SEA FISH INDUSTRY AUTHORITY
Seafish Technology

STATIC FISHING NETS
EXPERIMENTS TO REDUCE UNWANTED BY CATCH AND BOTTOM DEBRIS

Internal Report No. 1398

October 1988/
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1 INTRODUCTION

In August 1987, Seafish carried out sea trials to assess the efficiency of trammel nets constructed of a number of alternative materials (Internal Report No. 1341 refers).

One of the main objectives of the work was to assess the effectiveness of monofilament nylon used in the construction of trammel nets with the aim of reducing net clearing time by making it more easy to remove crabs and bottom debris.

On certain fishing grounds the presence of immature edible, brown crab can pose considerable net clearing and handling problems. The entanglement of crabs in static gear invariably results in them being "broken-up" in order to remove them from the gear. In some areas this can result in quite considerable crab mortalities. On many occassions, the crab problem can be avoided by changing fishing grounds. This, however can not always be the answer since fishermen will obviously shoot gear on grounds that are holding fish, irrespective of whether large quantities of crabs will be encountered or not.

In order to try and reduce crab mortalities Seafish developed some experimental static net rigs to attempt to reduce crab entry into both gill and trammel nets.

The net specifications used for these trials were similar to those used in the 1987 trials in order to further evaluate the performance of this type of net.

The idea adopted to attempt to reduce crab entry into the gear was to construct basic trammel and gill nets with an inbuilt 'barrier strip' at the base of the net. Two basic types of barrier were used, namely a large monofilament mesh barrier and one in which the footrope was suspended from strops. In order to maintain the barrier strip in an upright (vertical) position in a tideway, the nets were rigged with a three-bridle arrangement. This idea was developed as a result of Flume Tank experimentation.

As in the 1987 trial, the later trials were used to also examine the selectivity of gill and trammel nets. As part of the assessment of selectivity and effectiveness of the gear Seafish decided to examine the affect of colour contrast in static nets. This was incorporated into the 'anti-crab' barrier rigs wherever possible.

Fishing gear suppliers, Hugh Norman Marine Sales Ltd, showed a great deal of interest in the proposed work, particularly with reference to the contrast idea. Mr Tom Norman of the company's North East of England branch offered his assistance to the project. The firm is one of the country's leading suppliers of static fishing gear and as such Mr Norman shows considerable interest in any developments in that field. As an indication of the degree of committment to this type of development, Hugh Norman Marine Sales offered to supply the gear for the construction of the experimental nets. Mr Norman also assisted greatly by offering Seafish the benefit of his considerable knowledge of static net fishing gears.

As in 1987 the vessel chosen for the trials was the Sunderland based M.F.V. OUR WAY skippered by Chris Waterstreet, The trials initially scheduled for 3 weeks in August 1988 were postponed due to poor catch rates being experienced by the charter vessel. An exploratory period of sea trials, on which the first part of this report is based, was conducted between the 5th and 9th September (inclusive) in order to assess the fishing situation.

The initial programme intended for the static net trials (when the trials were first formulated) was to carry them out along the lines of a commercial fishing exercise. However, at the end of the first part of the exercise, the catch rates of target species were too low to establish whether the experimental barrier nets were suffering any reduction in catch rates of target species by nature of their design. It was at this stage that the decision was made to postpone the rest of the trials until catch rates improved. Unfortunately the 1988/89 season proved to be a poor one with catch rates remaining very low.

Local fishermen blamed the unusually warm and clear water conditions, at least in part for the poor fishing in 1988/89, and water temperatures of twice the seasonal norm were commonly recorded. These conditions linked with long periods of strong west and south-westerly gales and the activities of seals on the inshore grounds all added up to poor fishing.

After consultations with local fishermen including the charter skipper, the consensus of opinion was that fishing was unlikely to improve in the near future.

Since the MAFF Commission was only available for the period up to March 1989 it was necessary to restart the trials in February 1989 despite the low catch rates and take advantage of the mild weather which had resulted in continued crab activity. Normally crab movements and activity are greatly reduced in the winter months due to the lower temperatures.

During the time between the end of the first stage of the trials and the restart in February, Skipper Waterstreet purchased a new vessel, the F.V. NIKKI-D (SD46). Full details of the vessel are included in the report, page 6.

The report describes the initial exploratory trials in September 1988 and then goes on to cover the commercial fishing trials carried out in February 1989.

The description of the fishing gear given applies to both trials. In the trials in February 1989 some minor alterations were made to the net sequences but otherwise the fishing gear remained the same for both exercises.

2 VESSEL SPECIFICATIONS

2.1 M.F.V. Our Way - First Stage Trials

Vessel	-	M.F.V. OUR WAY (SD121)
Skipper	-	C. Waterstreet
Crew	-	3
Built	-	Hartlepool 1979 by A & A Marine (G. Cutwell)
Length (OA)	-	36 feet
Material	-	Steel
Engine	-	Ford Diesel - 120 h.p.
Deck Machinery	-	Spencer Carter Conveyer Net Hauler
	-	North Sea Winches 1000kg Trawl Winch
Wheelhouse Equipment	-	Shipmate R.S. 4000 C Navigator
	-	Kelvin Hughes Model 132 Echo Sounder
	-	Hussan Co. V.H.F. Radio Equipment

2.2 M.F.V. Nikki D - Second Stage Trials

Vessel	-	M.F.V. NIKKI-D (SD46) Offshore 105
Skipper	-	C. Waterstreet
Crew	-	3
Built	-	Port Isaac Workboats, Wadebridge, Cornwall, 1988.
Length (OA)	-	34.6ft (10.5m) 9.9m Registered
Beam	-	12ft (3.5m)
Draft	-	3.6ft (0.9m)
Forward Wheelhouse	-	2 berth Accommodation
Material	-	G.R.P.
Engine	-	Iveco 350 h.p. Turbo
Gearbox	-	1.5 : 1
Top Speed	-	20k @ 2000 revs
Propeller	-	22in x 21in x 3 blades
Deck Machinery	-	Spencer Carter Conveyer Net Hauler
	-	2 x Powered Rollers
Wheelhouse Equipment	-	Shipmate R.S. 4000 Navigator
	-	Magnetic Compass
	-	Cetrek 727 Auto Pilot
	-	1 x FUSO LCD Sounder
	-	1 x Royal LCD Sounder
	-	1 x Raytheon V-800 Colour Scope

3 OBJECTIVES AND AIMS OF THE TRIALS

Following the results obtained, and the information gathered from the 1987 trials, it was decided that the 88/89 trials should incorporate a continuation of the assessment of the efficiency of monofilament materials used in the construction of trammel nets and also examine methods of reducing crab entry and entanglement in static nets. For this reason, the nets used during the trials were based on the specifications as used in 1987 (see section describing fishing gear).

In the North East Coast static net fishery the main quarry species are cod and codling. However, valuable by-catches of turbot, monkfish (angler fish), lemon and Dover soles and also lobster are encountered at certain times. These species are encountered on, or very close to the seabed. One of the objectives of this work was to try and develop a net, rigged in such a way as to reduce unwanted crab entry, but at the same time maintain the potential for catching some of the by-catch species.

As previously mentioned, the two systems used were based on the principle of a 'barrier strip' employed to prevent crabs reaching the main body of the net. One system uses a strip consisting of two large meshes (10in or 12in) the other method has the footrope/leadline of the net suspended from a false 'fishing-line' by nylon strops.

From observations in the Flume Tank it was expected that the strop barriers would be most effective in reducing crab entry but would reduce the nets potential for catching the by-catch species. Conversely, the mesh barier would not be as effective as the strops at reducing crab-entry but could still potentially take by-catch species like monk and large flat fish. The aim of this exercise was to try and establish which system would provide the best compromise, bearing in mind the extra time and materials involved in the construction of these types of rigs. (The construction of a net utilising the mesh barrier strip involves more time, effort and material than the strop barrier type).

In order that the barrier strip methods be effective, the nets were rigged with a three-bridle arrangement. The effectiveness of the bridle-rig was monitored throughout the trial.

The colour-contrast aspect was incorporated into the barrier strip principle. Since it was expected that the mesh barrier strips would reduce the net's by-catch, catching potential, it was decided (wherever possible) to rig the net in such a way as to produce a light and dark contrast between the barrier strip and the bottom section of the main body of the net. The idea was to try and establish if the visibility of the net, due to the contrast difference, would make a difference as to which area of the net the fish were caught. The theory is that any fish approaching a wall of net that is relatively clearly visible would take avoiding action and hopefully be caught in the contrasting area of less visible net. To this end, any fish caught in the gear were recorded as being caught in either the upper, middle or lower third of the nets. The same principle applied to the gill nets rigged specifically to monitor the contrast affect (see details of gear).

Other aims of the work included:-

- Assessing the effectiveness of the three-bridle rigs in conjunction with the use of floatation to try and maintain the fishing height of the nets at all states of the tide.

- Comparing the selectivity of the mesh sizes of the experimental nets with those of the control nets and the vessels own gear.

- Making a record of the numbers, size and sex of Brown crab (Cancer pagurus) and common lobster (Homarus gammarus) taken in the experimental and control nets. (Information collected on behalf of MAFF Fisheries Laboratory, Lowestoft).

- Highlighting any handling problems that may arise with respect to the rigging of 'barrier' nets.

4 DESCRIPTION OF FISHING GEAR

All the materials for the construction of the experimental nets were supplied by Tom Norman of Hugh Norman Marine Sales Ltd (Peterlee, Co. Durham).

The following is a description of the net constructions and fleet arrangements for the experimental work. Illustrations describing the gear specifications and net sequences are included in the report and should be examined in conjunction with the text.

For ease of operation, the experimental nets were grouped into three fleets, A B and C. Fleets A and B consisting of six nets each, and fleet C of only four nets. Each fleet contained a mixture of trammel and gill nets. The 'anti-crab' barrier strips were incorporated into both the trammel and gill nets in the same way for comparison. The specifications of the main body of the trammel nets and the gill nets were consistent throughout the fleets, with only the barrier arrangement being varied.

However, for the second stage of the trials some minor alterations were made to the fleet arrangements. These changes came about as a result of some minor problems that were highlighted during the first stage of the work in September 1988.

For the second stage of the operation, fleet C was broken down to consist only of the two nylon contrast nets. The two remaining strop barrier nets were added, onto each of the other two fleets. Hence nets C_1 and C_4 became A_7 and B_7 respectively (C_2 and C_3 were then remarked C_1 and C_2). The resulting arrangement was three fleets, two consisting of seven nets and one of only two nets. In this way all the nets rigged with three bridle arrangements were in the same fleets. There were no combinations of two and three bridle arrangements which had been envisaged to cause possible problems from a handling point of view.

The standard trammel net specification was as follows:-

The inner wall or lint was constructed of 4½in mesh (full mesh) of 0.4mm diameter monofilament P.A. netting, 40 meshes deep. This was hung onto a headline made-up of a No. 6 floatline with a 6mm polypropylene (P.P.) braided backline. The netting was hung with a horizontal hanging coefficient (E) of 0.5. The outer walls or armourings were also constructed of monofilament nylon, in this case 0.57mm diameter in 8in mesh. These walls were 20 meshes deep and hung onto the headline at a coefficient of 0.66. It is the armourings that determine the overall potential fishing height of the net. For this rig a maximum fishing height of about 10ft could be expected.

The bottom edge of the main body of the net was set, using the same hanging coefficients, onto a 'false fishing line' of 6mm diameter P.P. It was between this 'false fishing line' and the leadline, that the barrier strip was inserted.

When constructing the nets with the mesh barrier strips, the barrier meshes were incorporated into the net as part of the normal rigging operation. In other words, during the rigging process the top edge of the barrier mesh strips were 'picked-up' as the bottom edge of the main net was set onto the false fishing line. The bottom edge of the barrier strip was then set onto a No. 3 leadline using the same hanging coefficient, i.e. E = 0.66.

Note:- The No. 6 floatline and No. 3 leadline mentioned in the previous description have the following buoyancy and weight - 4500gms/100m and 7.3kg/100m respectively.

The standard gill net specification used for the experimental nets was as follows:-

Monofilament P.A. netting was used for the nets incorporating the barrier strip arrangement but the nets used to test the affect of the light and dark contrast were constructed of twisted continuous filament nylon (P.A.) in order that the netting could be dyed to form the light and dark contrasting sections.

The monofilament used was 0.4mm diameter in a 4½in mesh size. The nets were 40 meshes deep and set onto No. 6 floatline with 6mm diameter P.P. braided rope. The hanging coefficient was 0.5 for both headrope and bottom edge (false fishing line). At this setting a maximum fishing height of about 13ft could be expected. The footrope again consisted of a No. 3 leadline attached to the false fishing line by way of the barrier strip (either mesh or strop type).

The nets used for the contrast experiment were constructed of twisted nylon (P.A.) in 210/9 twine and 4in mesh size. The hanging coefficient for both headline and leadline was 0.5. The headrope and leadline constructions were the same as for the other gill nets. These nets were all 40 meshes deep.

Two different contrast arrangements were tried. Both involved dying different sections of the net. For one net the middle third of the net was dyed and for the other, both the upper and lower thirds were dyed. The dying process involved producing contrasting light and dark bands throughout the depth of the net. This was effected by dipping the white (or light green) nylon material in a black dye.

The 'anti-crab' barrier strips were of two basic types:-

a) large mesh barriers
b) strop barriers

The large mesh barrier strip was used in two types, one made of monofilament nylon mesh, the other constructed of polypropylene mesh. By using polypropylene the barrier strip could be dyed to produce a light and dark contrast with the bottom section of the net. This was to be monitored in relation to the experiments with the other contrast nets. By rigging some nets with a dark barrier strip in constrast to the net and others with a light contrast strip, the intention was to try and establish if the contrast difference had any affect on catch rates. The theory is that the visibility of the nets affects the fish's behaviour on approaching the net and hence also affects catch rates.

The monofilament mesh barriers were constructed from 0.65mm diameter monofilament in the form of 2 x 10½in meshes hung at a coefficient of 0.66. At this setting it was expected that, if the mesh barrier strip could be maintained in a vertical position, a height of about 16in could be attained.

The mesh barrier constructed in polypropylene twine consisted of 2 x 12in meshes in a twine size of 170/36. This was made-up either in white or dyed black to form the light and dark constrast arrangements. Again, the strip was set at a coefficient of 0.66 giving a standing height of about 18in.

Barrier strips consisting of the strop arrangement were used in four variations:-

1) 18in high strops at 18in spacings.

2) 18in high strops at 36in spacings.

3) 24in high strops at 18in spacings.

4) No regularly spaced strops but an arrangement with 18in strops to connect the false fishing line to the leadline at intervals of approximately 3 or 4 fathoms.

The reason for the variations in strop length and spacings was to try and establish a suitable compromise between reducing crab entry and potential loss of certain 'by-catch' species such as turbot, monk and other large bottom dwelling species. At the same time the drawbacks involved in the construction of this type of rig had to be borne in mind.

In order that the barrier strip arrangements be effective in reducing crab entry into the main body of the nets, it must be ensured that the strip remains standing upright even under the influence of tide. To produce this effect a three bridle arrangement was developed as a result of Flume Tank experimentation. Full details of the bridle arrangements are given in the illustrations that accompany this text (see Fig. 17).

The resultant situation with any static net in a tideway is that the potential fishing height of the net is reduced as the wall of netting is made to lay-over due to the pressure of water movement. The effect of this water movement can be reduced (and potential fishing height of the net increased) by attaching additional floatation at the ends of the net. This additional floatation however, must be balanced with additional weight, in line, directly under it to prevent the leadline lifting off the sea bed.

For all the experimental nets used during the trials this arrangement was employed incorporating a 5in spherical trawl float producing 800gms of buoyancy countered by approximately 2kg of chain weight.

As stated, this method does not entirely eliminate the 'laying down' effect. If this situation were allowed to happen with the barier strip rig then the separation between the false fishing line and the leadline would be lost, reducing the effectiveness of the rig.

By introducing a third bridle in the standard two bridle arrangement the barrier strip can be made to stand upright even in strong tidal conditions. The idea behind this three bridle rig is that the additional centre bridle takes strain on the false fishing line to which it is attached, allowing the barrier strip to stand at its optimum height. The main body of the net is still influenced by the tide and may still 'lay over' but without affecting the barrier strip (see Fig. 17).

Flume Tank tests have been limited to observations at the ends of the net. Unfortunately there is no practical means of indicating what is happening throughout the overall length of a fleet of nets (other than direct observation). Taking the assumption that the effect of the third bridle will be reduced as the distance from the end of the net is increased, it is necessary to try and maintain the strain taken-up at the bridle. To try and attain this, an arrangement of joining strops was employed at the join between each individual net. By using 3ft lengths at the headline and leadline and only 2ft at the false fishing lines, it was envisaged that the strain could be maintained throughout the length of the fleet. The result being, greater confidence in the overall effect of the barrier strips.

As an additional back-up to this arrangement additional floatation was used at the ends of the barrier strips to try and maintain optimum height. This took the form of a 6½in 'Torpedo' float (buoyancy 180gms) threaded onto a strop at each end of each net. However, after the first day of fishing operations, these additional floats were removed as they were causing great difficulties in handling the nets, particularly during shooting.

Each individual net in each fleet was numbered for ease of reference. The sequence of the nets in the experimental fleets is shown in Figs. 18-22. Each fleet was made up as follows:-

First Trial Arrangement

Fleet A

A_1 - Trammel net with monofilament mesh barrier strip
A_2 - Trammel net with light contrast P.P. mesh barrier
A_3 - Trammel net with dark contrast P.P. mesh barrier
A_4 - Gill net with monofilament mesh barrier
A_5 - Gill net with light contrast P.P. mesh barrier strip
A_6 - Gill net with dark contrast P.P. mesh barrier strip

Fleet B

B_1 - Trammel net with 18in x 18in strop barrier strip
B_2 - Trammel net with 18in x 36in strop barrier strip
B_3 - Trammel net with 24in x 18in strop barrier strip
B_4 - Gill net with 18in x 18in strop barrier strip
B_5 - Gill net with 18in x 36in strop barrier strip
B_6 - Gill net with 24in x 18in strop barrier strip

Fleet C

C_1 - Trammel net strops at 3-4 fathom spacings
C_2 - Contrast gill net (light, dark, light) no barrier strip
C_3 - Contrast gill net (dark, light, dark) no barrier strip
C_4 - Gill net strops at 3-4 fathom spacings

Second Trial Arrangement

Fleet A

A_1 - Trammel net with monofilament mesh barrier strip
A_2 - Trammel net with light contrast P.P. mesh barrier
A_3 - Trammel net with dark contrast P.P. mesh barrier
A_4 - Gill net with monofilament mesh barrier
A_5 - Gill net with light contrast P.P. mesh barrier strip
A_6 - Gill net with dark contrast P.P. mesh barrier strip
A_7 - Trammel net with strops at 3-4fm spacings

Fleet B

B_1 - Trammel net with 18in x 18in strop barrier strip
B_2 - Trammel net with 18in x 36in strop barrier strip
B_3 - Trammel net with 24in x 18in strop barrier strip
B_4 - Gill net with 18in x 18in strop barrier strip
B_5 - Gill net with 18in x 36in strop barrier strip
B_6 - Gill net with 24in x 18in strop barrier strip
B_7 - Gill net with strops at 3-4fm spacings

Fleet C

C_1 - Contrast gill net (light, dark, light) no barrier strip
C_2 - Contrast gill net (dark, light, dark) no barrier strip

The control fleets, labelled D, E and F were made up as described below.

