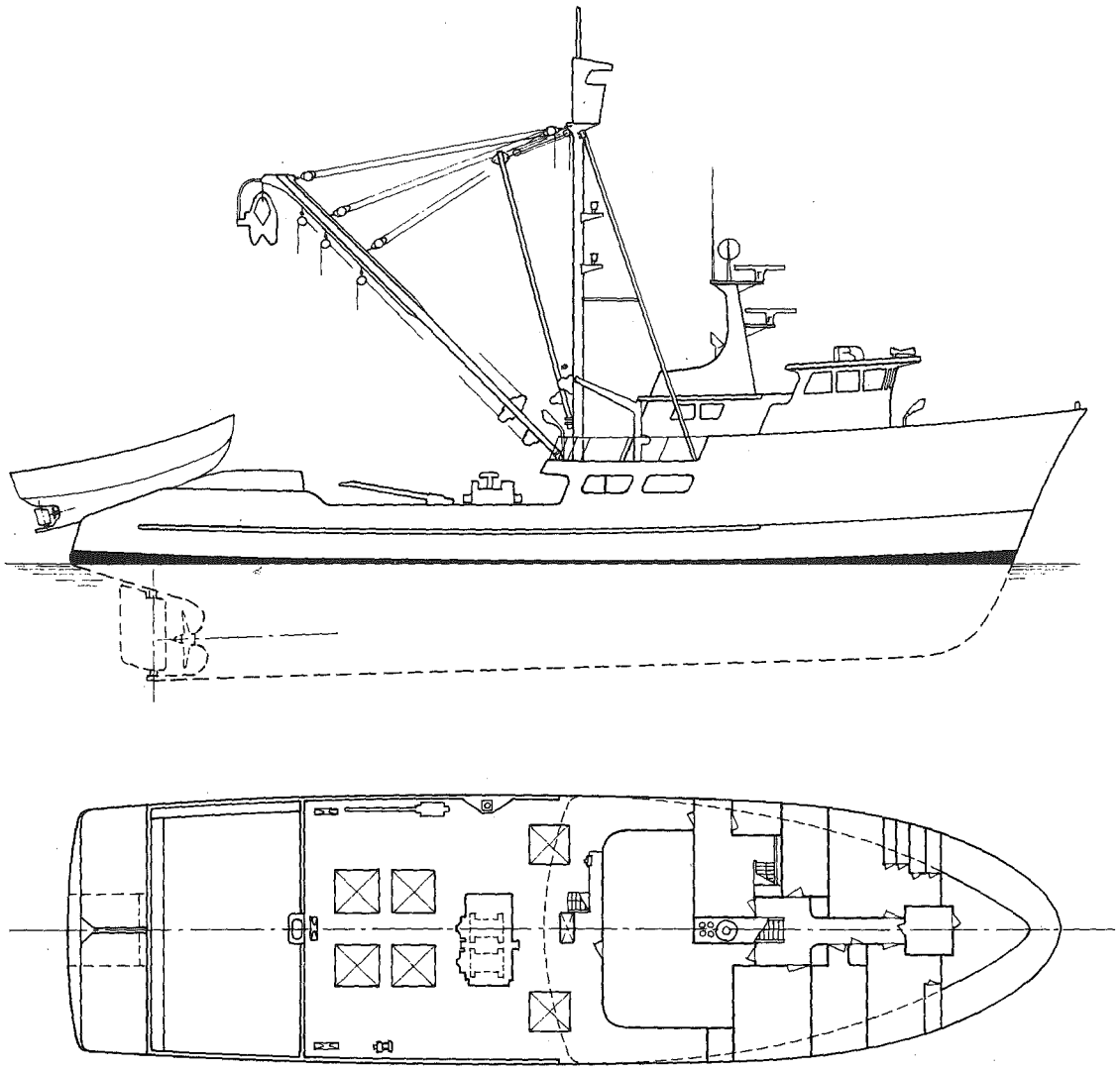
Drawing 4 Outrigger trawler

Length over all	36.00 m
Breadth	9.30 m
Depth	4.60 m

Hull material: steel

Main fishing equipment:

Purse seine winch and davit
Power block
Skiff



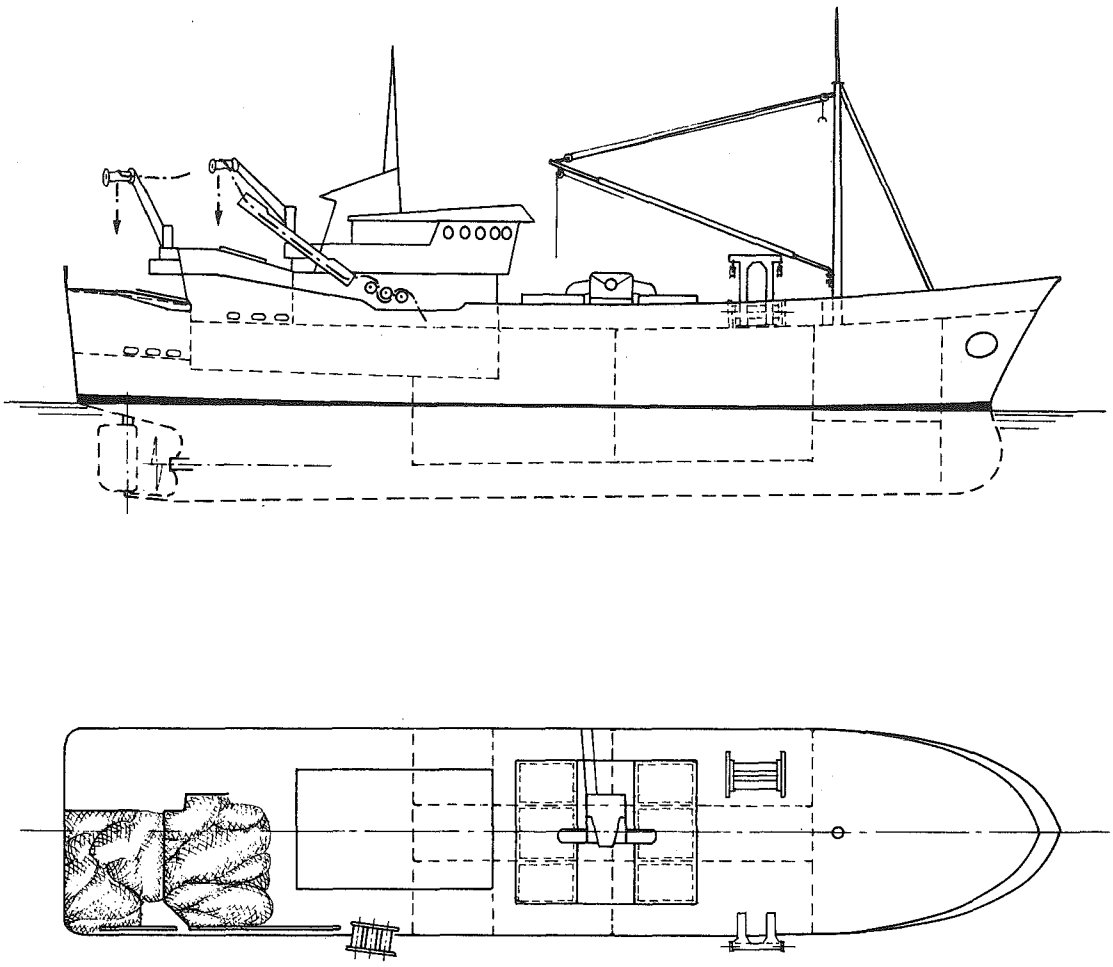
Drawing 5 North-American type purse seiner