Each fleet consisted of six nets of 100yds fishing length giving a total of about 1800yds of netting. The fleets were broken down into two trammel net fleets and one gill net fleet.

The trammel nets were rigged to the following specifications:-

The lints consisted of 4½in monofilament P.A. mesh of 0.4mm diameter hung onto a headline composed of No. 4 floatline and 6mm diameter P.P. braided backline. The hanging coefficient was 0.5. Number 3 leadline was used throughout for all the control nets. The armourings were made up of 0.7mm diameter monofilament. Nets with both 24in and 12in armouring meshes were incorporated into the fleet. Those nets with 24in outers had lints of 30 meshes deep and those with 12in outers had lints of 20 meshes deep, the armourings being 4½ and 6½ meshes deep, respectively and hung at a coefficient of 0.75.

One section of the trammel fleets was made up of net incorporating a multi-monofilament lint (1.5 x 6).

The gill nets used had 5in x 0.4mm monofilament meshes at 25 meshes deep. These nets were hung at about 0.33 again on No. 4 floatline and at a coefficient of 0.45 on a No. 3 leadline.

Along with the vessel's own fishing gear which included:-

Three fleets of monofilament trammel nets with 4½in lints and 8in armourings (similar specification to experimental nets).

Three fleets of trammels using 12in multi-monofilament armourings and 4½in lints.

A considerable cross-section of net types were available for comparison with the experimental gear.

5 FISHING OPERATION - M.F.V. OUR WAY

During the short steam to the fishing grounds the vessel was made ready for the days operations. This entails laying down tarpaulins on the deck in the area below the net hauler in order to cover-up the access hatch cover to prevent the nets fouling on the combings and hinges etc. By allowing the nets to fall onto these covers as they come off the hauler, it also enables the nets to be pulled clear of the hauler if it is necessary to haul another net before clearing the previous one.

Any gear or equipment not being used during the fishing operation is cleared away and stowed to provide maximum clear space for handling and stowage of nets. When working such large quantities of gear as this class of vessel invariably has to, clear deck space is essential.

The vessel is normally manned by the skipper and two crew members, but on some occassions (for example when extra gear is being fished or excessive clearing times are envisaged), an extra crew member is carried. In order to speed up the fishing operation during the course of the trials, three crew members were normally present.

Net positions were all recorded using the Shipmate RS4000C Navigation equipment. Normally the individual fleets are located visually but it is essential to have the positions recorded for such times when the fleets are not visible, i.e. in poor weather conditions or on occassions when the dahns are lost either due to weather or other vessel activity (such as trawlers towing the dahns away). If the dahn markers from both ends of a fleet are lost, then if accurate positions have been recorded, the vessel has some chance of recovering the gear.

As the vessel approaches the first net marker, the net hauler is moved into an appropriate working position. The direction in which the gear is hauled depends on prevailing wind and tidal conditions. If tidal conditions are not too strong the skipper's preference is to haul the gear 'into the tide'. This enables the skipper to have more control when keeping the vessel up to the gear using the engine.

Once the dahn marker is alongside the vesel, it is picked-up by one crew member and the dahn-rope passed over the conveyor hauler. That crewman then stows the dahn to one side clear of the operation while another crewman takes the dahn rope and proceeds to haul the net over the hauler. As soon as the anchor has been hauled and stowed clear, all crew members stand-by the hauler to clear the net of fish and debris as it is hauled. One crew member guides the net through the hauler and is standing-by the hydraulic controls at all times. This man controls the speed of the operation.

As soon as the first net is recovered, the dahn line and anchor are moved aft to be stowed in a position ready for shooting back. The first net is then pulled back over a supporting bar (usually a bamboo cane) to separate the headrope and leadline and 'turned-over' into the position from which it will be shot. This operation can be performed by one crewman but is usually carried out by two. As this operation is being carried out the vessel manoeuvres into position for recovery of the next net.

If catch rates are relatively low and the amount of crabs and debris encountered are small, it is usual for all the net to be cleaned as is it hauled. If the contrary applies, then anything missed as the net is hauled, is removed as the net is 'turned-over'.

The fish that are removed from the nets are stowed in boxes on deck. If time allows the fish will be gutted and washed between hauling nets. If sufficient time is not available then this operation is performed once all the gear has been hauled. To try and maintain the quality of the catch it is covered at all times whilst on deck to prevent drying out.

This operation is repeated until about 5 or 6 fleets of nets are onboard. These nets would then be shot back before hauling the remainder of the nets. This allows for more clear deck space for ease of operation.

The vessel's usual operation is to shoot the nets over the stern or starboard side of the vessel. As the vessel approaches the desired shooting position, the dahn is thrown overboard followed by the dahn rope and anchor. The vessel gradually builds up speed as the net streams out over the ships rail. To ensure that the net does not snag any part of the vessel as it streams out, one crew member guides the netting away from the ship's side using a bamboo pole (see photographs). Using this method, the vessel can shoot the gear at almost full speed. The shooting operation is carried out 'down-tide' to ensure that the nets take-up the best position on the sea bed. Occassionally, in periods of very slack tidal conditions, the vessel will shoot gear in both directions, i.e. North/South and South/North in order to save time. This is only possible when there is no tide to influence the settlement of the gear.

6 TRIALS NARRATIVE - FIRST TRIAL PERIOD 4/9/88 TO 9/9/88

All fishing gear and equipment was transported to the port of Sunderland on Sunday 4th September 1988. The experimental and control nets were rigged into fleets of 6 nets and put onboard the charter vessel M.F.V. OUR WAY on Sunday afternoon, to be shot that evening in order to commence sea trials the following morning.

The fishing pattern for the duration of the trials was to be the same from day to day (weather permitting), with the vessel sailing at approximately 0600, hauling the nets (experimental, control and the vessel's own nets), clearing the nets and 'shooting back'. The intention was to try and return to the quayside in the early afternoon to enable the days catch to be sold by the quayside salesman.

Just prior to the trials period the charter vessel had been working to the south of the River Wear where catch rates, although relatively poor, were showing signs of improvement. It was decided that the same areas would be tried in the initial part of the trials.

The areas of operation are shown on the chart sections accompanying this report. The north and south ends of each fleet are marked (and recorded in the log sheets for each days operations) to show the positions of the fleets in relation to one another. For the purpose of this report only the positions of the Experimental and Seafish control nets are shown. The vessel's own nets, also used as a control, are not indicated but were fished either adjacent too, or among the other fleets in order to compare catch rates.

The steaming time to the fishing grounds varied but was usually between 20 and 40 minutes depending on conditions.

On arriving at the fishing grounds the fleets were hauled. No particular sequence was used. The nets were hauled as they were arrived at and this was partly determined by weather, tidal conditions and on the activities of other vessels working in the vicinity. The usual operation was to haul and clear one fleet and then steam onto the next fleet, during which time the first net would be 'turned-over' and stowed (usually aftside) ready for shooting back. The term 'turned-over' simply refers to the procedure of laying-down the net with the headrope and footrope separated in such a way as to make sure the net goes away clear during shooting. By clearing the net in this way, any twists or turns can be removed as well as anything that may foul the net during shooting.

This operation would be repeated until 5 or 6 nets were stowed onboard ready for shooting. These nets would then be 'shot-back' to create space in order that the rest of the nets could be hauled. The nets were always shot with the tide unless shot at slack water on small tides when, with little or no tidal affect, the nets could be shot either way. Hauling was normally carried out against the tide (weather and sea conditions permitting) in order to keep some weight on the gear, preventing slack netting causing problems and also lessening the chance of loosing loosely meshed fish.

Under normal fishing operations any large concentrations of crabs encountered in the gear are dealt with either by breaking off the claws and legs leaving the carapace which can be more easily removed from the net, or by smashing the whole animal by stamping on them whilst still in the net. In any event, the end result is the same, the destruction of considerable number of crabs. The majority of crabs encountered during the course of the Seafish trials were immature Brown crabs (Cancer pagurus) in a post-moult condition, i.e. with soft shells in the process of hardening (known as 'white crabs' in this condition).

Obviously any large edible crabs in good condition are removed intact to be landed as a by-catch. Sometimes the removal of these larger animals can take a considerable time.*

Any crabs caught in the net must be dealt with immediately after coming through the hauler. If allowed to fall on the deck amongst the rest of the netting, the result is that they become even more entangled, making the job of removal even more difficult. For this reason, when any crabs are encountered in the net, that piece of netting is pulled to one side clear of the rest of the net. Lobsters have to be dealt with in a similar way but with a greater deal of respect since they represent a very valuable by-catch.

Whenever possible, areas that are known to be holding grounds of large concentrations of crabs are avoided. However, if these same areas are also holding fish, then the fishermen will shoot on these grounds and suffer the consequences of the crabs.

In order to test the effectiveness of the experimental nets it was necessary to shoot on grounds that were holding some amount of crabs. Excessive numbers had to be avoided with respect to the control nets, since net clearing times had to be kept to a minimum in order that all the gear could be hauled and shot-back in time to allow the vessel to meet the market deadline.

As previously mentioned <u>all</u> lobsters caught are removed with care and intact. All undersized lobsters (locally known as 'chats') were removed and returned to the sea. The larger individuals were saved and landed for sale.

*<u>Note</u>:- The removal time for individual crabs of varying sizes ranged from 3 to 7 minutes. Even for small concentrations, intact removal would be inconceivable.

On behalf of the M.A.F.F. Fisheries Laboratory at Lowestoft, wherever possible, the numbers, size and sex of Brown crabs and lobsters were recorded as part of one of their research projects.

For all the experimental nets and the Seafish control nets the following information was recorded:-

a) Numbers and species of fish caught.

b) Region of net where fish were caught, i.e. upper, middle or lower third.

c) Numbers, size and sex of Brown crabs and lobsters caught.

d) Approximate weight of fish and shellfish taken in each net/fleet.

Observations were made on the following:-

a) Effectiveness of the experimental nets in performing the desired task and any adverse affects directly attributable to the design of the gear.

b) Ease of clearing of the nets (in comparison to vessel's own gear).

c) Catch rates of vessel's own gear in relation to experimental nets.

d) Any handling problems encountered due to the specific nature of the experimental gear.

Unfortunately, on numerous occasions during the course of the trials the fishing was greatly hampered by the presence of large concentrations of large jellyfish. It was quite apparent that the experimental nets and the Seafish control nets were 'more efficient!' at catching jellyfish than the vessels's own nets.

This was attributed to the fact that both the experimental nets and the control nets were rigged with additional floatation resulting in them having a greater fishing height throughout a greater proportion of the tidal cycle when compared to the vessel's own nets. Some other minor factors may have also attributed to the heavy concentrations encountered in the Seafish nets (see Discussion).

The presence of the jellyfish posed considerable problems. It was thought that the large quantities of jellyfish caught in the nets may have been affecting fishing performance of the gear. The other major problem was one of handling the gear. The 'stinging' effect of the jellyfish caused severe irritation when in contact with human skin. This resulted in Seafish staff and crew having to take protective measures in the form of full face visors to protect the eyes and full length gloves to protect the hands and arms. The presence of the jellyfish meant that net clearing times and 'turn-over' times were increased. Handling and shooting had to be carried out with extra caution to minimise the risk of skin contact with the jellyfish.

Once all the nets had been hauled and shot-back and positions of fleets and all other relevant information recorded, the vessel returned to port.

During the steam back to port the days catch was sorted, gutted, washed and boxed ready for the quayside sale.

7 FISHING OPERATION - MFV NIKKI-D

Essentially, the fishing operation described for the M.F.V. OUR WAY applies to the M.F.V. NIKKI-D. The only major differences were attributable to the fact that the two vessel layouts are different. The M.F.V. OUR WAY has an aft-wheelhouse design with the hauler situated forward and the M.F.V. NIKKI-D has a forward wheelhouse layout with the hauler situated just aft-side of the wheelhouse on the starboard side.

All the gear was shot over the transom of the NIKKI-D whereas, due to space restrictions much of the gear on the OUR WAY was shot over the starboard rail using a shooting stick (see Fig. 26).

The forward wheelhouse layout on the NIKKI-D provides a large clear working area for net stowage and shooting. Nets are stowed, ready for shooting in a position aft at the transom. Usually three fleets would be stowed (headlines laid to one side and footropes to the opposite side), the first against the stern rail and then covered with a tarpaulin or sheet. Another fleet would then be stowed just forward of the other fleet. By covering the nets, the forward nets can be shot first, over the top of the others without snagging. A third fleet can then be accommodated just forward of the second, against the engine hatch. The net weights/anchors (railway 'chairs') are stowed in sequence, aft to forward on either side of the stowed nets. The dahns are stowed on the port side in pairs corresponding to each fleet (see diagrams).

If nets can be cleared and kept open during the hauling process, it is possible to shoot some nets straight from the hauled position at the hauler providing the transom area is reasonably clear of other gear.

The vessel's normal fishing operation is carried out by the skipper and one other crew member, but on occassions when fishing is heavy or net clearing times are excessive, two crew are carried. For the duration of the trials an additional crew member was carried to ease handling operations.

Using the net stowage system as described, the shooting operation is simple and straightforward, providing the anchors and dahn lines have been stowed correctly and in sequence.

As the shooting position is approached the dahn marker is thrown overboard as the vessel manoeuvres into position to shoot down-tide. On instruction from the skipper, the crewman puts the anchor/weight overboard as the dahn line comes tight to it. The bridles and net then stream out over the transom rail. It must be ensured that the bridles are made long enough to leave enough distance between the weight and the net to allow the crew member to clear the weight overboard and get himself clear before the net starts to go out. This was particularly important with the Seafish experimental nets which were rigged with 5in trawl floats and chain weights at the net ends. These had to be kept clear during shooting to prevent them fouling other parts of the net as they went outboard.

As the net streams clear of the transom, the skipper can then increase vessel speed, to speed-up the operation. Providing no problems/snags are encountered (and weather conditions permit) the gear can be shot at very high speed. The vessel is only eased-down as the ends of the nets are reached. This allows time for the crew to ensure anchor weights and dahn lines are clear.

The positions of the nets were recorded as normal practice using the Shipmate RS 4000 Navigator.

Due to the design and characteristics of the light displacement planing hull of the NIKKI-D, the vessel's hauling operation is greatly influenced by weather conditions. In particular, wind affects the vessel to a high degree tending to push the vessel's head round when trying to maintain position on the gear during hauling. This results in continuous use of throttle and wheel during the hauling operation.

Once the fleets have been located the skipper selects which end of the fleet is to be hauled first. This decision is influenced by weather and tidal conditions.

As the dahn is picked-up the dahn line is passed over the conveyer hauler and stowed clear on the port side. The anchor weight is also taken over the hauler and placed to one side clear of where the net is to be hauled. (The use of old 'railway chairs' as anchor weights means that they can be taken over the hauler without stopping the operation - a procedure that would not be possible with fluked anchors). Dahn lines and anchor connections are checked for signs of wear as they are hauled.

Once the net is reached, the hauling operation involves one crew man pulling the net through the hauler while the second crew member clears any fish or by-catch/debris from the net. If conditions and catch rates permit, the man on the hauler attempts to separate the headline and footrope of the net as it comes through the hauler. Usually the weight is taken on the headline (it provides more purchase for the operator). By separating headline and footrope at this stage the 'turning over' of the net is speeded-up. When the end of the net is reached, the dahn line and dahn are picked-up and the skipper proceeds to the next fleet.

As the vessel moves into position to haul the next fleet, the crew prepare the net that has just been hauled for shooting back. This operation involves two people positioned, one on each side of the vessel at the stern. Firstly the dahn is stowed on the port side against the port side rail and the dahn line coiled down at the stern. As the anchor is reached, it is positioned to one side (usually the last anchor to be shot for each fleet is positioned on the port side where it can be easily reached). The bridles of the net are then coiled-down over the dahn line. At this point in the operation a bamboo pole is laid across the rails (athwartships) over which the net is pulled in order that the headrope and footrope can be separated (see diagrams and photographs). The headrope is stowed to one side and the footrope to the other. This 'turning-over' operation ensures that all fish and debris have been removed and that all turns and twists are taken-out to allow the net to be shot-back cleanly. Once the net has been stowed, the bridles and dahn line are coiled down on top of it and the anchor (the first one of that fleet to be shot) is stowed on the starboard side. The dahn is stowed alongside the first dahn, but inboard of it, as it is the first one of that fleet to be shot. By ensuring clear stowage of dahns and anchors the shooting operation can be carried out smoothly without endangering crew members.

The remaining fleets are hauled, cleared and stowed in the same way in preparation for shooting-back. The anchors for the remaining fleets are stowed in similar positions but in sequence running from aft to forward. Similarly the dahns are stowed in sequence but from forward to aft so that the first dahns to be shot are to-hand for the crew member in the shooting position at the stern.

The catch, once removed from the net is sorted and boxed to be gutted and washed on the run back to port from the fishing grounds.

8 TRIALS NARRATIVE - SECOND TRIAL PERIOD 13/2/89 TO 25/2/89

All trials gear and equipment was transported from Hull to Sunderland on Sunday 12th February.

The trials nets were put onboard the charter vessel NIKKI-D on the Monday morning at 0630. All the vessel's own gear was offloaded and replaced by three fleets of Seafish experimental gear and three fleets of control nets.

Skipper Waterstreet had two fleets of nets in the water from the previous days work. This gear had to be left due to deteriorating weather conditions. Unfortunately the poor conditions continued into Monday. During a short break in the weather, the charter vessel proceeded to sea with the intention of retrieving the remaining gear and (if conditions and forecast allowed) shooting the experimental gear. The skipper's gear was hauled but under difficult conditions. The skipper did not think it was wise to shoot the Seafish gear at this stage. The vessel returned to port to await better weather conditions.

Early Tuesday morning conditions had still not improved sufficiently to shoot the gear. A moderate to heavy inshore swell originating from strong north-westerly winds to the north of the area made fishing impossible on the inside fishing grounds. A strong westerly to south-westerly wind had developed which showed signs of 'knocking back' the swell. By late afternoon conditions improved slightly with the prospect of better weather for the following day. The vessel proceeded to sea around 1500 hours and shot three fleets of experimental gear plus three fleets of control gear. The nets were shot on the inside fishing grounds to the south-east of Sunderland Pier.

Wind strength had increased to westerly gale force 8 but the inside fishing grounds were suffiently sheltered to allow fishing operations to continue.

The strong westerly winds were moderating on the morning of Wednesday 15th February which allowed the charter vessel to proceed to sea to haul the nets shot on the previous day. No major problems were encountered with respect to the weather conditions but very poor catch rates made assessment of the gear difficult. There was evidence of seal activity in and around the gear. Tell-tale indications such as fish with heads removed and the typical twisting and knotting up of meshes left where a seal has removed a fish from the net. The catch consisted mainly of small codlings with a number of undersize whitings. The total catch of one box (approximately 6 stones) was made up of approximately 4 stones from the experimental nets and 2 stones from the controls. A few undersize edible crabs were taken, along with one undersize lobster in the control gear. No crabs were taken in the barrier nets.

With the prospect of an improvement in the weather (considering the catch rates on the first day) the skipper decided to move the gear in an attempt to locate better fishing. The intention was to gradually move the gear further offside (weather permitting) in order to avoid seal activity.

The nets were shot about one mile to the east of the previous shot. The gear was all shot on similar ground. On this occasion it was mainly hard ground with the occasional patch of mixed hard and soft encountered over the length of the nets.

As a result of the north-westerley swell that was present on the previous day (Tuesday 14th February) it had been expected that a 'stir-up' of the seabed would improve fishing. As it happened, the very strong westerly winds countered the effect before enough seabed movement had been set up to do any good.

As with the previous trials in this project, all crabs and lobsters caught were measured and sexed on behalf of the MAFF Fisheries Laboratory at Lowestoft as part of one of their on-going shellfish projects. As far as Seafish Data was concerned all crabs and lobsters as well as undersize fish and non-target species were classed as by-catch.

On Thursday 16th February, the forecast had proved to be unreliable. A fresh to strong west-north westerly wind made fishing conditions difficult. Once again the presence of seals reduced the catches. Only six fish were taken out of the six fleets of experimental and control nets. Only one other vessel from Sunderland was operating that day. The M.F.V. OUR WAY reported only three codlings from grounds to the north side of the River Wear. The skipper also reported the presence of seals in his area. Only a few crabs were caught, all from the control nets.

Since some handling problems had been encountered as a result of the weather, it was decided to move the gear back inside to allow unhindered fishing to continue. The gear was shot to the south of the South Pier. The skipper had chosen this area with the prospect of catching flatfish (small plaice, dabs, flounders etc) and coalfish. Normally these are not prime target species but the intention was to try and establish if the barrier nets were as effective at catching flatfish species as a standard net.

There was a slight ground swell present on the inside grounds which posed a few problems when the gear was hauled on the following morning. The wind had backed round to the south and south east and increased from fresh to strong. Combined with a moderate to heavy swell on the inside grounds it posed problems hauling the gear. The control fleets had picked up considerable amounts of ground debris and rubbish which consisted mainly of boulders and stones. This was a result of the ground swell causing bottom movement.

Considerable damage in the form of parted leadlines and damaged bottom sections of net resulted. The experimental nets also suffered damage but it was mainly confined to the nets rigged with the mesh barrier strips. The strop rigged nets had managed to remain mostly intact. This seemed to indicate that these nets were operating as intended, i.e. maintaining the main body of the net above and clear of the seabed.

The catch from both the experimental and control nets amounted to only one six stone box consisting mainly of mixed flatfish (plaice, dabs and flounders) and small codlings and coalfish. The only crabs caught came once again from the control nets. Both the strop nets and the mesh-barrier nets caught flatfish mainly in the area of netting just above the barrier. These were promising results suggesting that the barrier srips may not reduce catches of flatfish etc. as much as first was suspected. However the control nets did catch more flatfish than the experimental nets but once again the quantities were insufficient to allow any conclusions to be drawn from the data collected.

The very poor weather and sea conditions made data collection and catch analysis very difficult.

All the experimental and control fleets were hauled and stowed on deck to be 'turned-over' in the shelter of the harbour. A poor forecast called for a re-assessment of the situation before considering shooting-back.

The gear was 'turned-over' and cleared in preparation for shooting while the vessel was tied-up in the shelter of the harbour.

A promising report was received from the vessel CHALLENGE III. The skipper reported three boxes of codlings from a short shot on the inside marks to the north of the harbour. By late afternoon the weather had eased and the wind had veered to the south-west. It was decided to move to the area to the north of the harbour and shoot the gear in the hope of some improved catches. The gear was shot in a straight line north from the piers in an attempt to locate the small concentrations of fish that had been reported.

The weather had moderated to south westerly 3-4 with a moderate swell. The gear was hauled from the south end and produced a blank result up to the last net. Approximately one box of mixed fish (flatfish and codlings) came from the last net at the north end of the fleet. The gear was cleared and shot back northward from the position of the last net. Other vessels working the same area had reported similar results. Once again seals had proved a problem causing considerable fish losses from gear. The control nets picked-up three lobsters and a number of edible crabs, mostly undersize.

Gale force winds from the west prevailed on the following day occasionally reaching severe gale force in squalls. The gear was hauled for only a few fish and shot back on the inside ground at an area known as the 'Beacons' and 'Rocky Dean'.

On the Monday morning the vessel sailed at the usual time of 0630. The forecast for the day was west-south-west gale 8.

On hauling the first fleet of experimental nets, signs were promising with a number of codlings being caught. However, this was short-lived with blank results from the second and third fleets. The first of the control fleets also showed poor results with the best results coming from the last two control fleets. These were at the south end of the shot. The gear was shot back in this area. Local reports indicated that the charter vessel had been the only vessel to locate fish that day, albeit very small quantities.

Catch rates continued to be poor on the following day, with only half a box of mixed flatfish and coalfish. The last net of the control fleet produced considerable numbers of small immature codlings and whitings. These were all returned alive where possible. The weather conditions again confined operations to inshore grounds. The gear was shot back on very hard pinnacles in the area of 'Hendon Rock'. Seals were observed in the area of the gear after it had been shot.

On Wednesday 22nd February the gear produced blank results apart from one control fleet and one experimental fleet. The total catch consisted of about five stone of mixed fish. Once again operations were hampered by poor weather (south-south westerly 6-7). Reports of half boxes and one to two boxes were best for the day. The gear was shot to the south and east of the previous shot.

It was evident that seals had been working through the fleets leaving their tell-tale marks.

The situation remained the same for the following day - poor weather, poor catches and the problems of seals still present. Blank results from all but one net which produced about three stone of mixed fish, with yet more evidence of seal damage. Very few crabs were encountered. The gear was shot back on the beaches to the north of Seaham Harbour. The other boats working that day reported half to one box for the day's work.

Blank results were again recorded on Friday 24th February. The total catch for the full fleets of gear was half a box of mixed fish, of which 90% came from one experimental fleet. The gear was shot around some wreckage about four miles east of the harbour. The weather was showing signs of improvement having moderated to a light to moderate south westerly breeze. A slight swell remained. By late afternoon the lull in the weather had elapsed with the wind freshening and backing south easterly with frequent snow squalls.

On Saturday morning sailing was delayed due to adverse weather. The weather had deteriorated through the night to a south easterly gale. Sailing was postponed until after daylight so that sea conditions could be assessed. Daylight revealed a moderate to heavy swell dying down with a fresh to strong south westerly breeze. The vessel proceeded to sea to haul the gear at about 0730. The nets closest to the wreckage showed the best results amounting to about one 6 stone box, about half of which was caught by the experimental nets and half by the controls. Some flats were caught in the barrier net but as with the previous days, no crabs or lobsters. One or two of the control nets produced numerous crabs and some debris which was not evident in the barrier nets. This was the last day of sea trials. The vessel returned to port to offload the experimental nets and equipment.

9 DISCUSSION

The evaluation trials were hampered by numerous factors. Both the September 1988 and the February 1989 trials suffered due to very low catch rates. Very poor weather conditions and the presence of seals on the inshore fishing grounds limited the areas of operation during the trials periods.

The North East coast fishery usually encounters problems with seals around, and just after, Christmas. By February seals have usually moved out of the inshore fishing grounds. For some reason the seals remained on the grounds right up until March.

The poor weather conditions reduced fishing time and restricted the areas of operation to the sheltered inshore grounds. Consequently the few vessels that persisted and fished in the borderline conditions were targetted by the seals. The result was seals and fishermen competing for the limited numbers of fish on the grounds.

Abnormally high water temperatures were prevalent throughout the winter of 1988/89. Normally the colder winter months cause a reduction in crab activity and movements. This results in fewer problems for the static net fishermen. However, because of the very mild conditions more crab activity was noticeable than in previous years. This was to prove beneficial to Seafish's work in that it allowed the trials of the 'anti-crab barrier nets' to be carried on later in the year than had been expected.

The very low catch rates encountered during the 1988/89 static netting season put many of the local fishermen under a lot of financial pressure. From the point of view of the project and the evaluation trials, the low numbers of fish encountered meant that insufficient data were collected to establish any conclusions about the overall effectiveness of the gear. However, it is fair to say that from the limited results obtained, the barrier nets were effective in their main purpose of reducing crab entry into the gear.

On all occasions when crabs were encountered it was the standard control nets which were catching them. It is still to be established whether the design of the barrier nets does adversely affect the catching potential of the gear, particularly with respect to ground species like flatfish and monkfish. On the number of occasions when the gear was shot close to the beaches in areas where catches of flats were experienced, both the control nets and the experimental nets did catch flatfish. Once again the numbers were insufficient to be of any statistical signifcance.

The low numbers of fish encountered meant that the intended procedure of recording catches from each individual length of net in each fleet had to be abandoned. The gear was examined as a fleet length and not individual nets.

The trials did highlight some problems inherent in the rigging of the barrier nets. In particular the strop rigged nets posed some handling problems when shooting. The strops are knotted onto the false fishing line and leadline and anything other than a very small knot has the tendancy to catch-up in the mono netting. At the present time a more practical way of constructing the strop barrier rigs has not been found.

Construction of these barrier type nets invariably involves more time, work and materials. If it can be established that this type of gear is effective at reducing crab mortalities without adversely affecting fish catching potential, then the next stage must be to establish a more suitable way of constructing this type of net. At this stage of the development work further attention to the construction of the nets would probably not be justified. The priority must be to establish the effect of the rig on fish catching potential. This would require further trials when catch rates were high.

One of the aims of the trial was to examine the colour contrast aspect of both the barrier nets and the nets specifically rigged with contrasting light and dark sections. Once again the poor fishing meant that no evaluation could be made.

A further trial is proposed to observe the experimental nets on the seabed using an underwater inspection camera. In this way it may be possible to confirm the effectiveness of the three-bridle rig in maintaining the barrier strips in a vertical attitude. This will at least confirm that the gear is fishing correctly.

The advantages of the use of monofilament PA in the construction of gill and trammel nets were clearly observed from the point of view of improved net clearing. The removal of crabs and bottom debris is noticeably easier from mono nets than multifilament PA nets. It is also noticeable that the mono material does not pick-up as much debris in the first place when compared to multifilament PA.

The strop barrier nets also showed their effectiveness in reducing entry of seabed debris on numerous occasions. When ground swells cause movements of rocks and stones, standard trammels and gill nets are very often damaged when these rocks and stones are picked-up as a result of these movements. The strop barrier nets rigged with the three bridle arrangement proved effective in reducing this problem. The large mesh barrier strips were also effective in this respect but to a lesser degree, dependent on the size of rocks and stones encountered.

10 CONCLUSIONS

The data collected during the course of the two trials periods was insufficient to draw any real conclusions. However, it is fair to say that the indications were that the gear is capable of accomplishing its main purpose of reducing crab entry and hence reducing crab mortalities. This also suggests that the three-bridle rigs used in conjunction with the use of floatation to try and maintain the fishing height of the nets at all states of the tide were effective.

On a number of occasions, as a result of rough weather and resulting ground swells that developed, considerable damage was caused to the standard nets. Moving rocks and stones on the seabed collect in the footrope region of the net causing extensive damage. This problem was less evident in the nets rigged on strops.

The trials also highlighted one or two handling problems with the experimental strop nets. These were caused by the particular method of attachment of the strops to the false fishing line and footrope. The knots used for attachment were prone to catching on the monofilament netting material and sometimes resulted in nets fouling when shooting. A more suitable method of attachment would have to be developed to eliminate this problem.

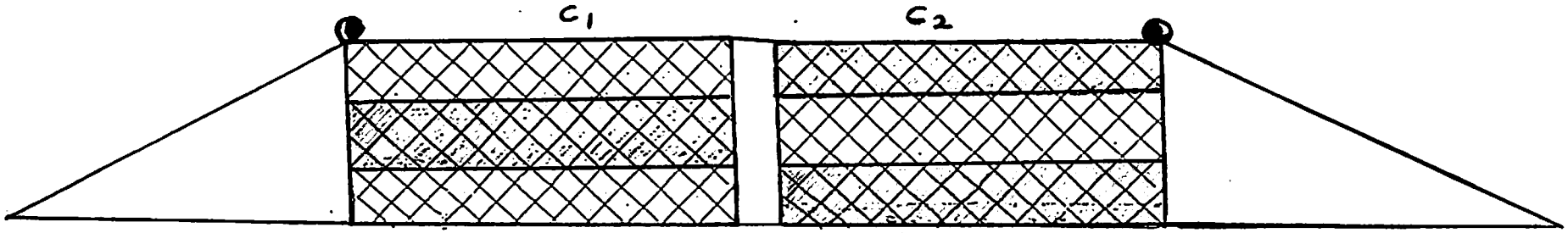
In order to establish the effectiveness of these rigs the trials would have to be repeated at times when sufficient quantities of fish were on the grounds in order to gain significant data to confirm that the system does not have a detrimental effect on catch rates of target species.

DIAGRAMS SHOWING VESSEL LAYOUT RELATING TO THE FISHING OPERATIONS

M.F.V. OUR WAY

Diagram Showing Rigging Sequence of Experimental Fleets (Second Trial) contd. Fig. 22

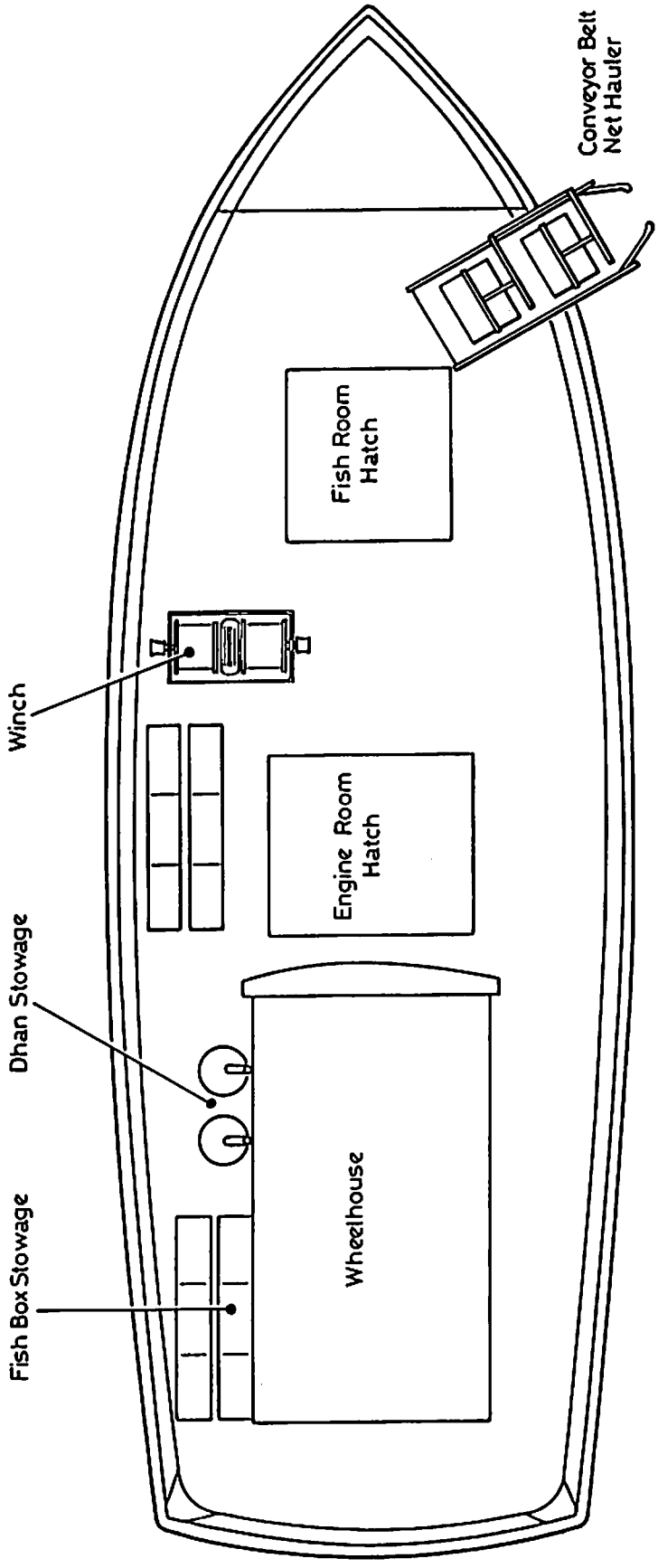
FLEET C.