Length over all	40.00 m
Breadth	8.40 m
Depth	6.40 m
Crew	10

Hull material : steel

Main fishing equipment :

Purse seine winch, purse davit, triplex power block, two net transport reels, fish pump.



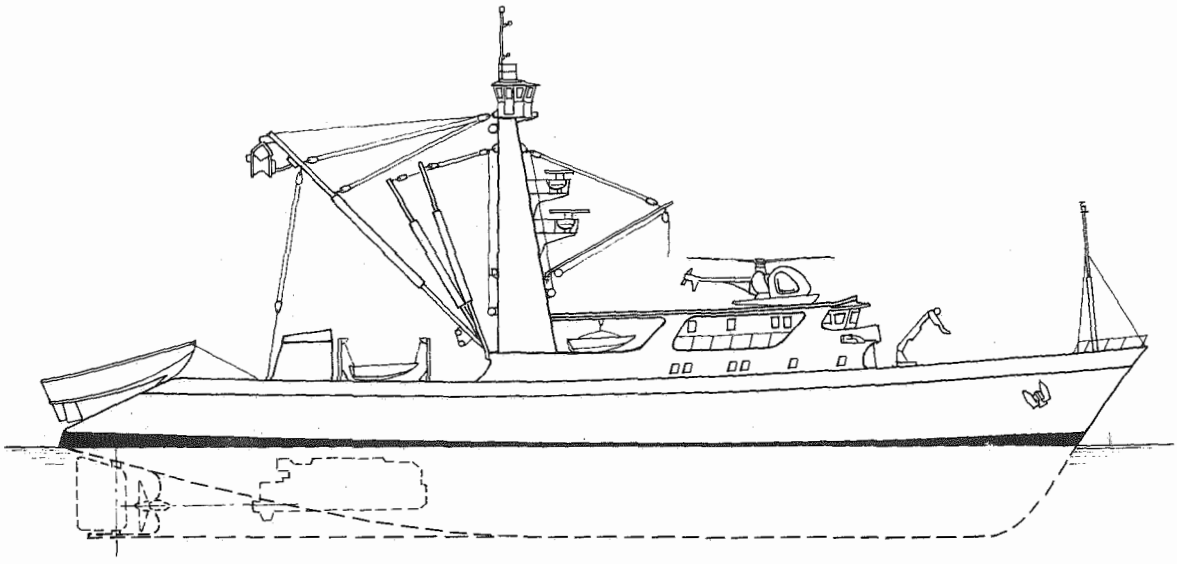
Drawing 6 European type purse seiner

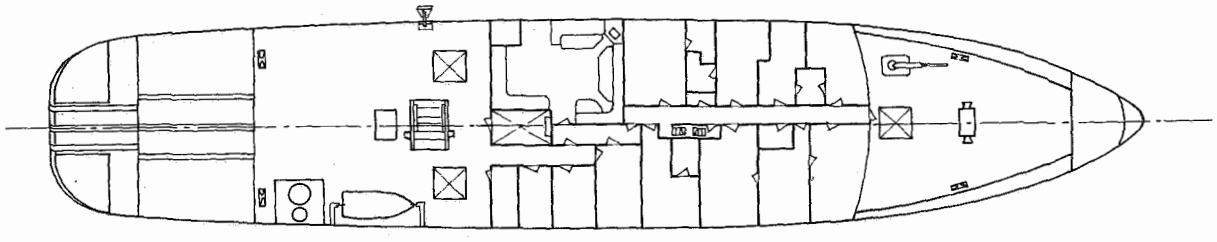
Length over all	68.00 m
Breadth	12.80 m
Depth	8.40 m
Speed	16.00 knots
Crew	22
GT	1400

Hull material : steel

Main fishing equipment:

Purse seine winch.
Power block.
Mast and derrick winches.
Tuna processing plant.
Refrigerated holds.