DIAGRAMS SHOWING RIGGING SEQUENCE OF EXPERIMENTAL FLEETS

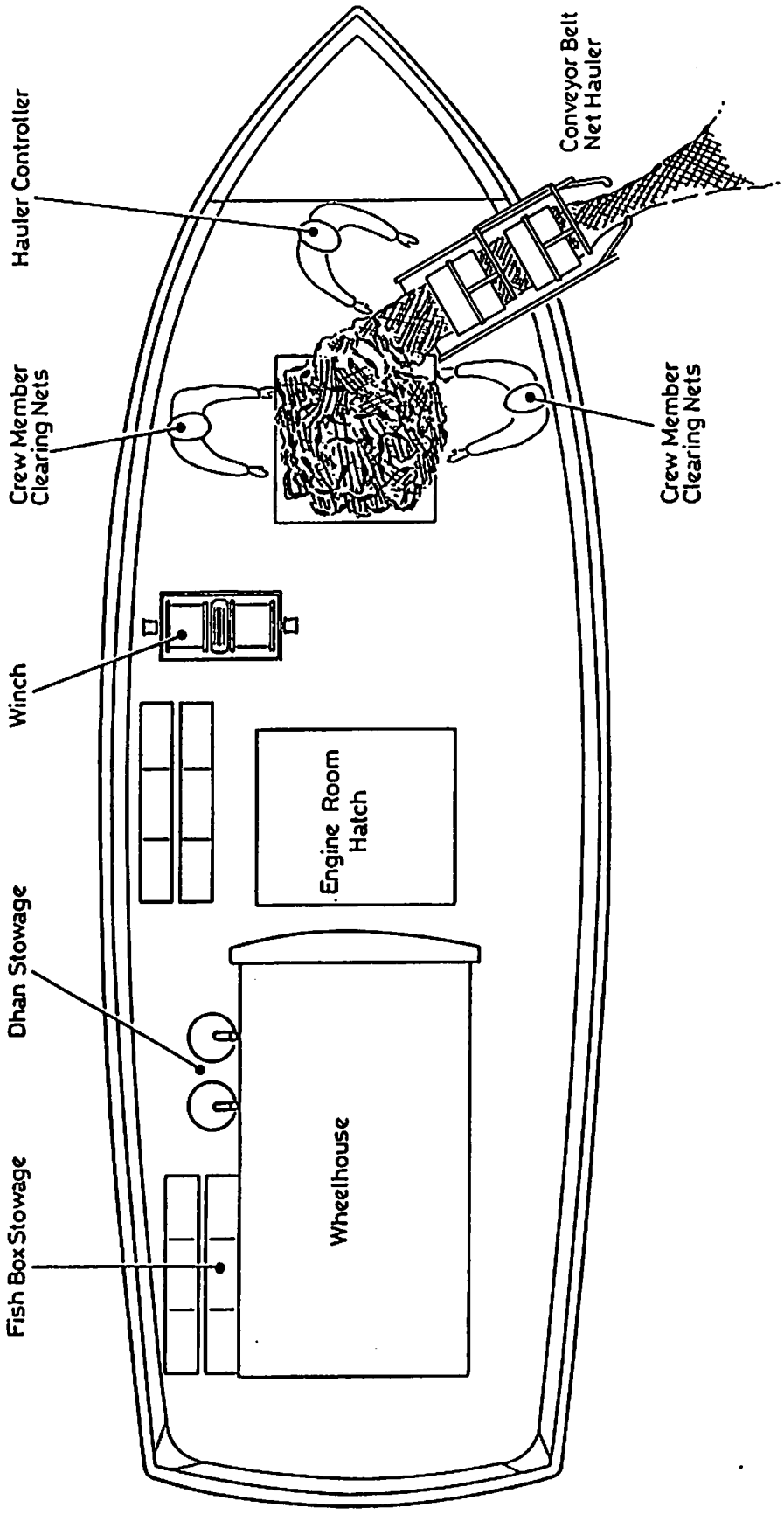
Key

A_1 – Trammel net with mono mesh barrier strip
A_2 – Trammel net with white P.P. mesh barrier strip
A_3 – Trammel net with dark P.P. mesh barrier strip
A_4 – Gill net with mono mesh barrier strip
A_5 – Gill net with white P.P. mesh barrier strip
A_6 – Gill net with dark P.P. mesh barrier strip
B_1 – Trammel net with strop barrier strip – 18"↑ x $\overrightarrow{18"}$
B_2 – Trammel net with strop barrier strip – 18"↑ x $\overrightarrow{36"}$
B_3 – Trammel net with strop barrier strip – 24"↑ x $\overrightarrow{18"}$
B_4 – Gill net with strop barrier strip – 18"↑ x $\overrightarrow{18"}$
B_5 – Gill net with strop barrier strip – 18"↑ x $\overrightarrow{36"}$
B_6 – Gill net with strop barrier strip – 24"↑ x $\overrightarrow{18"}$
A_7 – Trammel net with 18" strops at 3 fathom spacings
C_1 – Gill net with contrast sections – light – dark – light
C_2 – Gill net with contrast sections – dark – light – dark
B_7 – Gill net with 18" strops at 3 fathom spacings



Deck Layout

Fig. 23



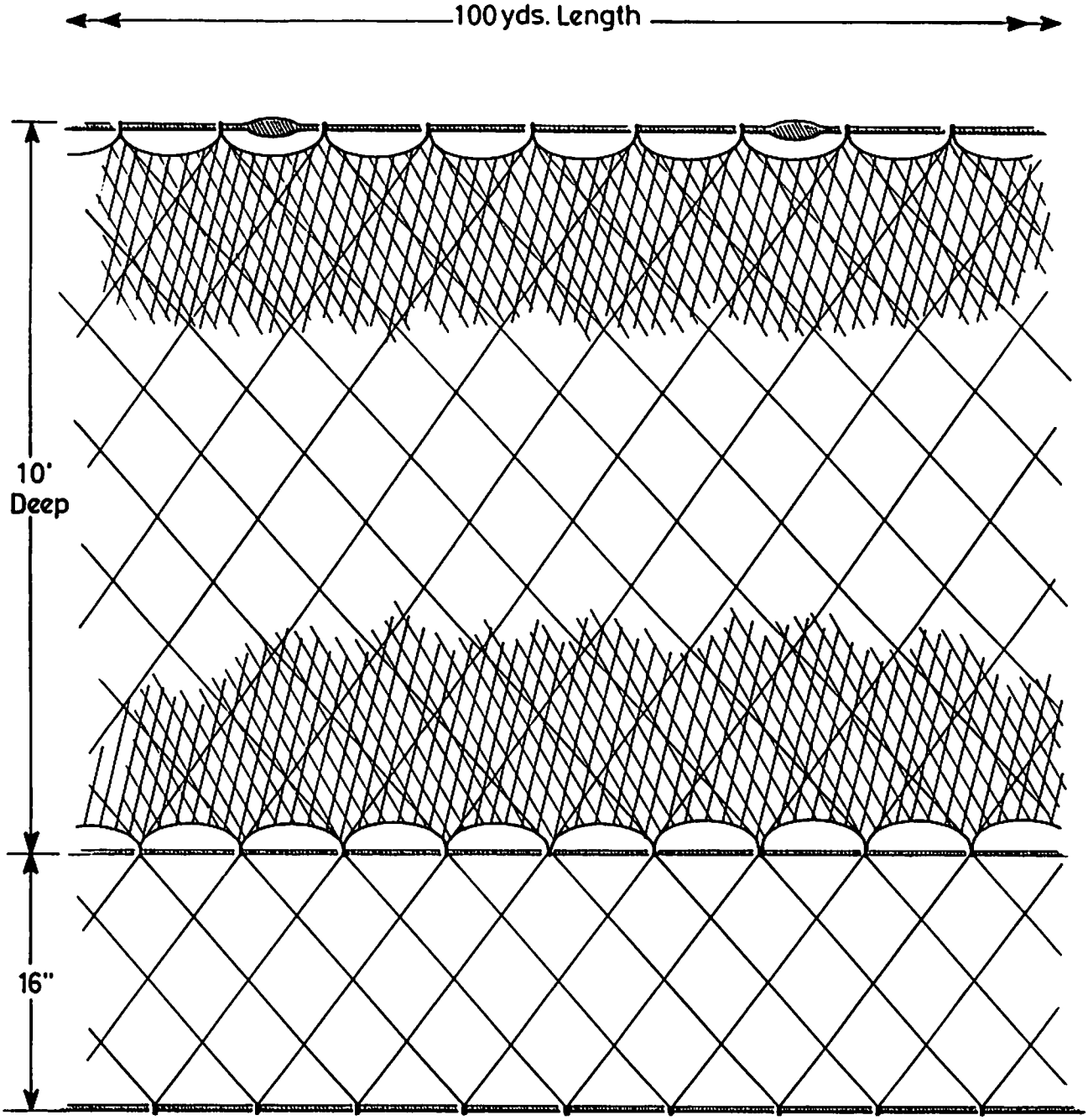
Hauling the Net

Fig. 24

APPENDICES

DIAGRAMS SHOWING DETAILS OF THE EXPERIMENTAL NETS

A 1.



ARMOURING 8" Mesh

= 0·57 Ø
= 0·66 E
20 meshes deep

BARRIER 2. 10½" Mesh

0·65 Ø
0·66 E
Monofilament

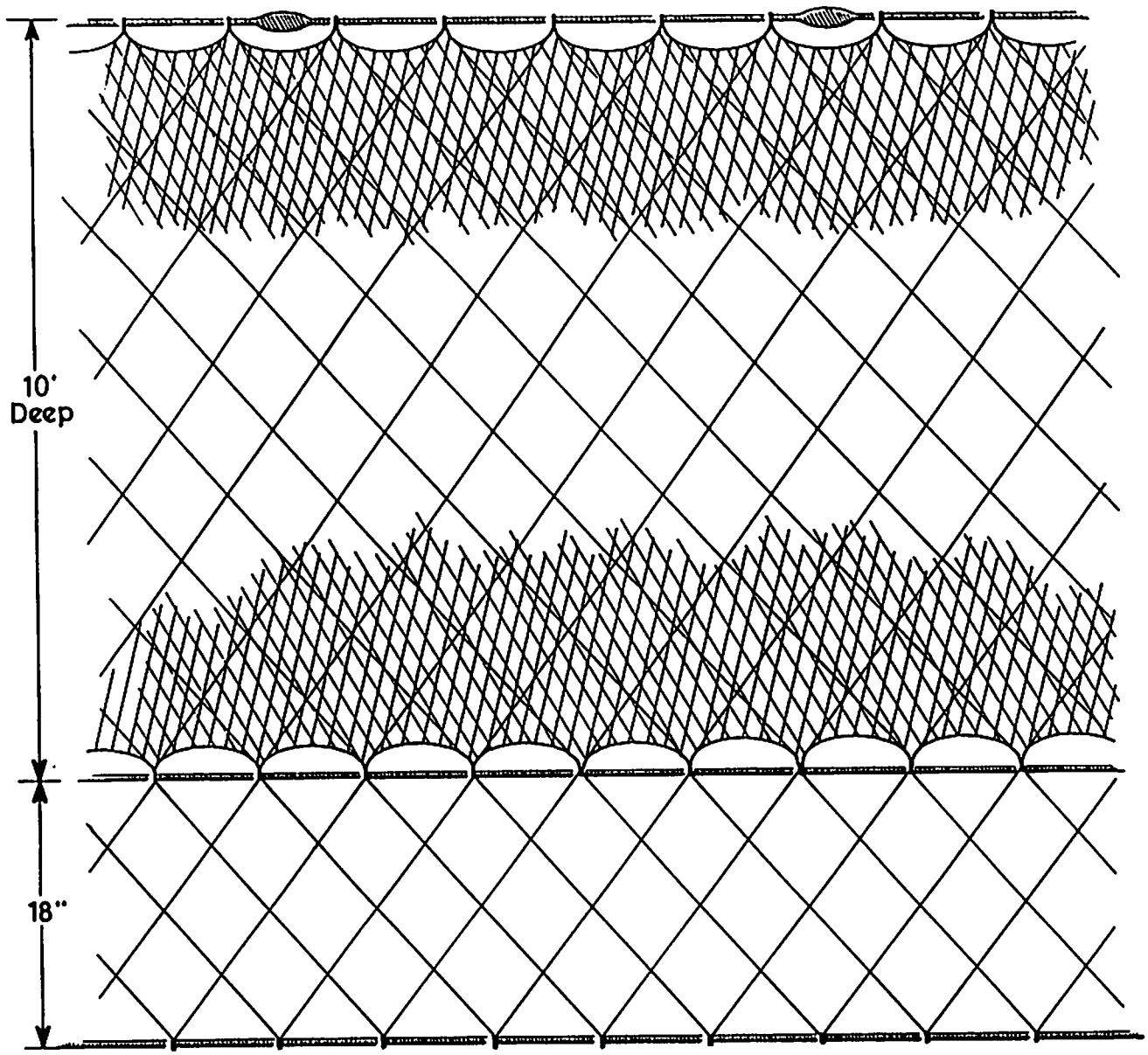
LINT 4½" Mesh

= 0·4 Ø
= 0·5 E
40 meshes deep

RIGGING

No. 6 Floatline
6mm. P.P. Backline
(6mm. P.P. Backline at foot of main net)
No. 3 Leadline

Fig. 1.



ARMOURING 8" Mesh

= 0·57 Ø
= 0·66 E
20 meshes deep

LINT $4\frac{1}{2}$" Mesh

= 0·4 Ø
= 0·5 E
40 meshes deep

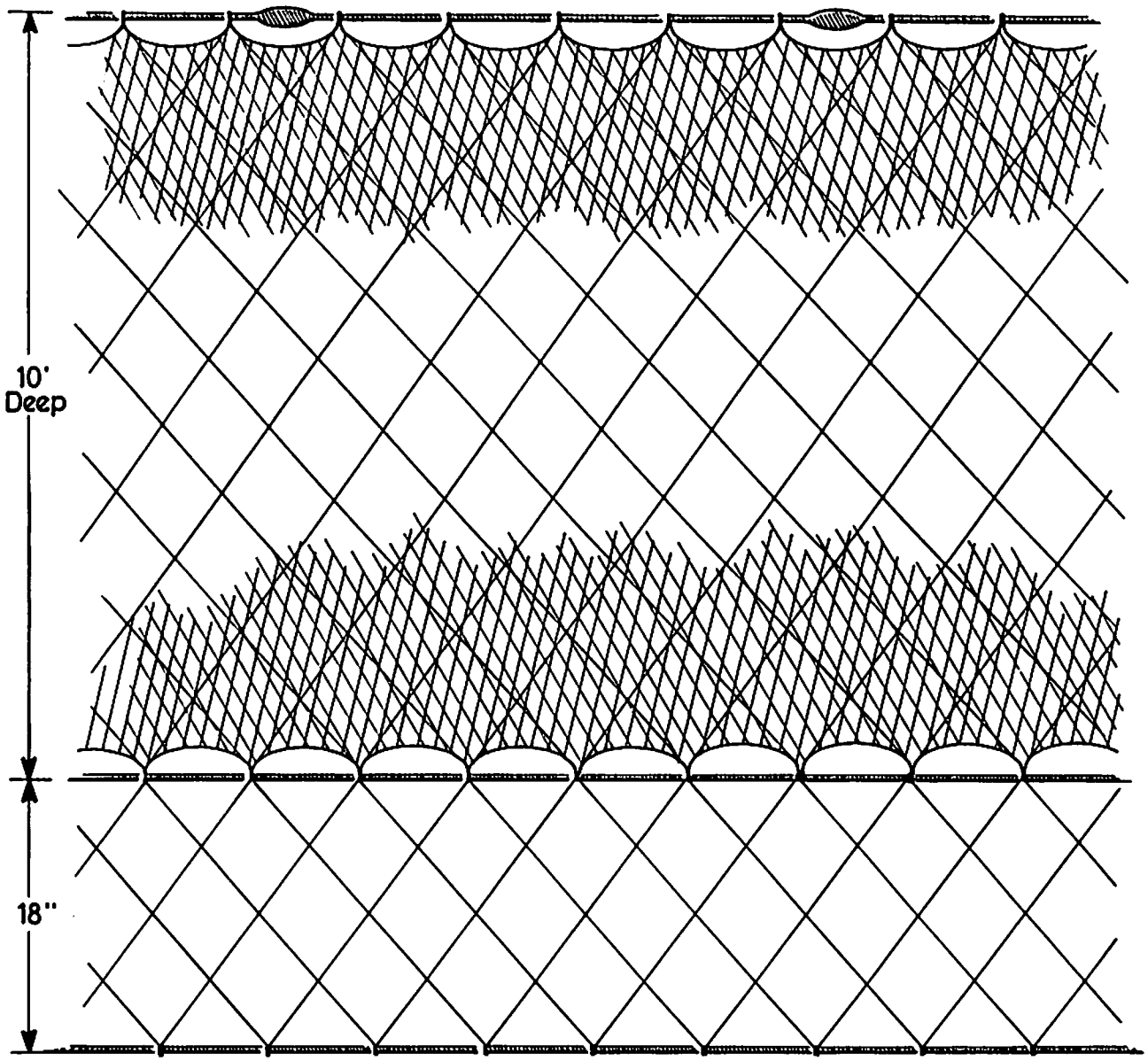
BARRIER 2. 12" Mesh

P.P. 170/36 (white)
0·66 E

RIGGING

No. 6 Floatline
6mm. P.P. Backline
(6mm. P.P. Backline at foot of main net)
No. 3 Leadline

Fig. 2.



ARMOURING 8" Mesh

= 0·57 Ø
= 0·66 E
20 meshes deep

BARRIER 2. 12" Mesh

P.P. 170/36 (white)
0·66 E

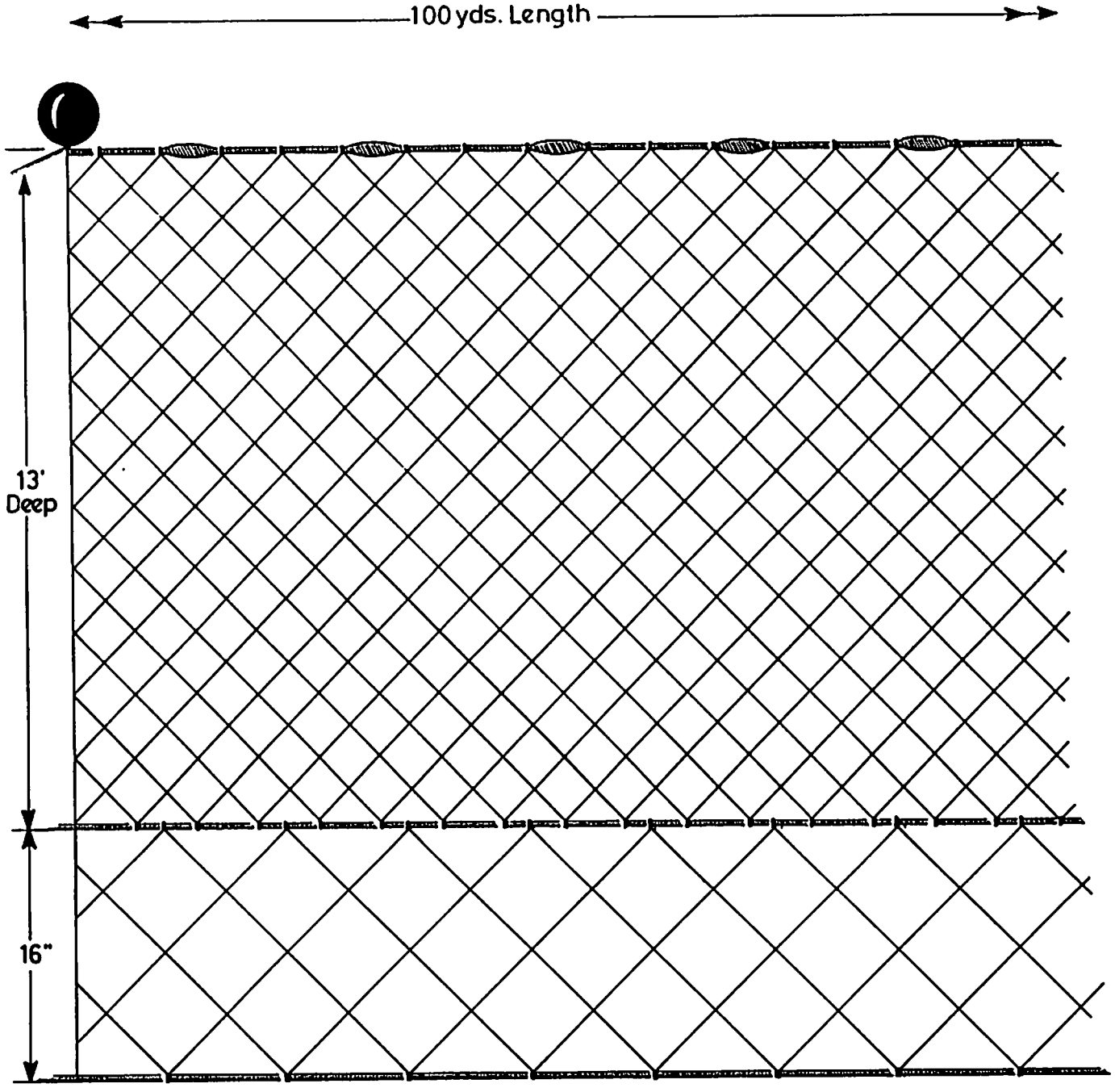
LINT 4½" Mesh

= 0·4 Ø
= 0·5 E
40 meshes deep

RIGGING

No. 6 Floatline
6mm. P.P. Backline
(6mm. P.P. Backline at foot of main net)
No. 3 Leadline

Fig. 3.



GILL NET $4\frac{1}{2}$" Mesh

= 0.4 Ø
= 0.5 E
40 meshes deep

BARRIER 2 $10\frac{1}{2}$" Mesh

= 0.65 Ø
= 0.66 E
Monofilament

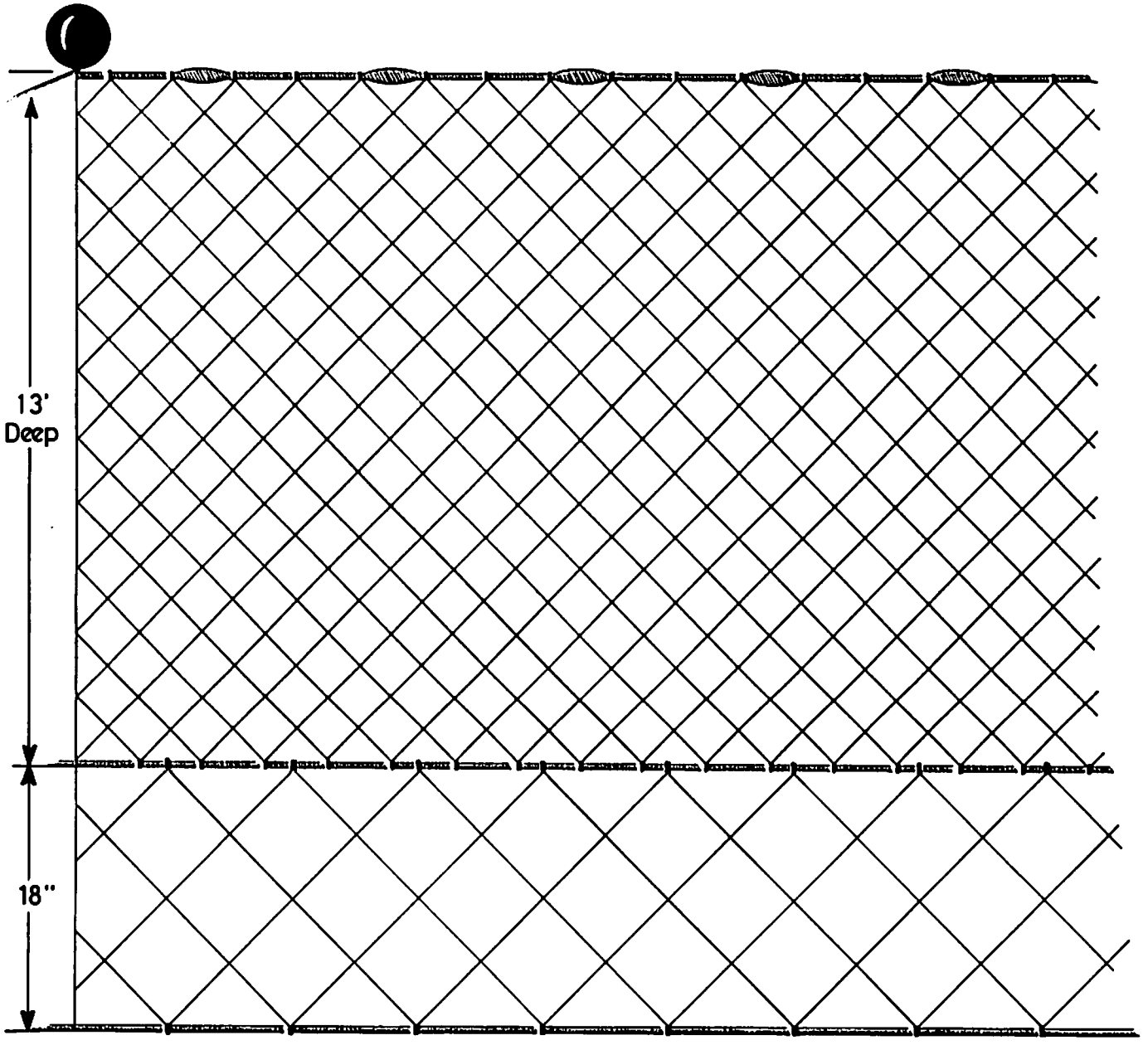
RIGGING

No. 6 Floatline
6 mm. P.P. Backline
No. 3 Leadline

(6mm P.P. Backline at foot of main net.)

Fig. 4.

As.



GILL NET 4½" Mesh

= 0·4 Ø
= 0·5 E
40 meshes deep

BARRIER 2 12" Mesh

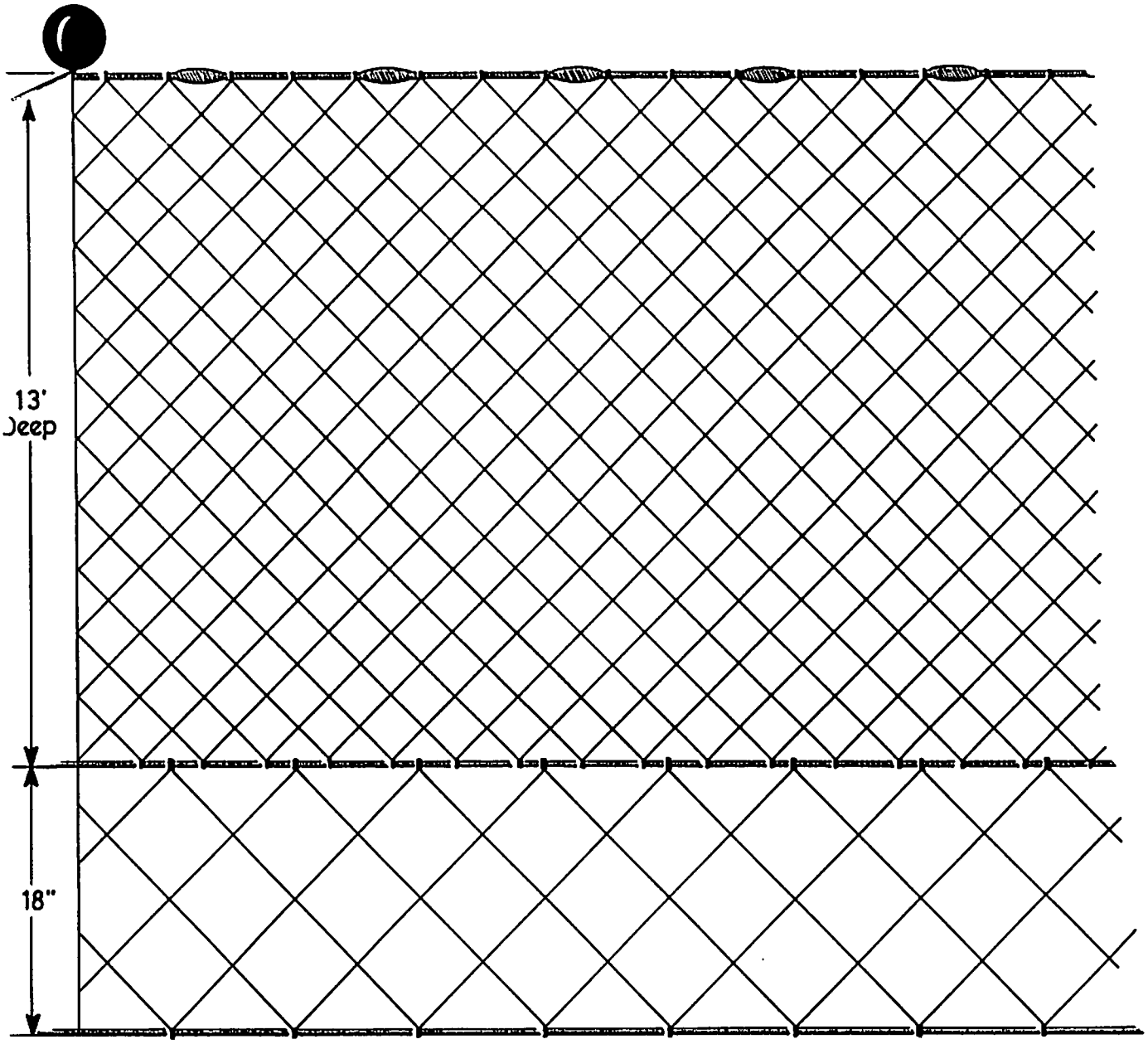
P.P. = 170/36 (white)
= 0·66 E

RIGGING

No. 6 Floatline
6mm. P.P. Backline
No. 3 Leadline

(6mm P.P. Backline at foot of main net.)

Fig. 5.



GILL NET 4½" Mesh

= 0·4 Ø
= 0·5 E
40 meshes deep

BARRIER 2 12" Mesh

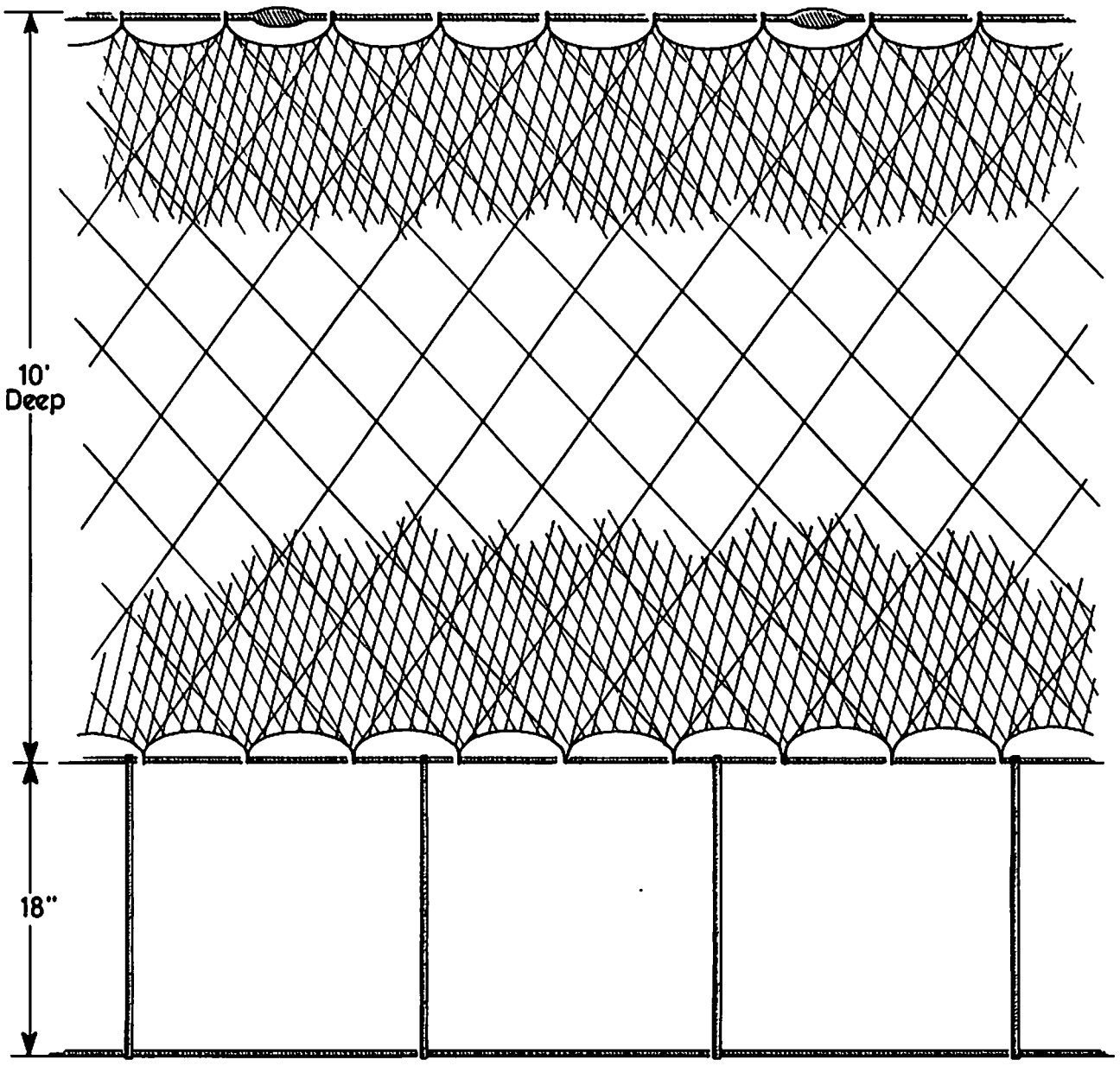
P.P. = 170/36 (dark)
= 0·66 E

RIGGING

No. 6 Floatline
6 mm. P.P. Backline
No. 3 Leadline

(6mm P.P. Backline at foot of main net.)

Fig. 6.



ARMOURING 8" Mesh

= 0·57 Ø
= 0·66 E
20 meshes deep

BARRIER

Length = 18"
Spacing = 18"

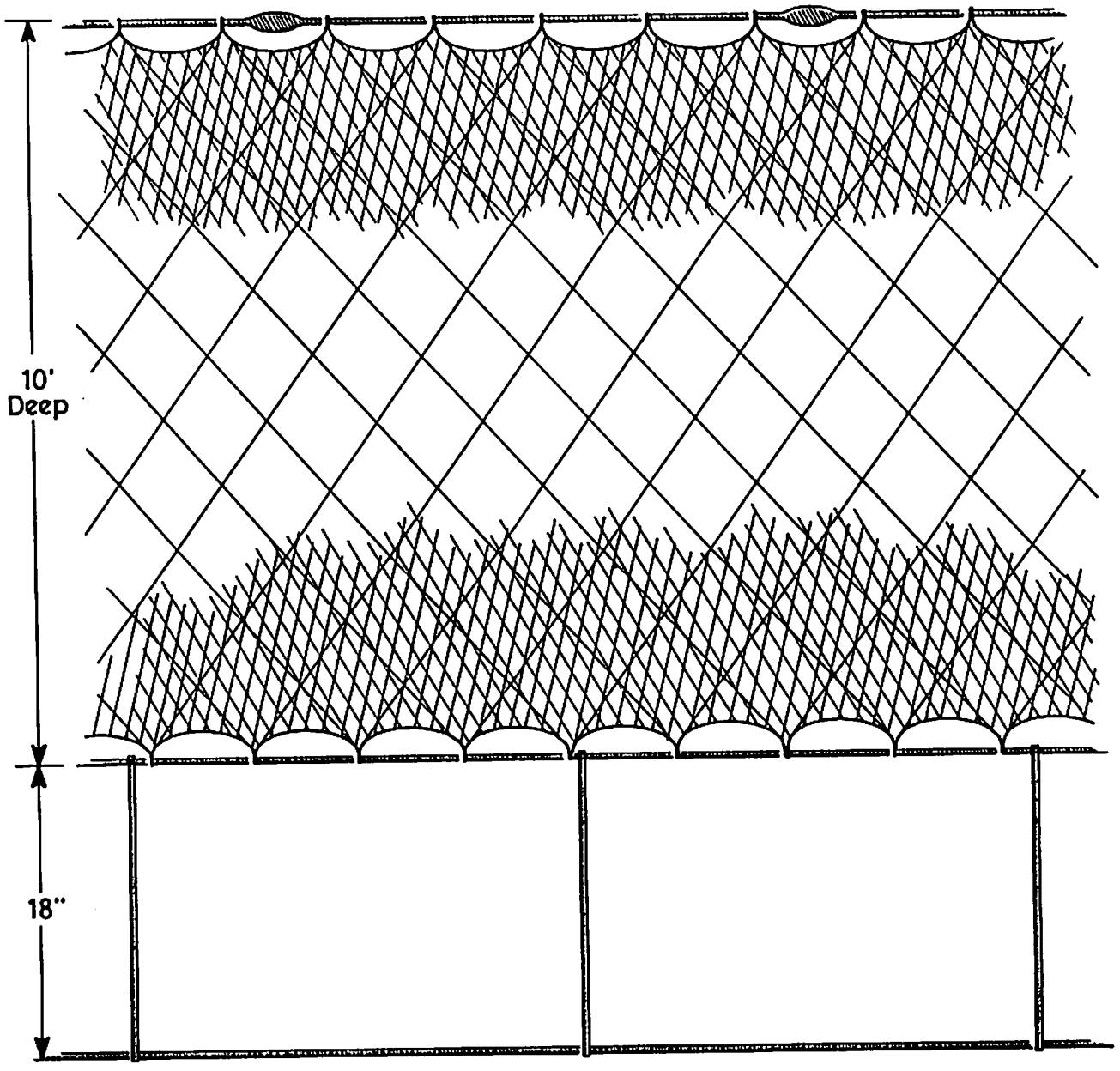
LINT $4\frac{1}{2}$" Mesh

= 0·4 Ø
= 0·5 E
40 meshes deep

RIGGING

No. 6 Floatline
6mm. P.P. Backline
(6mm. P.P. Backline at foot of main net)
No. 3 Leadline

Fig. 7.



ARMOURING 8" Mesh

= 0·57 Ø
= 0·66 E
20 meshes deep

LINT $4\frac{1}{2}$" Mesh

= 0·4 Ø
= 0·5 E
40 meshes deep

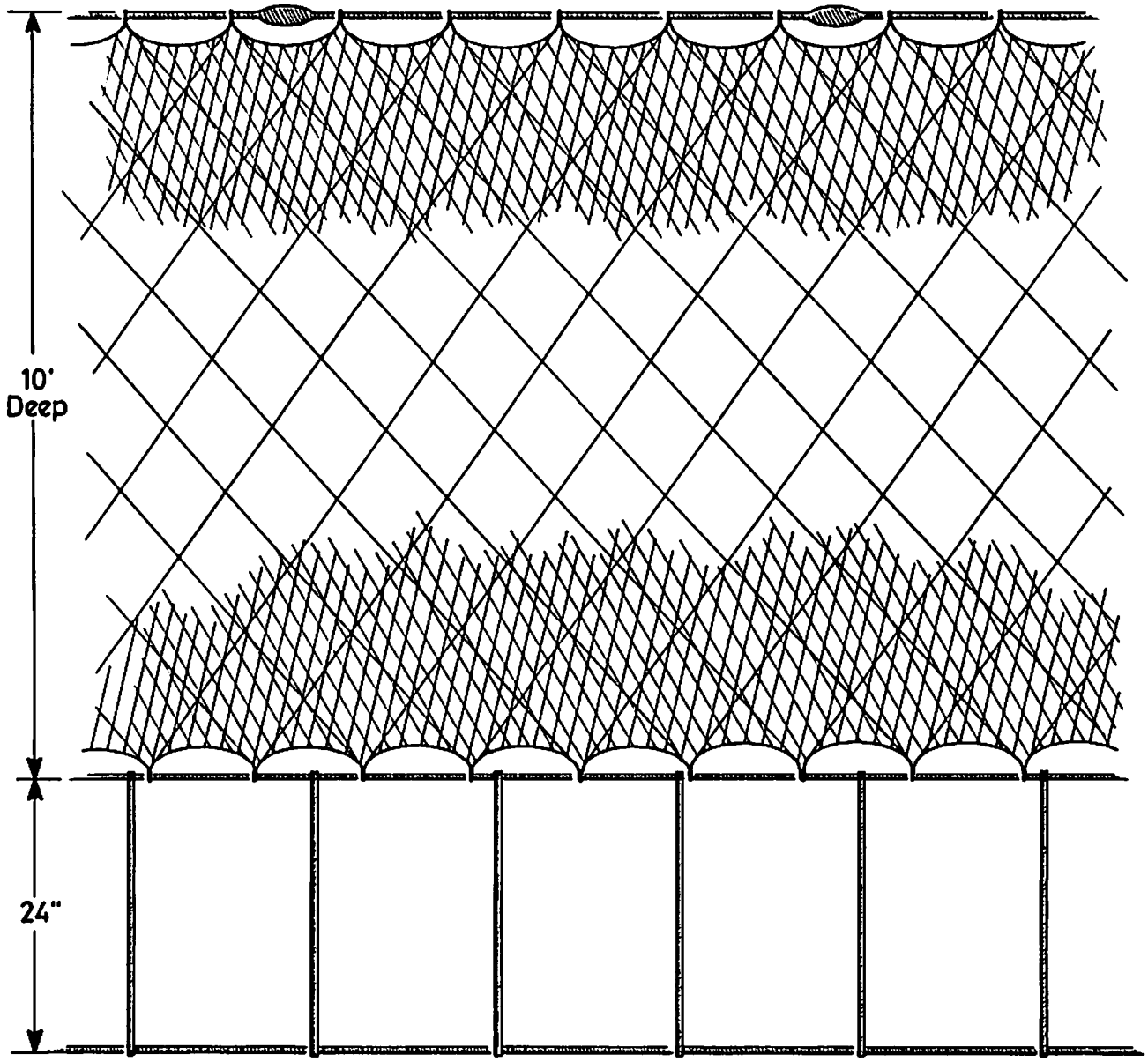
BARRIER

Length = 18"
Spacing = 36"

RIGGING

No. 6 Floatline
6mm. P.P. Backline
(6mm. P.P. Backline at foot of main net)
No. 3 Leadline

Fig. 8.