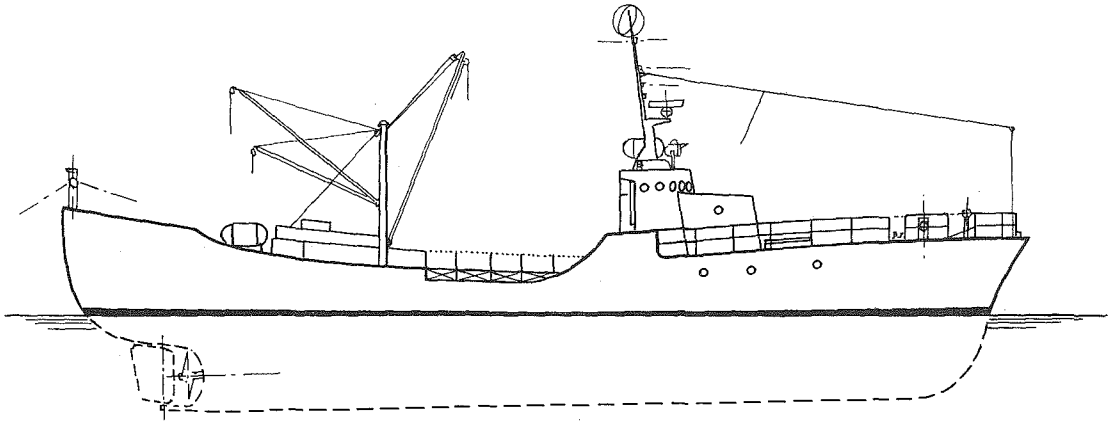
Drawing 7 Tuna purse seiner

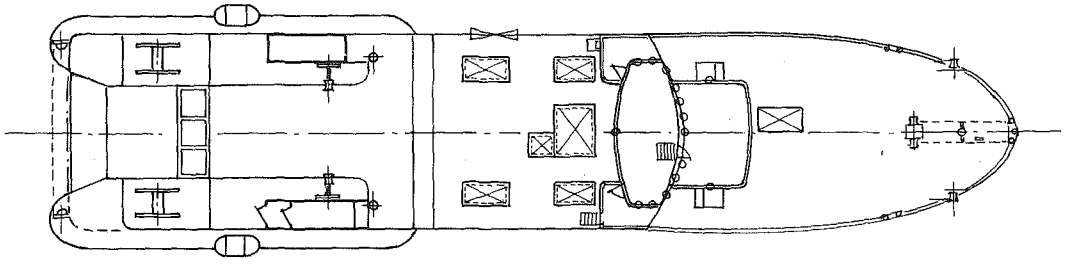
Length over all	30.65 m
Breadth	6.10 m
Depth	2.50 m
Draught	2.30 m
Speed	11.5 knots
Crew	8
GT	96

Hull material : steel

Main fishing equipment :

Stern ramp. Two warping winches each 2.5 t capacity.
Mast and derrick.
Pre caoling installation.
Refrigerated holds.





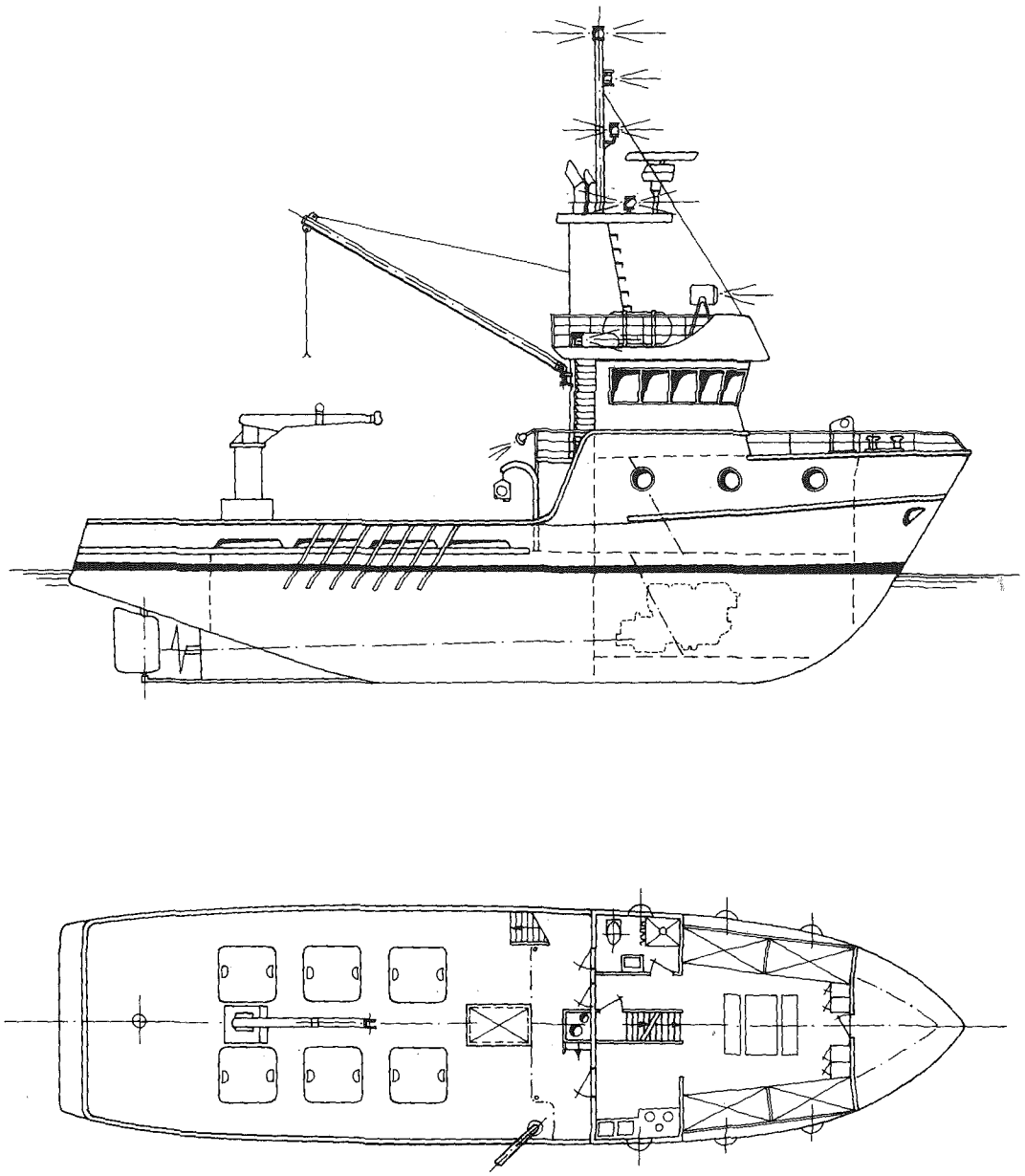
Drawing 8 Seine netter - Japanese type

Length over all	21.50 m
Breadth	5.70 m
Depth	3.20 m
Speed	12 knots
Crew	8

Hull material: steel

Main fishing equipment:

One rotary crane.
One auxiliary derrick.
One davit.