ARMOURING 8" Mesh

= 0·57 Ø
= 0·66 E
20 meshes deep

BARRIER

Length = 24"
Spacing = 18"

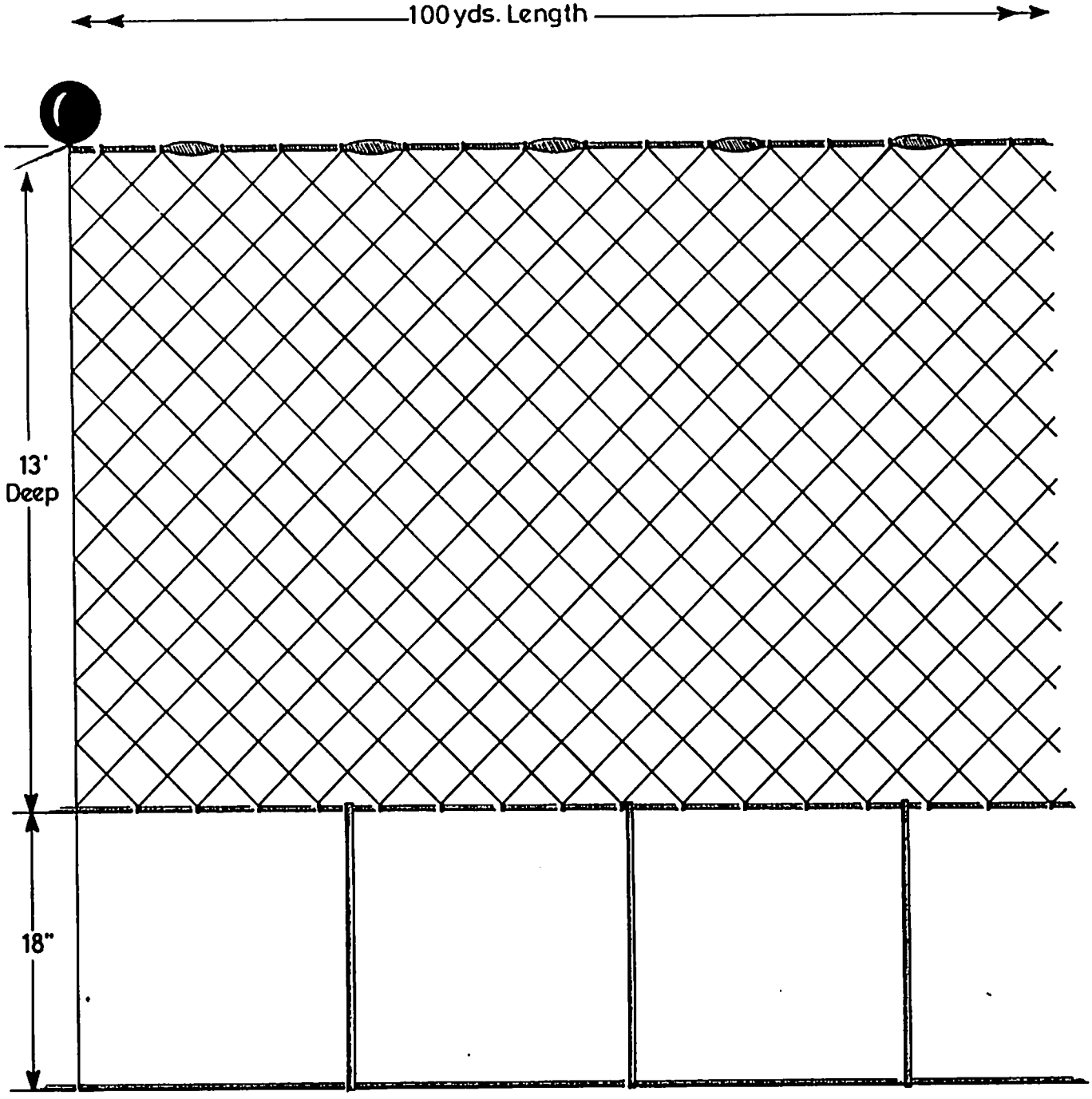
LINT $4\frac{1}{2}$" Mesh

= 0·4 Ø
= 0·5 E
40 meshes deep

RIGGING

No. 6 Floatline
6mm. P.P. Backline
(6mm. P.P. Backline at foot of main net)
No. 3 Leadline

Fig. 9.



GILL NET 4½" Mesh

= 0.4 Ø
= 0.5 E
40 meshes deep

BARRIER

Length = 18"
Spacing = 18"

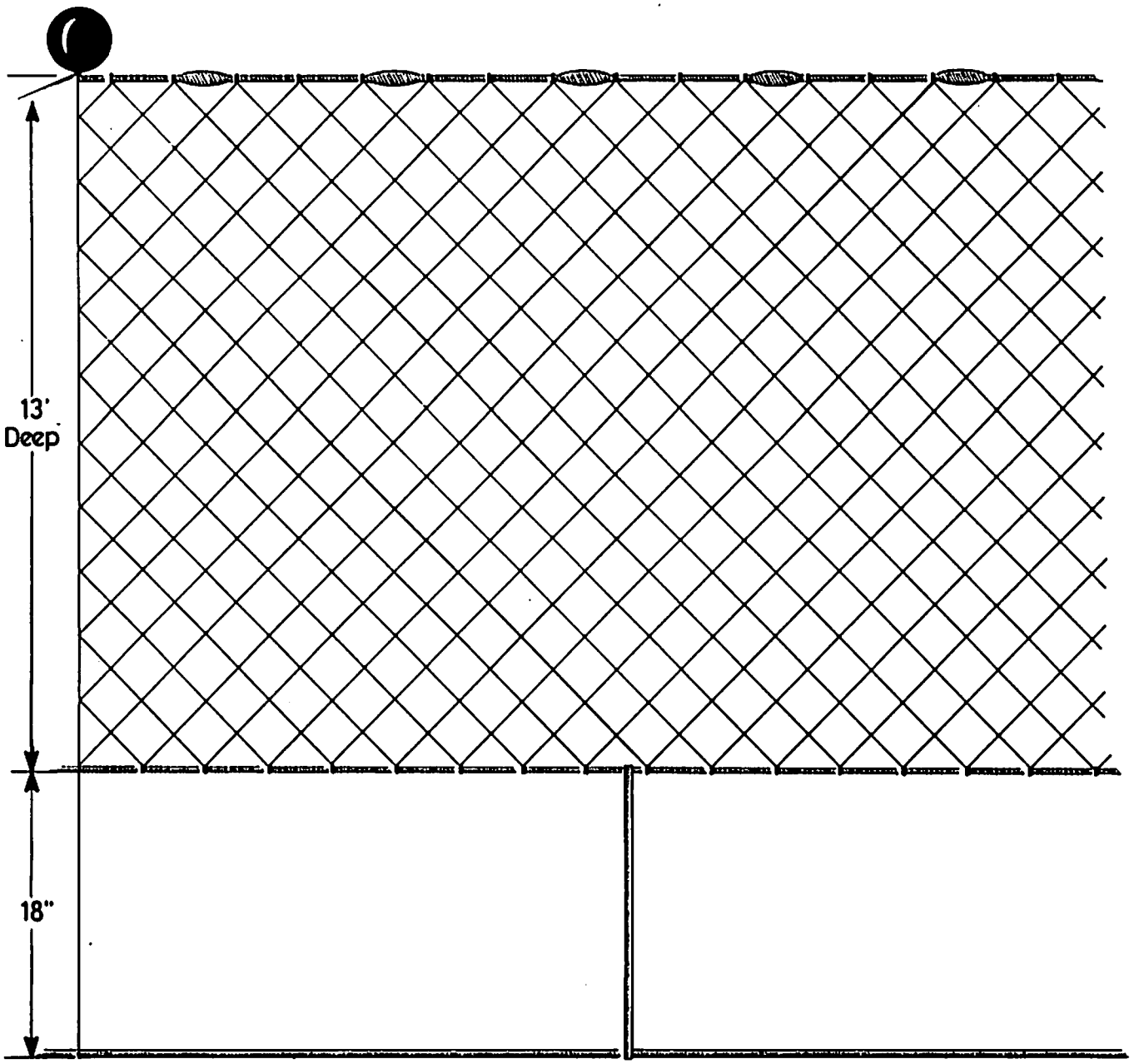
RIGGING

No. 6 Floatline
6 mm. P.P. Backline
No. 3 Leadline

(6mm P.P. Backline at foot of main net.)

Fig. 10.

Bs.



GILL NET 4½" Mesh

= 0·4 Ø
= 0·5 E
40 meshes deep

BARRIER

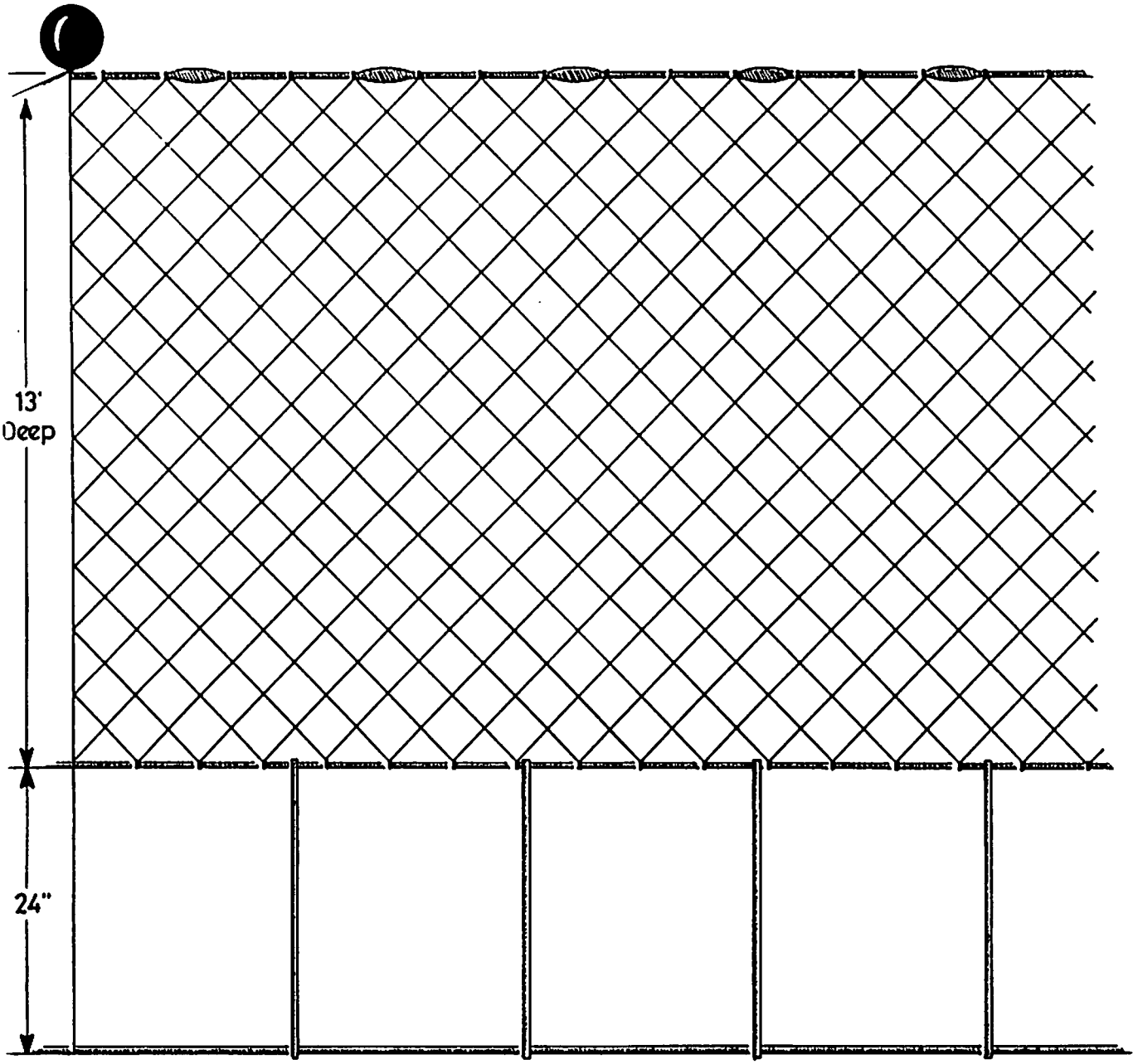
Length = 18"
Spacing = 36"

RIGGING

No. 6 Floatline
6 mm. P.P. Backline
No. 3 Leadline

(6mm P.P. Backline at foot of main net.)

Fig. 11.



GILL NET 4½" Mesh

= 0·4 Ø
= 0·5 E
40 meshes deep

BARRIER

Length = 24"
Spacing = 18"

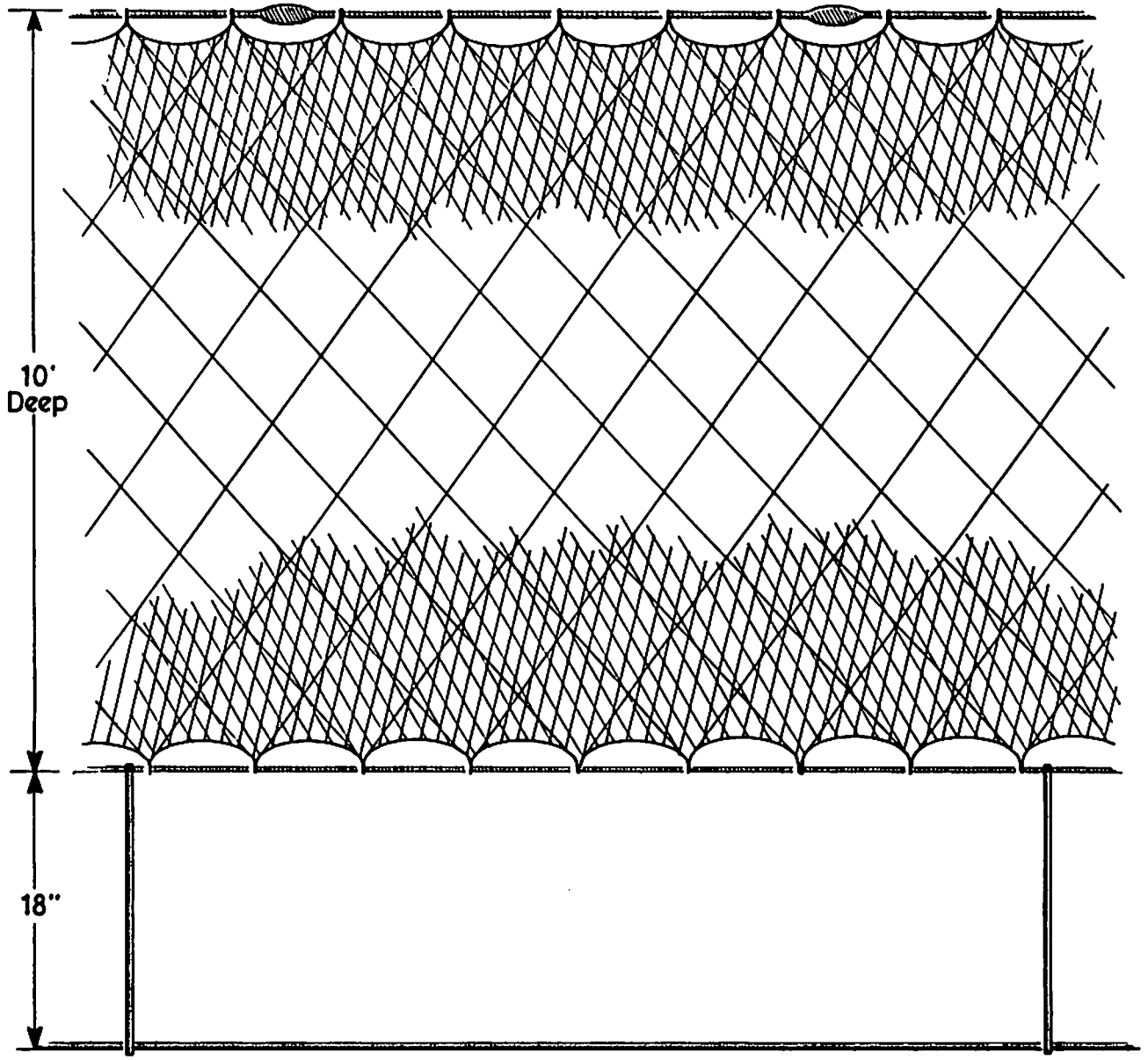
RIGGING

No. 6 Floatline
6 mm. P.P. Backline
No. 3 Leadline

(6mm P.P. Backline at foot of main net.)

Fig. 12.

C_1. (A7 IN SECOND RIGGING SEQUENCE).



ARMOURING 8" Mesh

= 0·57 Ø
= 0·66 E
20 meshes deep

LINT 4½" Mesh

= 0·4 Ø
= 0·5 E
40 meshes deep

BARRIER

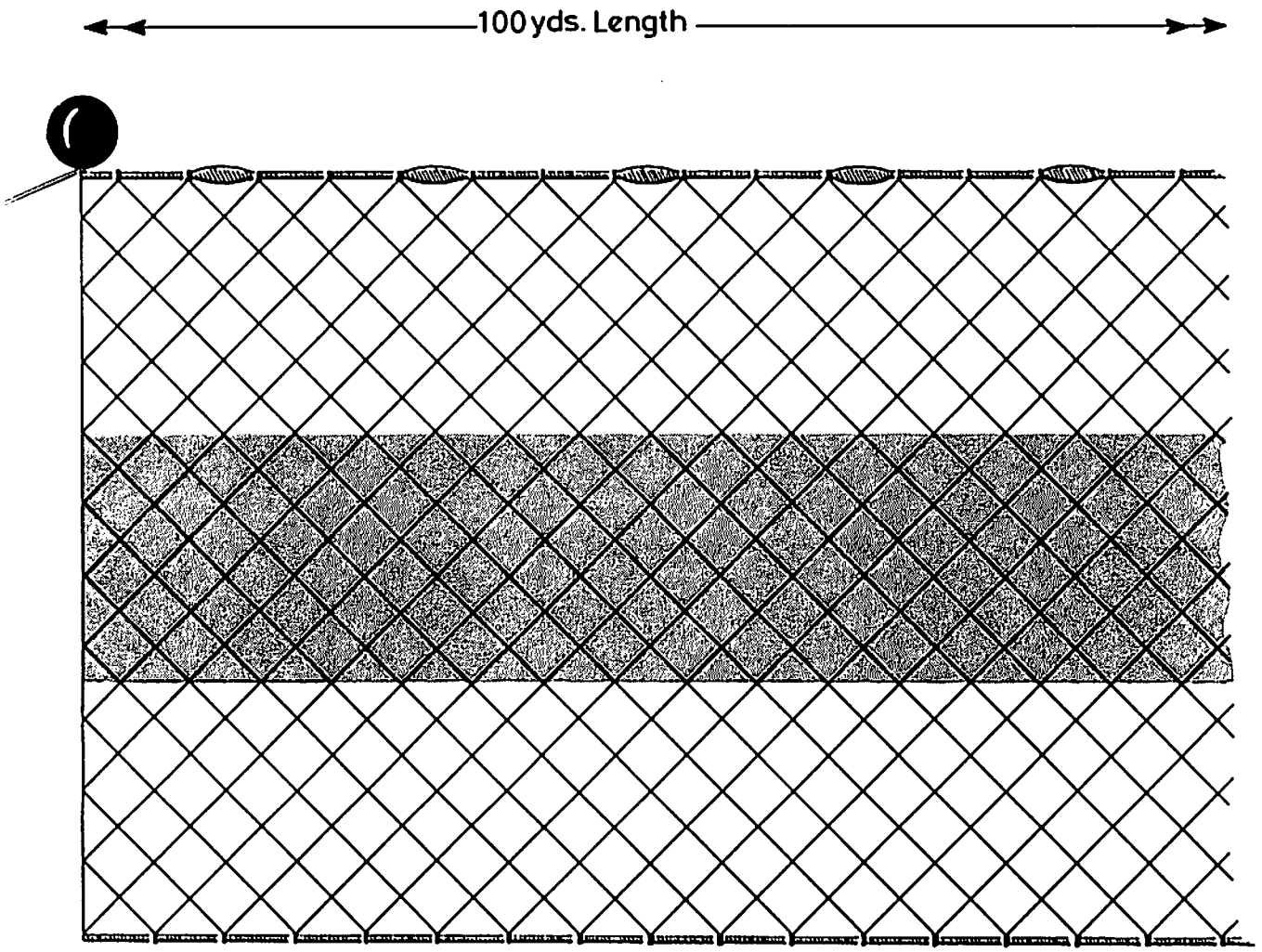
3 Bridle Rig with no Strops or Barrier
(Strops every 3 fathoms, joining Leadline to net.)

RIGGING

No. 6 Floatline
6mm. P.P. Backline
(6mm. P.P. Backline at foot of main net)
No. 3 Leadline

Fig. 13.

C_2 (C_1 IN SECOND RIGGING SEQUENCE)



GILLNET 4" Mesh

Nylon = 210 / 9
= 0·5 E
40 meshes deep

BARRIER

No Barriers
No 3 Bridle Setup
Top 1/3 of Net: Light
Middle 1/3 of Net: Dark
Bottom 1/3 of Net: Light

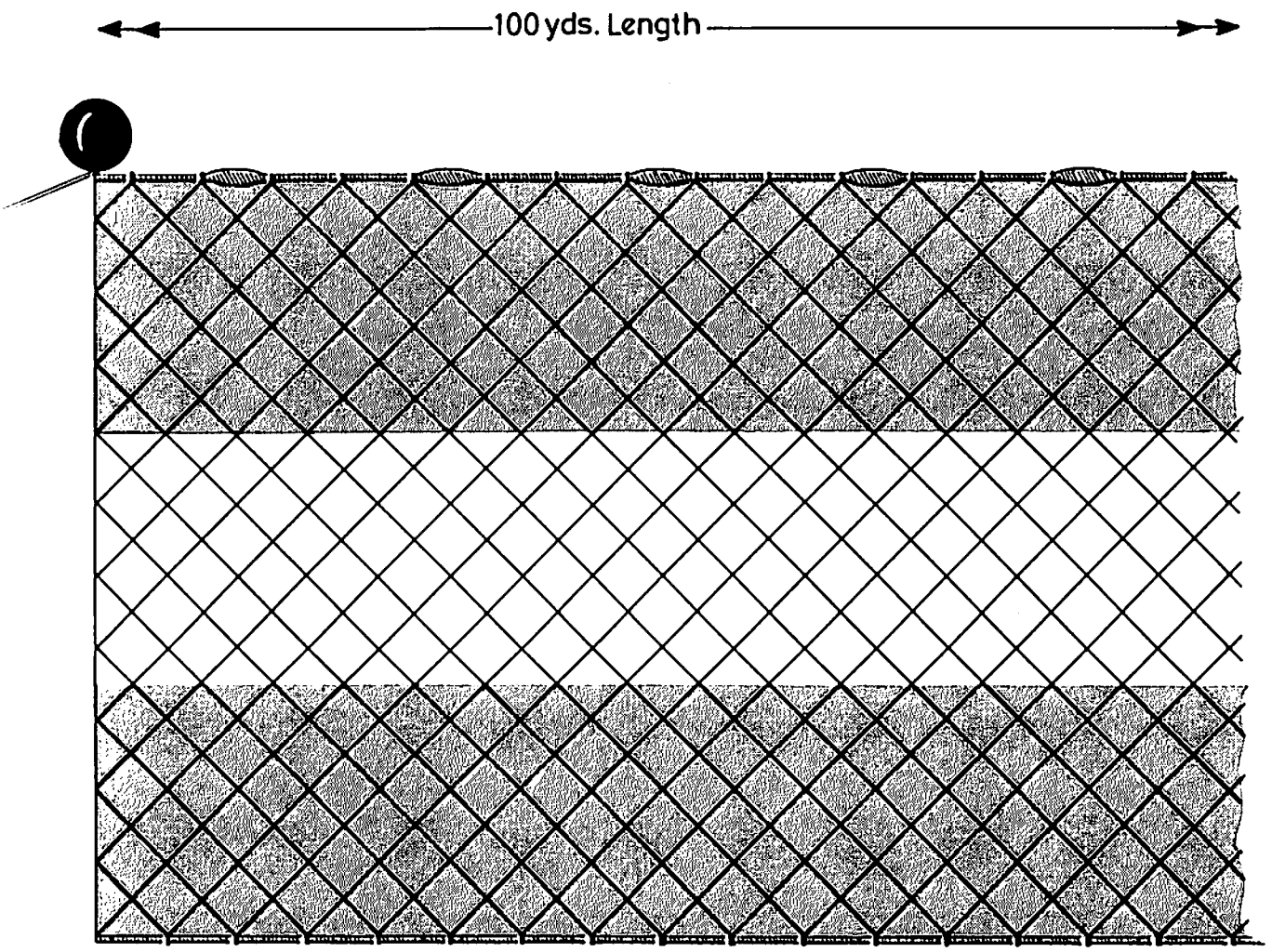
RIGGING

No. 6 Floatline
6 mm P.P. Backline
No. 3 Leadline

Gill Net Contrast Rig

Fig. 14.

C_3 (C_1 IN SECOND RIGGING SEQUENCE)



GILLNET 5" Mesh

Nylon = 210/9
= 0·5 E
40 meshes deep

BARRIER

No Barriers
No 3 Bridle Setup
Top 1/3 of Net : Dark
Middle 1/3 of Net : Light
Bottom 1/3 of Net : Dark

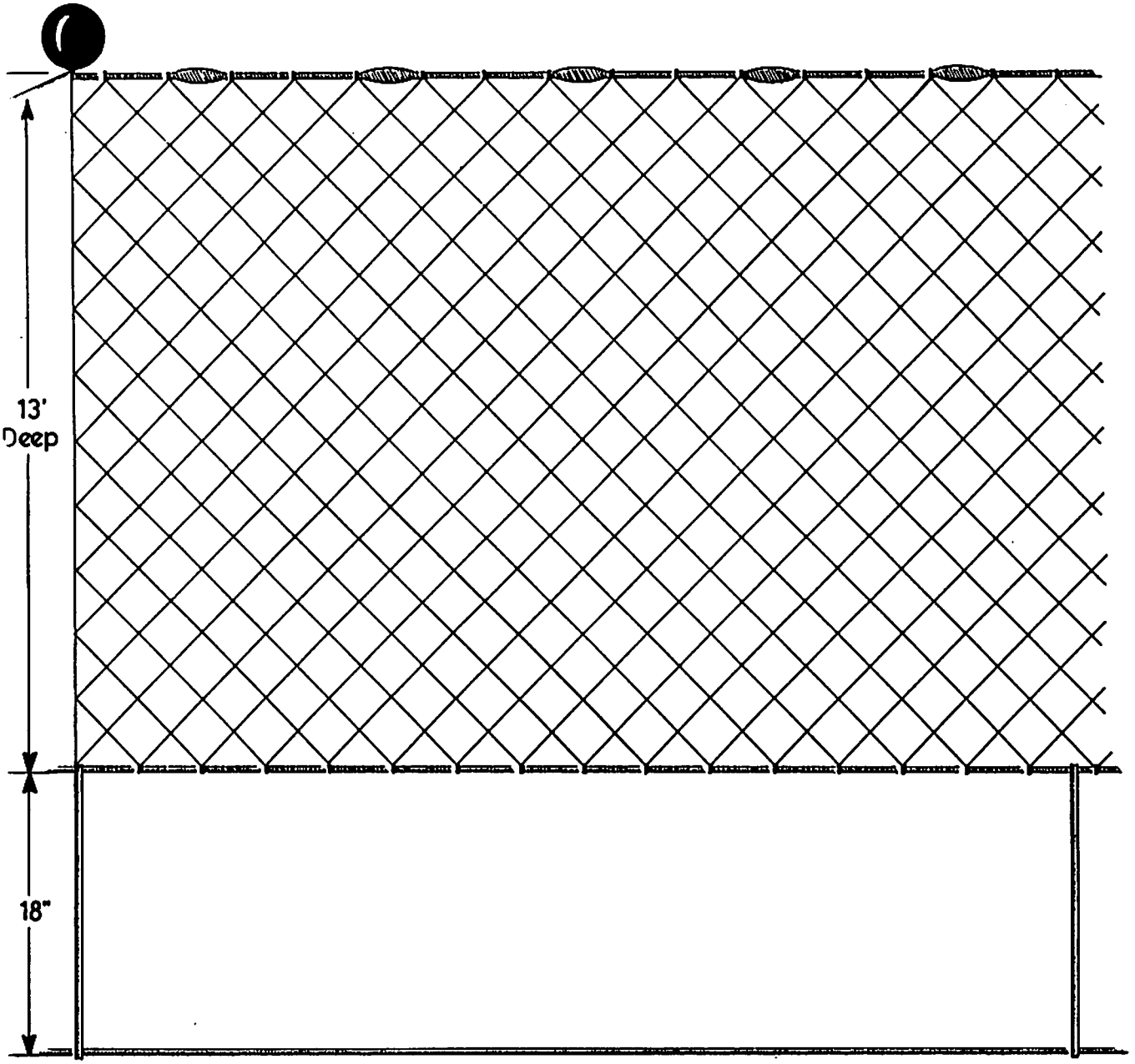
RIGGING

No. 6 Floatline
6 mm P.P. Backline
No. 3 Leadline

Gill Net Contrast Rig

Fig. 15.

C4. (B7 IN SECOND RIGGING SEQUENCE)



GILL NET 4½" Mesh

= 0.4 Ø
= 0.5 E
40 meshes deep

BARRIER

3 Bridle Rig with no Strops or Barriers
(Strops every 3 fathoms, joining Leadline to net.)

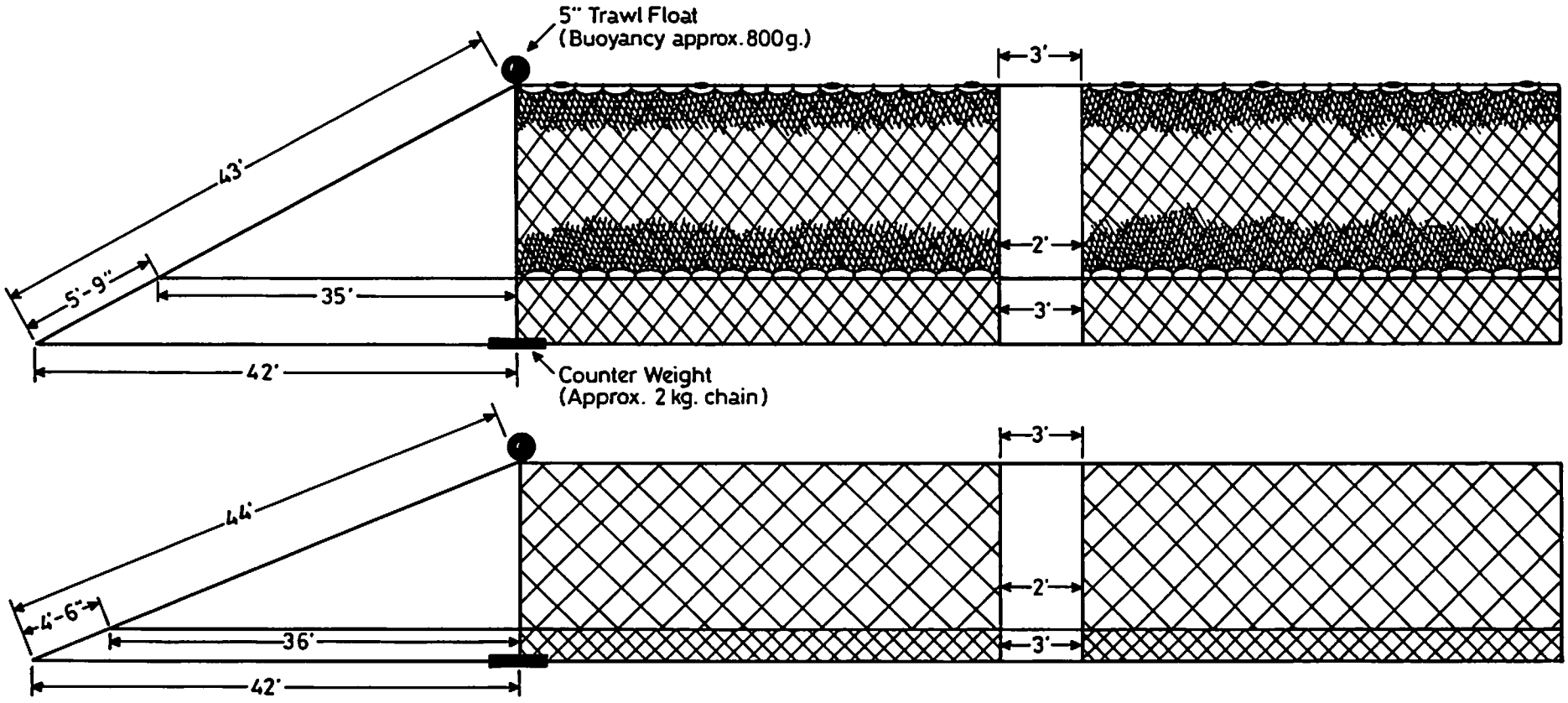
RIGGING

No. 6 Floatline
6mm. P.P. Backline
No. 3 Leadline

(6mm P.P. Backline at foot of main net.)

Fig. 16.

3 - Bridle Arrangement for Trammel Nets



3 - Bridle Arrangement for Gill Net

NOTE: The middle bridle includes an allowance of approx. 18" (tight) to take the strain, allowing strops and barrier strip to stand vertically.

NOT TO SCALE

3 - Bridle Arrangement for Trammel & Gill Nets

Fig. 17.

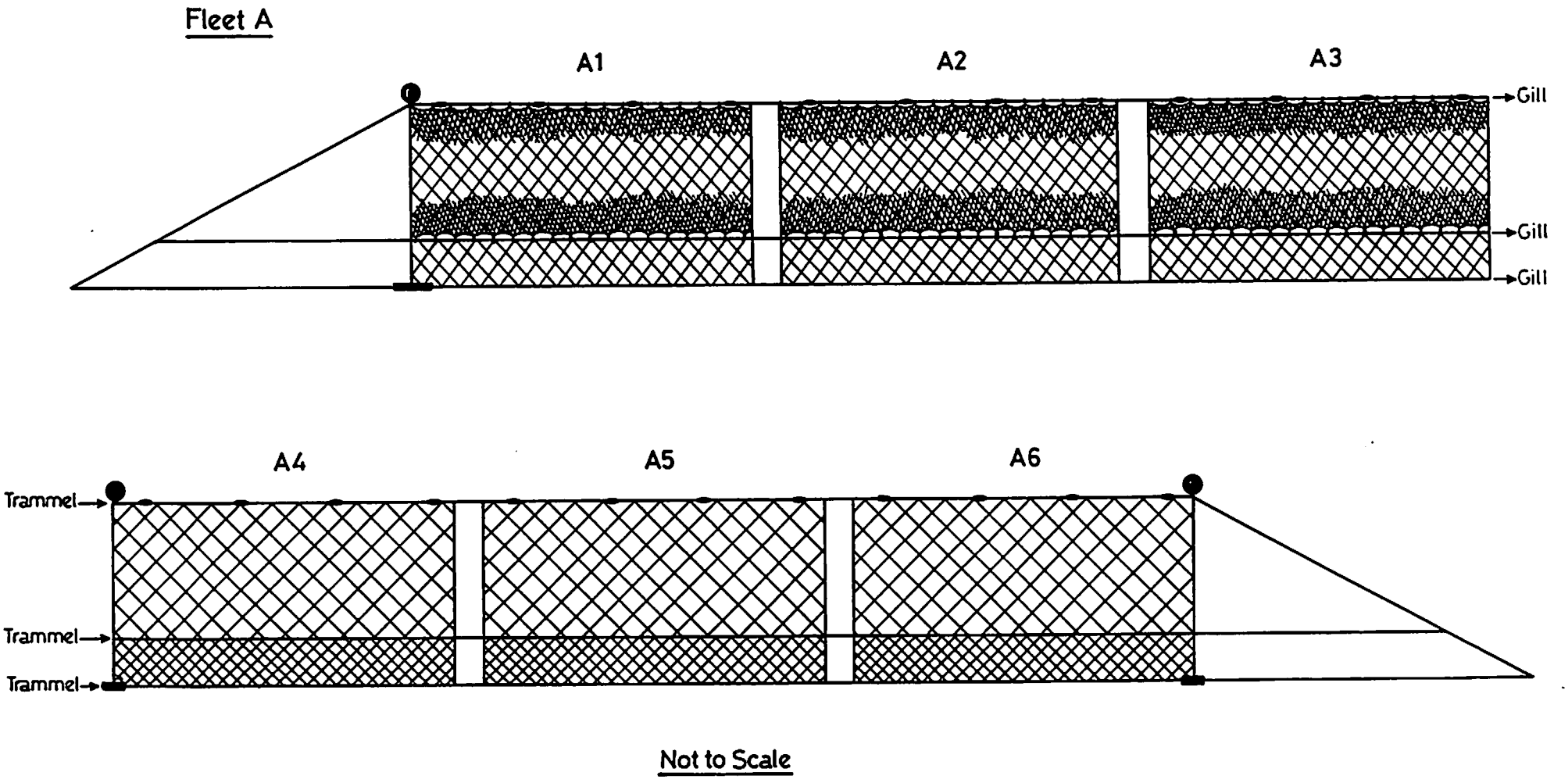


Diagram Showing Rigging Sequence of Experimental Fleet (A)

Fig. 18.