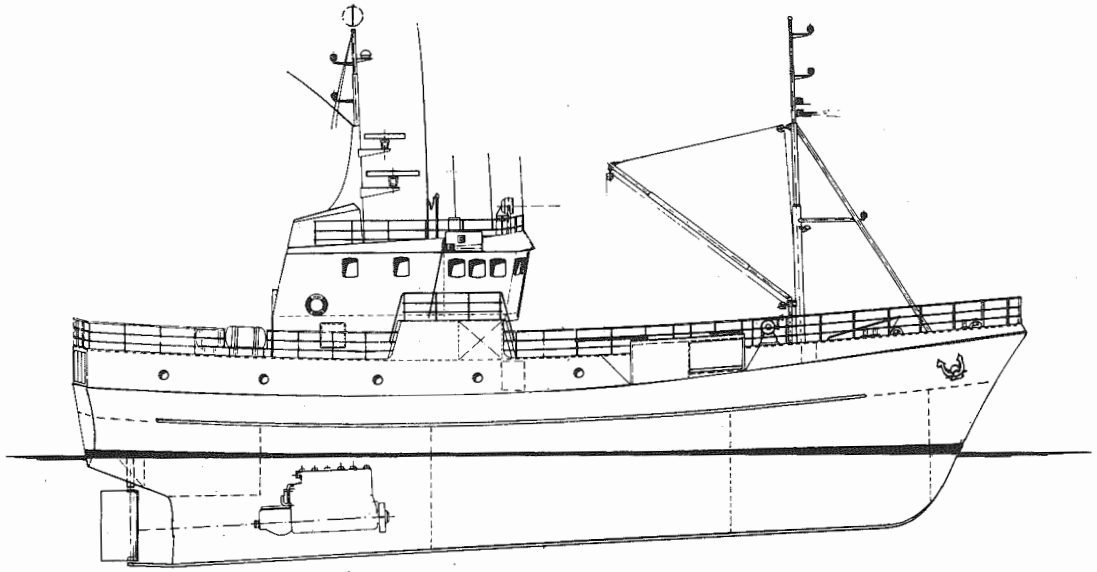


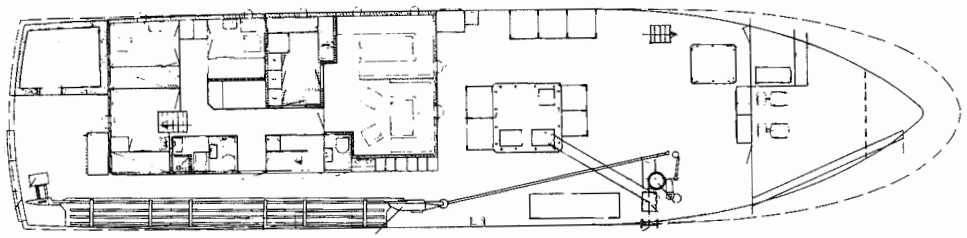
Drawing 9 Pot fishing vessel

Length over all	33.50 m
Breadth	7.60 m
Depth	4.20 m

Hull material: steel

Main fishing equipment:
Line hauler.
Shooting system.





Drawing 10 Longliner

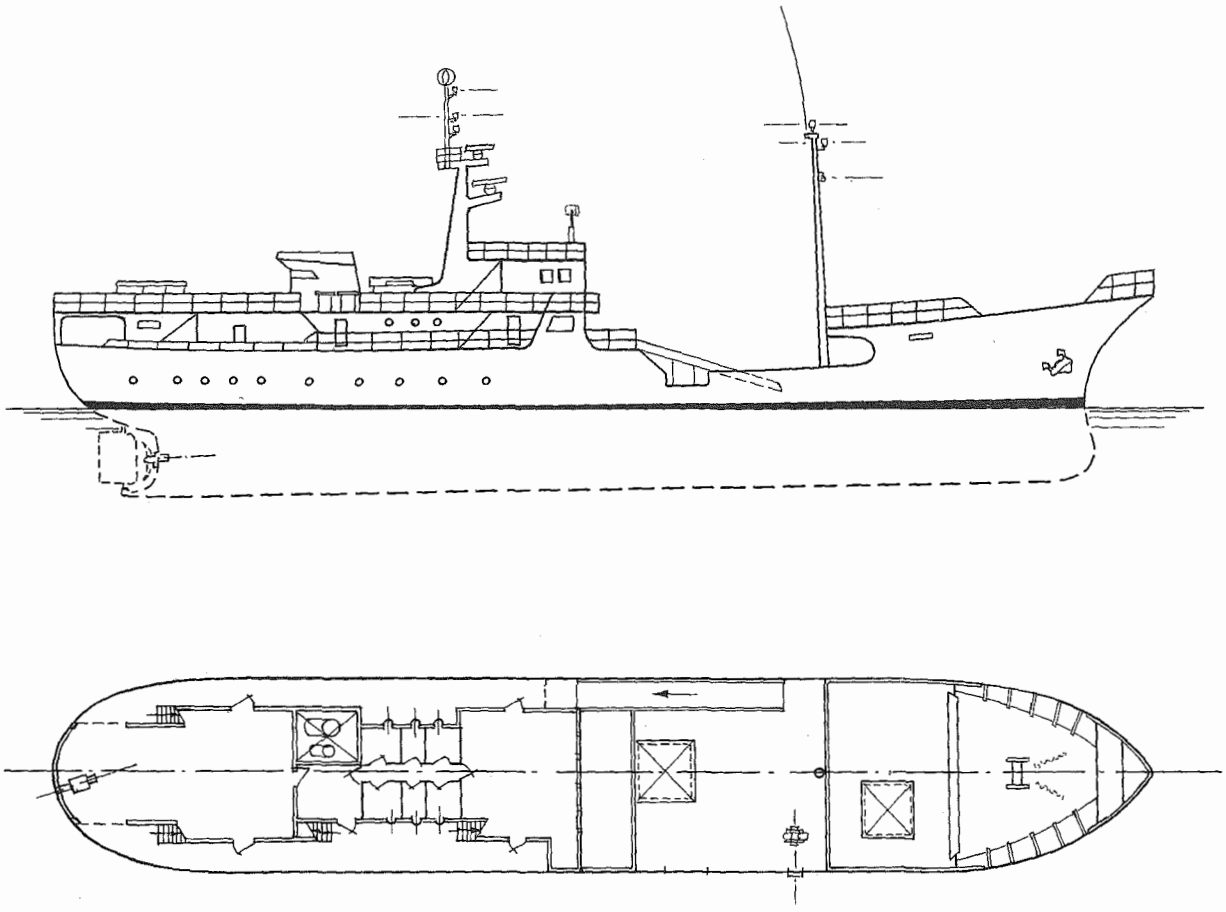
Length over all	66.00 m
Breadth	11.50 m
Depth	6.00 m
Crew	25-30
GT	1300

Hull material: stell

Main fishing equipment:

Freezing and refrigerating tankes.

Hydraulic line hauler.



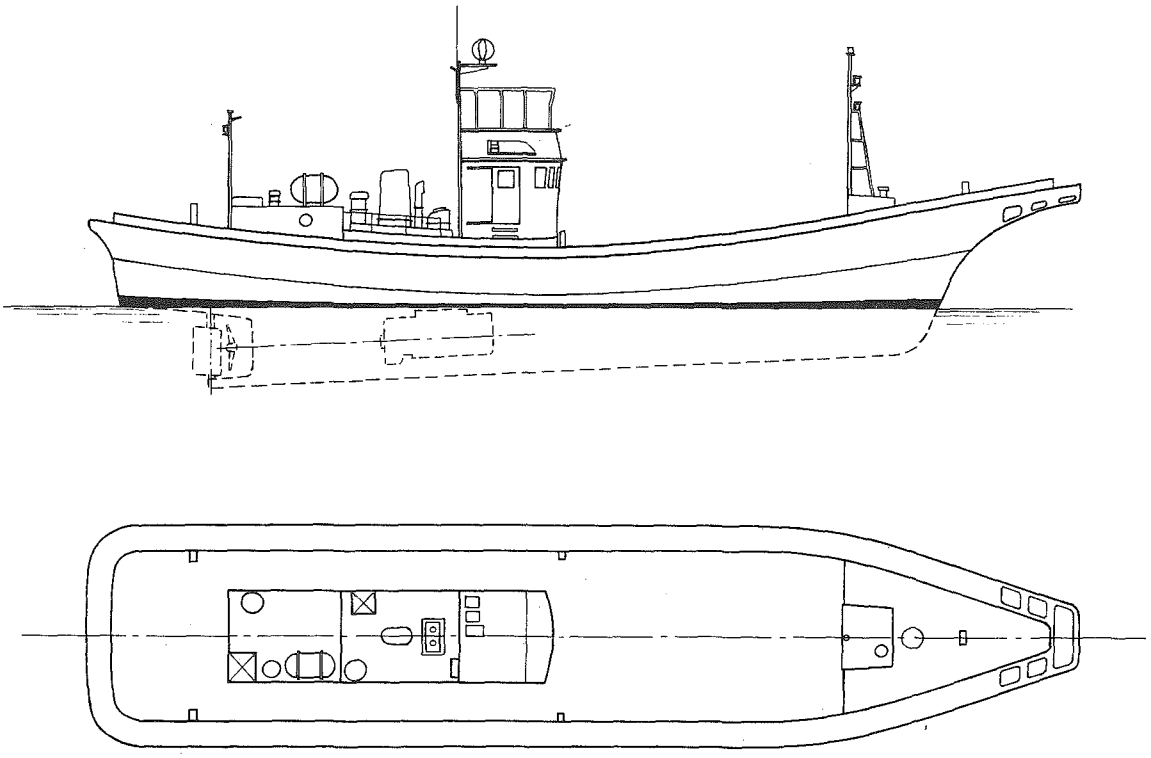
Drawing 11 Tuna longliner

Length over all	21.55 m
Breadth	3.60 m
Depth	1.45 m
Draught	1.35 m
Speed	9.00 knots
Crew	9

Main fishing equipment:

Poles, lines and hooks.
Platforms for fishermen.
Bait tanks.

Hull material : wood or FRP



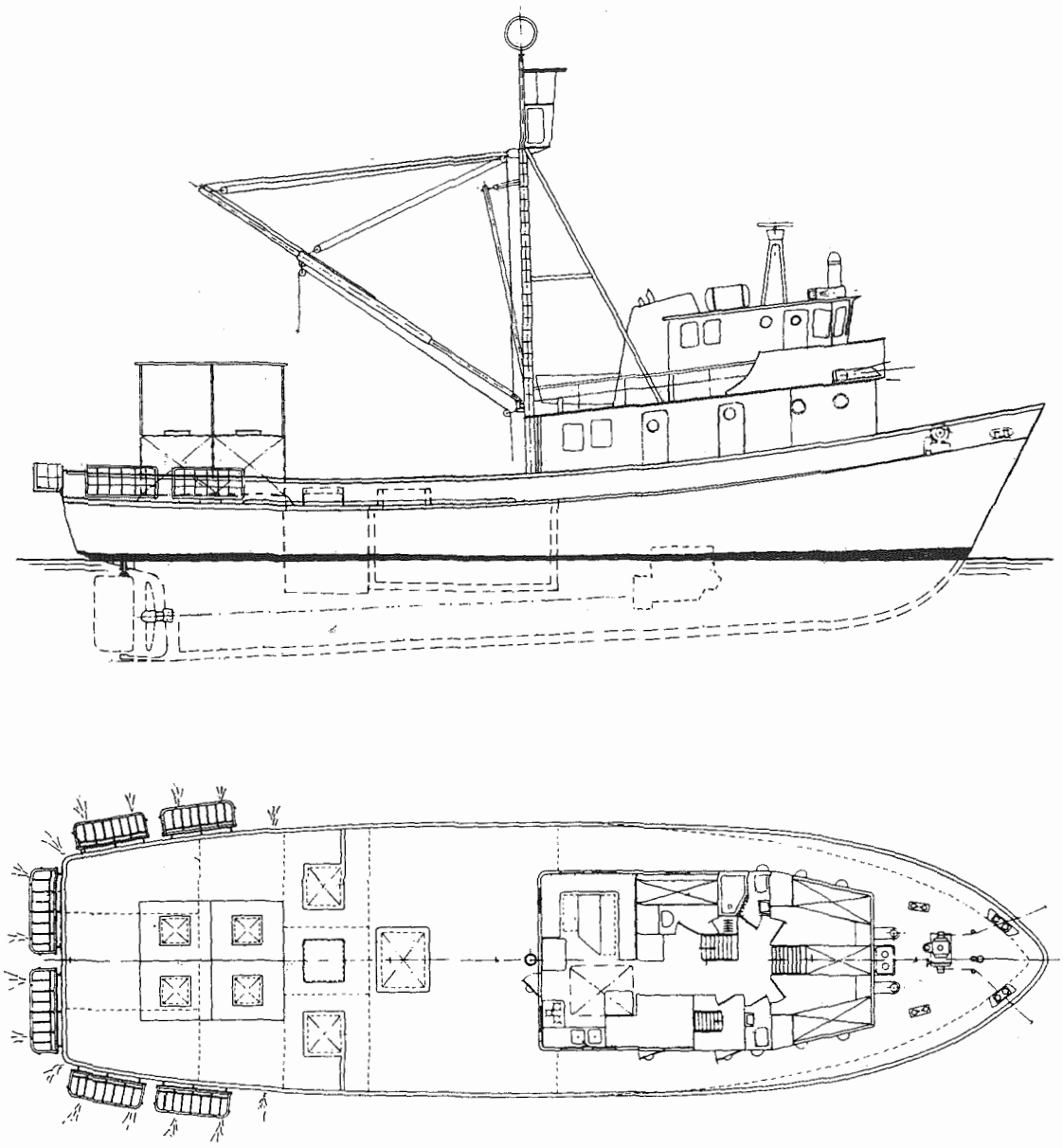
Drawing 12 Pole and line vessel - Japanese type

Length over all	28.00 m
Breadth	7.10 m
Depth	3.80 m
Draught	2.60 m
Speed	9 knots
Crew	16
GT	250

Hull material : steel

Main fishing equipment :

Poles, lines and hooks.
Platforms for fishermen.
Tanks for storing the bait.
Mast and derrick.
Refrigerated holds.



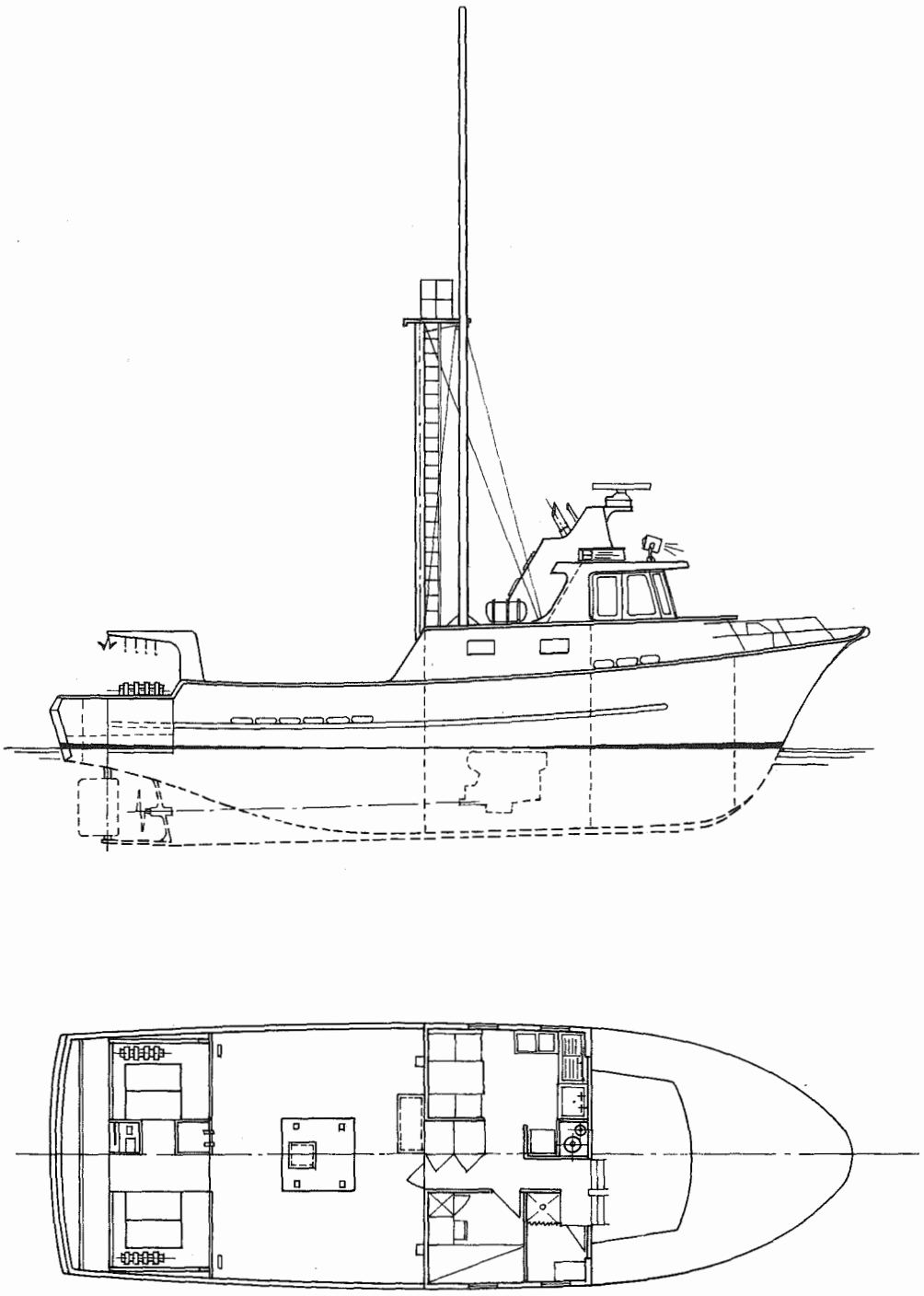
Drawing 13 Pole and line vessel - American type

Length over all 16.80 m
Breadth 5.50 m
Depth 2.40 m
Engine 250 hp

Hull material : steel

Main fishing equipment :

Two trolling gurdies, booms and rigging.



Drawing 14 Troller

APPENDIX 3

Approximate Relation between Gross Tonnage Number (GT) and Length Overall of Fishery Vessels

According to the International Convention on Tonnage Measurement of Ships, 1969, which came into force on 18 July 1982, the gross tonnage (GT) of a vessel is determined by the following formula:

$$GT = K_1 \times V$$

where: V = total volume of all enclosed spaces of the vessel in cubic metres

$$K_1 = 0.2 + 0.02 \log_{10} V$$

In order to find approximate mean values of GT related to vessel's length overall a graph of GT measurements of some existing fishery vessels is included. As GT and length are not directly related, the graph should only be used as a guide. The actual GT value of a specific vessel can deviate as much as 20% from the value obtained from the graph (in particular cases, especially for small boats even more). It also must be considered that before the entering into force of the International Convention on Tonnage Measurement of Ships, the gross tonnage was obtained using national rules, which often gave different values for the same vessel. The International Convention does not apply to vessels under 24 m in length overall, and due to widely varying boat types in the smaller range any attempt to relate GT to length is not advisable.

APPENDIX 3

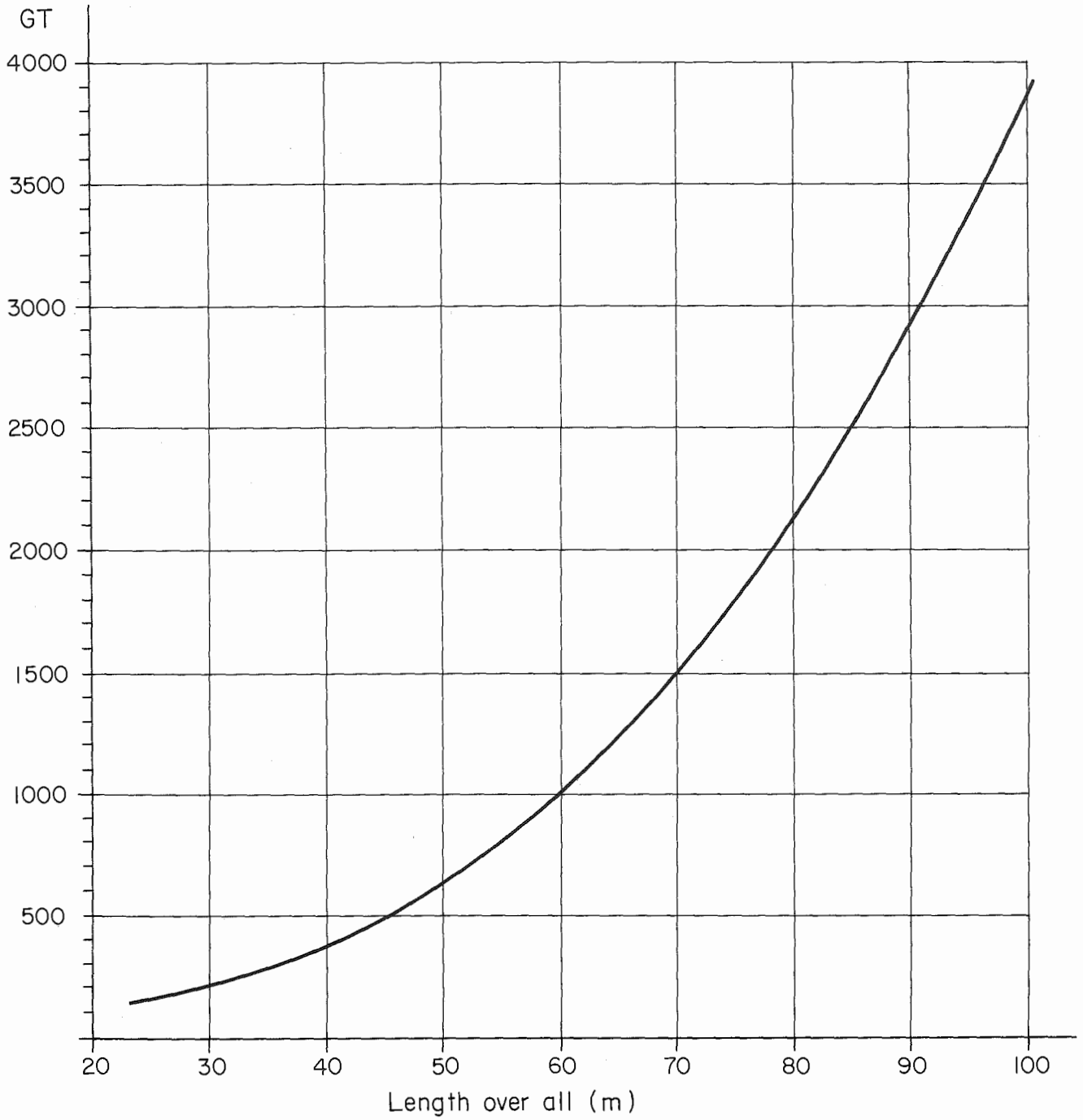


Table 1: Relationship between Gross Tonnage (GT) and overall length of Fishery Vessels over 24 m

APPENDIX 4

FISHERY VESSEL OPERATION AREAS

TYPE OF VESSEL	SEA FISHERIES								INLAND FISHERIES	
	HIGH SEA		OPEN SEA (OFFSHORE)		EEZ AREAS		COASTAL (INSHORE)			
	Size	Type of Fishery	Size	Type of Fishery	Size	Type of Fishery	Size	Type of Fishery	Size	Type of Fishery
TRAWLERS										
Side trawlers										
- wet-fish			M/L	IN	M	IN	S	AR, SB	S	AR, SB
- freezer	L	IN	M/L	IN	M	IN				
Stern trawlers										
- wet-fish			M/L	IN	M	IN	S	AR, SB	S	AR, SB
- freezer	L	IN	M/L	IN	M	IN				
- factory	L	IN	L	IN	L	IN				
Outrigger trawlers					M	IN	S	AR		
SEINERS										
Purse seiners										
- North American type	L	IN	M	IN	M	IN	S	IN		
- European type			M	IN	M	IN	S	IN		
Tuna purse seiners	L	IN	M/L	IN	M	IN				
Seine netters			M	IN	M	IN	S	IN		
Seiners other							S	AR, SB	S	AR, SB
DREDGERS										
- using boat dredge							S	AR, SB	S	AR, SB
- using mechanical dredge					M	IN				
LINERS										
Handliners							S	AR, SB	S	AR, SB
Longliners	L	IN	M/L	IN	S/M	IN	S	IN, AR		
Tuna longliners	L	IN	M	IN	S/M	IN				
Pole and line vessels			M	IN	S	IN	S	IN, AR		
- Japanese type										
- American type										
Trollers					S	IN, AR	S	IN, AR	S	AR
VESSELS USING PUMPS FOR FISHING					S/M	IN	S	IN		
MULTI-PURPOSE VESSELS										
Seiner-handliners							S	AR, SB	S	AR, SB
Trawler-purse seiners			M	IN	S	AR, IN	S	AR		
Trawler-drifters			M	IN	S/M	IN				
LIFT NETTERS										
- using one boat operated net			M	IN	S	IN, AR	S	AR. IN		
GILLNETTERS			M/L	IN	S	IN, AR	S	AR, SB	S	AR, SB
TRAP SETTERS							S	AR, SB	S	AR, SB
Pot vessels					S/M	IN, AR	S	AR, SB	S	AR, SB
MOTHERSHIPS										
Salted-fish motherships	L	IN	L	IN						
Factory motherships	L	IN								
Tuna motherships	L	IN	L	IN						
Motherships for two-boat purse seining	L	IN	L/M	IN						
FISH CARRIERS	L	IN								
HOSPITAL SHIPS	L									
PROTECTION AND SURVEY VESSELS					M		M/S			
FISHERY RESEARCH VESSELS	L		L/M		M		S/M			
FISHERY TRAINING VESSELS	L		L/M		M		S/M			

Note:

Data reflect generally followed practice, excluding exceptional cases

Explanation of Symbols:

Size of vessels:
"L" - Large
"M" - Medium Sized
"S" - Small

Type of Fisheries:
"SB" - Subsistance
"AR" - Artisanal
"IN" - Industrial and/or Semi-Industrial

APPENDIX 4 (cont'd)

Type of Fisheries

The type of fisheries set out in Appendix 4 can be defined as follows:

Subsistence Fisheries means:

Catching fish from small vessels (or from the beach) for the purpose of providing food for the family.

Artisanal Fisheries means:

Catching fish from small vessels, with or without partly mechanized means of setting and hauling in of the fishing gear for the purpose of providing food for the local community and of selling (or exchanging for other goods) the surplus on the market.

Industrial Fisheries means:

(a) Catching fish from large and medium sized vessels fitted out with mechanized methods of operating the fishing gear and installations for preservation of fish on board;

(b) Processing of the catch either in land base or on board - in which case the vessels are provided with appropriate processing installations, and

(c) Distribution the fish products around the country and abroad using mechanized means of transportation adapted for the purpose of fish and fish products transportation.

All these activities are generally organized for the financial benefit of the companies or organizations operating the fishing vessels, processing plants land transport facilites.

Semi-Industrial Fisheries means:

(a) Catching fish from small and/or medium sized vessels fitted out with mechanized methods of operating the fishing gear;

(b) Processing the catch in land bases, and

(c) Distributing the fish and fish products around a limited area, and in exceptional cases only for export.

These activities are aimed at the financial benefit of the companies or organizations operating the fishing vessels, processing plants and transport facilites.

Sources of Illustrations

Cove-Dixon and Co. Ltd., Naval Architects, West Vancouver, Canada

Fyson, J.F., 1980 Fishing boat designs: 3. Small trawlers. FAO Fish.Tech. Pap., (188):32 p. Issued also in French and Spanish

_____, Small fishing vessel design. Farnham, Surrey, Fishing News Books Ltd., for FAO (in preparation)

Gulbrandsen, Ø., 1974 Fishing boat designs: 2. V-bottom boats. FAO Fish.Tech.Pap., (134):22 p. Issued also in French and Spanish

Marine Construction and Design Co., n.d. Marco products catalog for naval architects, shipyards and operators of commercial vessels. Seattle, Washington, Marco Seattle, pag. var.

O. Mustad and Sons A/S., n.d. Mustad autoline system. Oslo, O. Mustad and Son A/S

Noel, H.S. and M. Ben-Yami, 1980 Pair trawling with small boats. FAO Training Ser., (1):77 p. Issued also in French and Spanish

Traung, J.-O. (ed.) 1955 Fishing boats of the world. London, Fishing News Books, Ltd., for FAO, 579 p.

_____, 1960 Fishing boats of the world:2. London, Fishing News Books Ltd., for FAO, 781 p.

_____, 1967 Fishing boats of the world:3. London, Fishing News Books Ltd., for FAO, 648 p.

Foto-Tipo-lito SAGRAF - Napoli

M-41
ISBN 92-5-102319-2