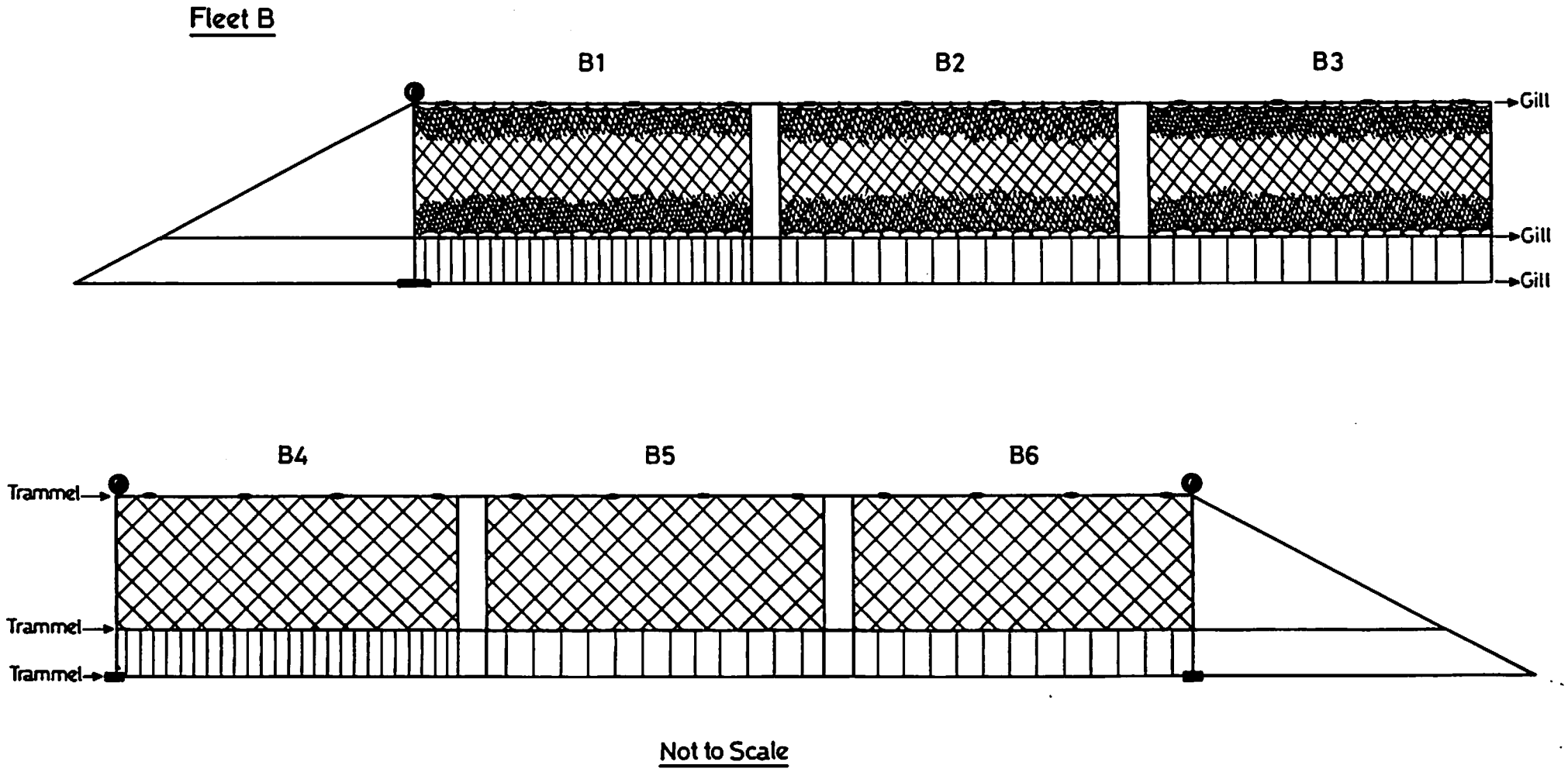


Diagram Showing Rigging Sequence of Experimental Fleet (B)

Fig. 19.

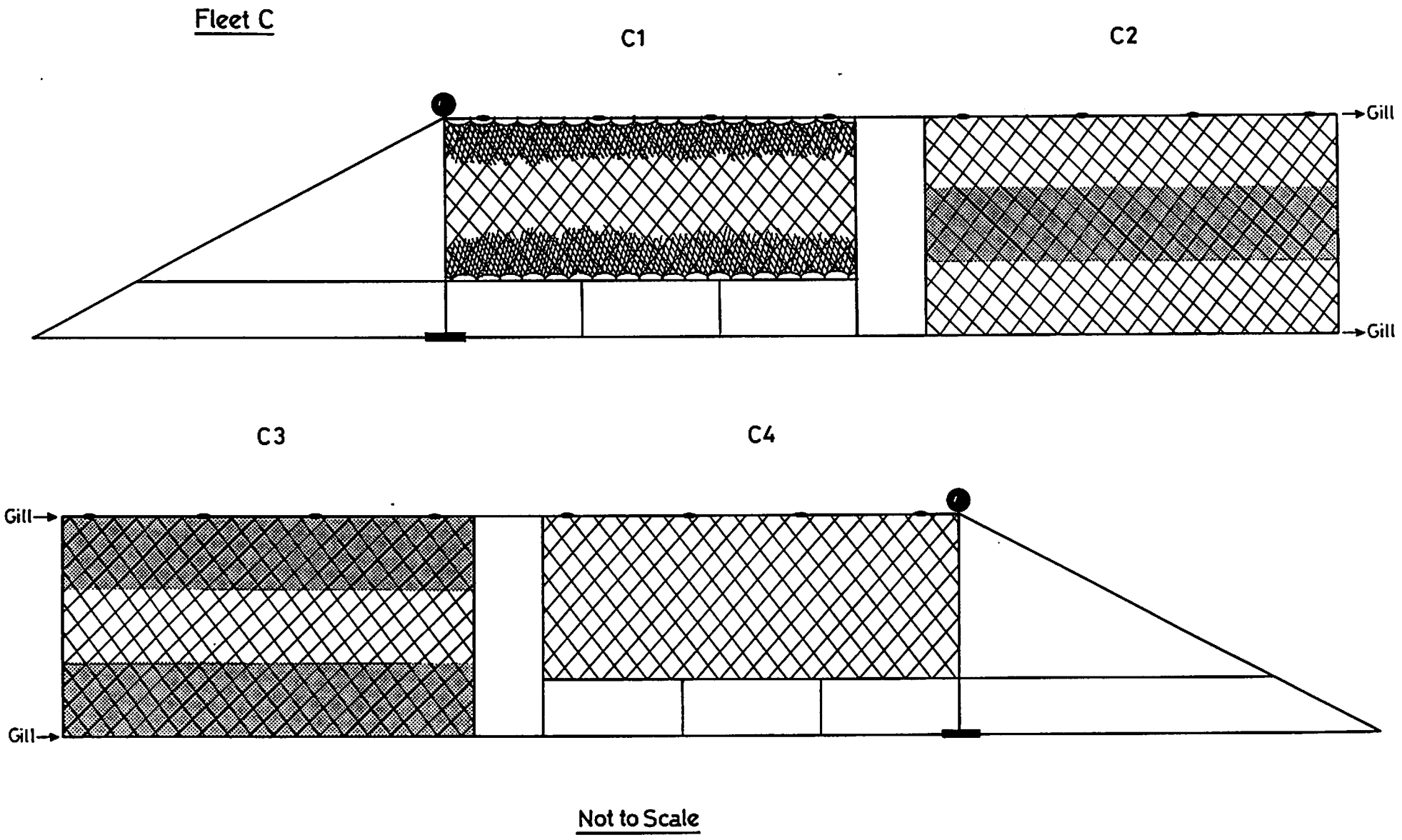
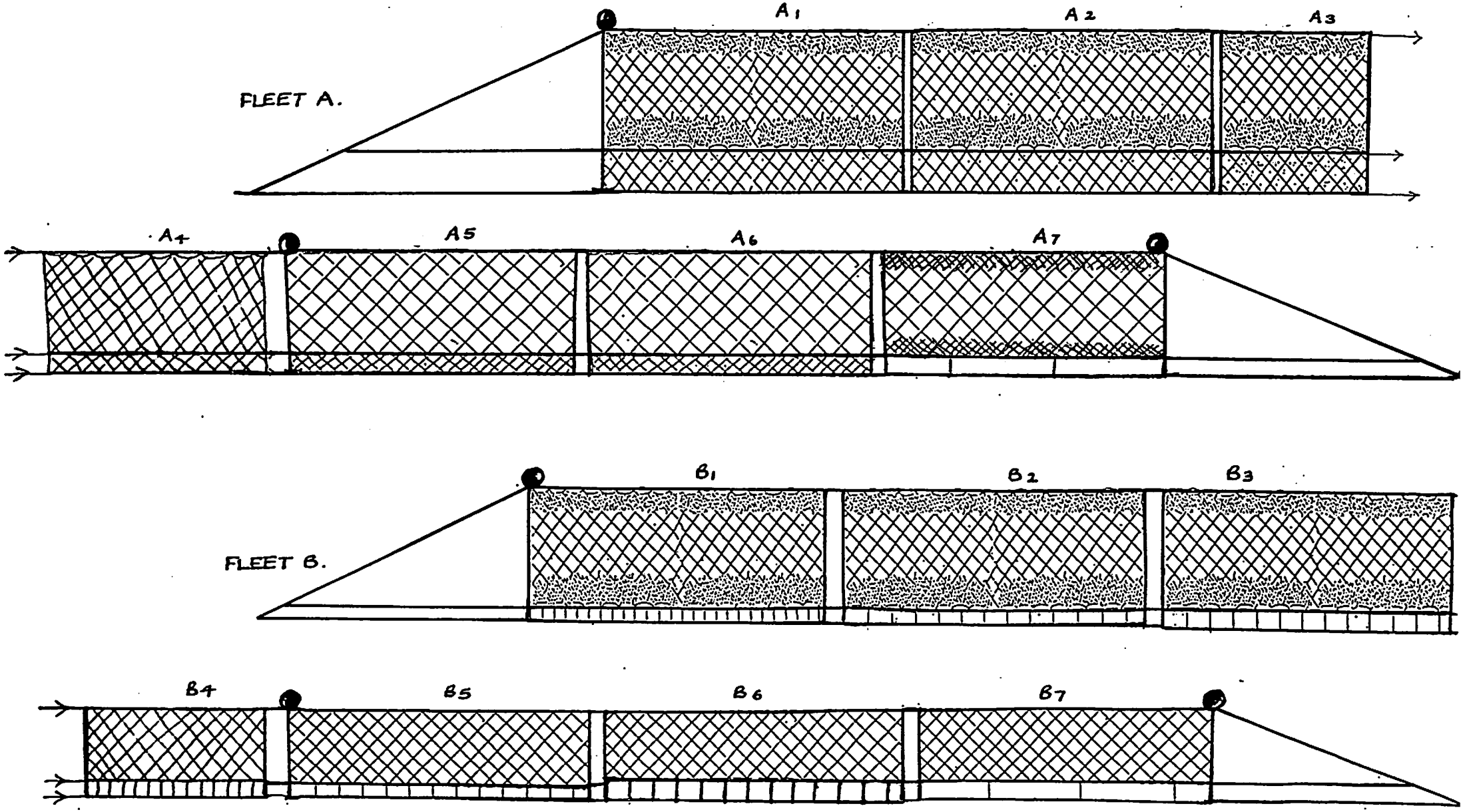
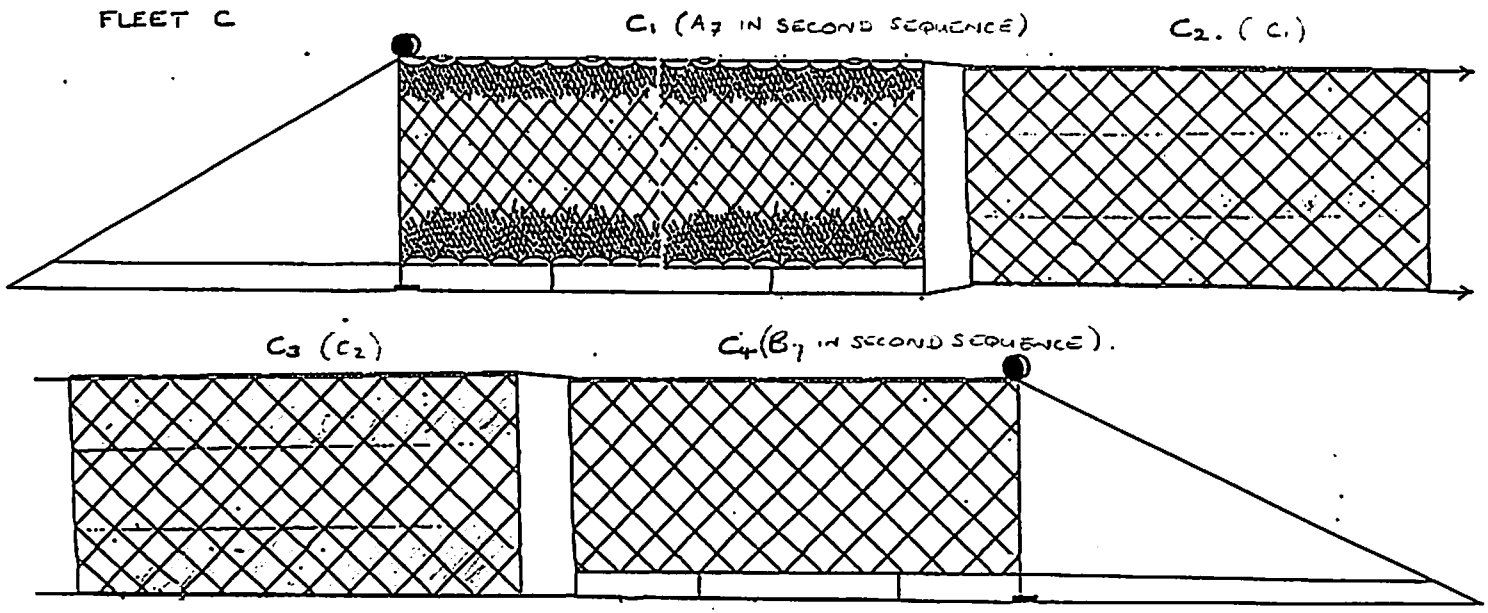


Diagram Showing Rigging Sequence of Experimental Fleet (C)

Fig. 20.

Diagram Showing Rigging Sequence of Experimental Fleets (second Trial) Fig. 21

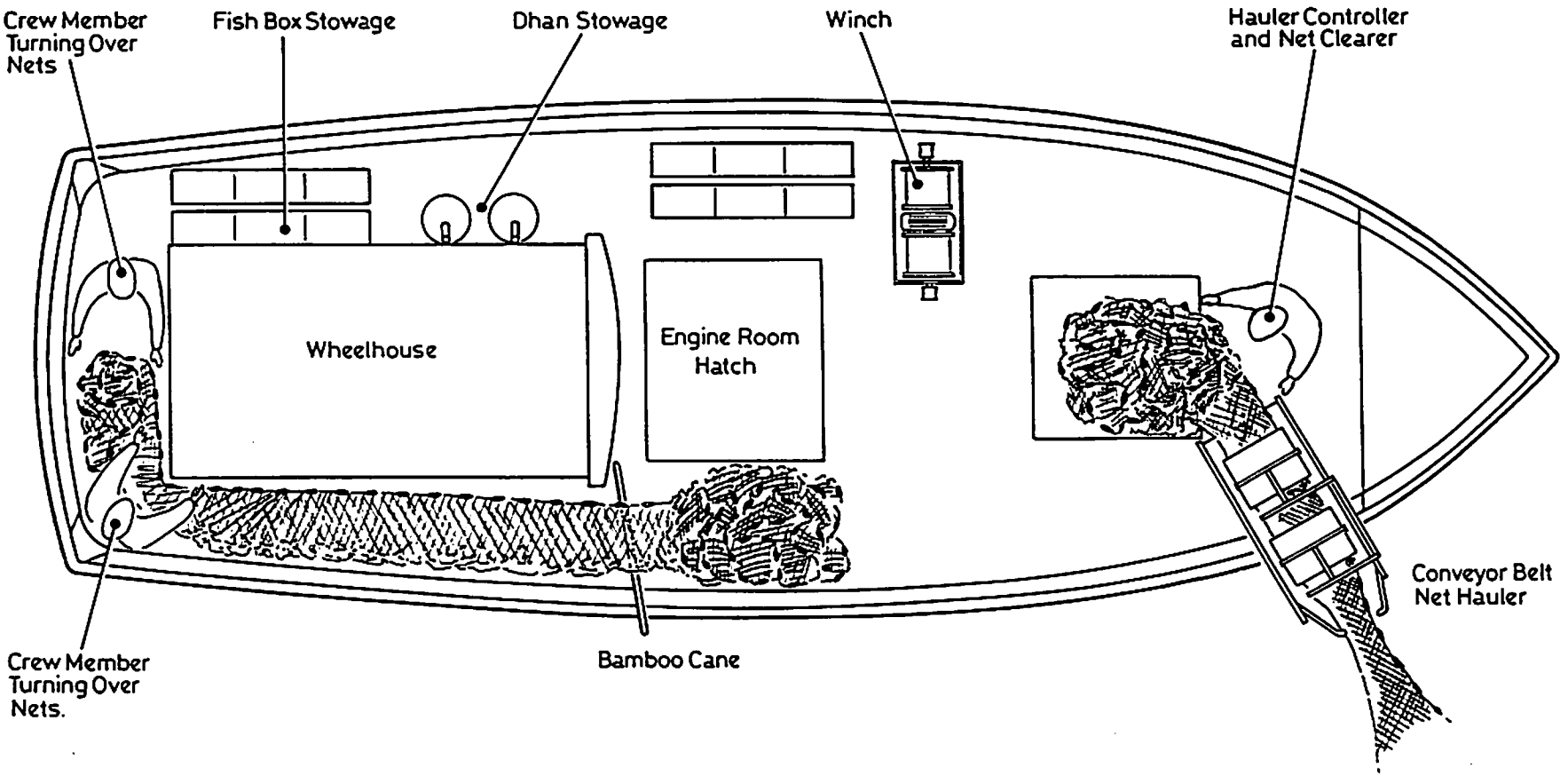




DIAGRAMS SHOWING RIGGING SEQUENCE OF EXPERIMENTAL FLEETS

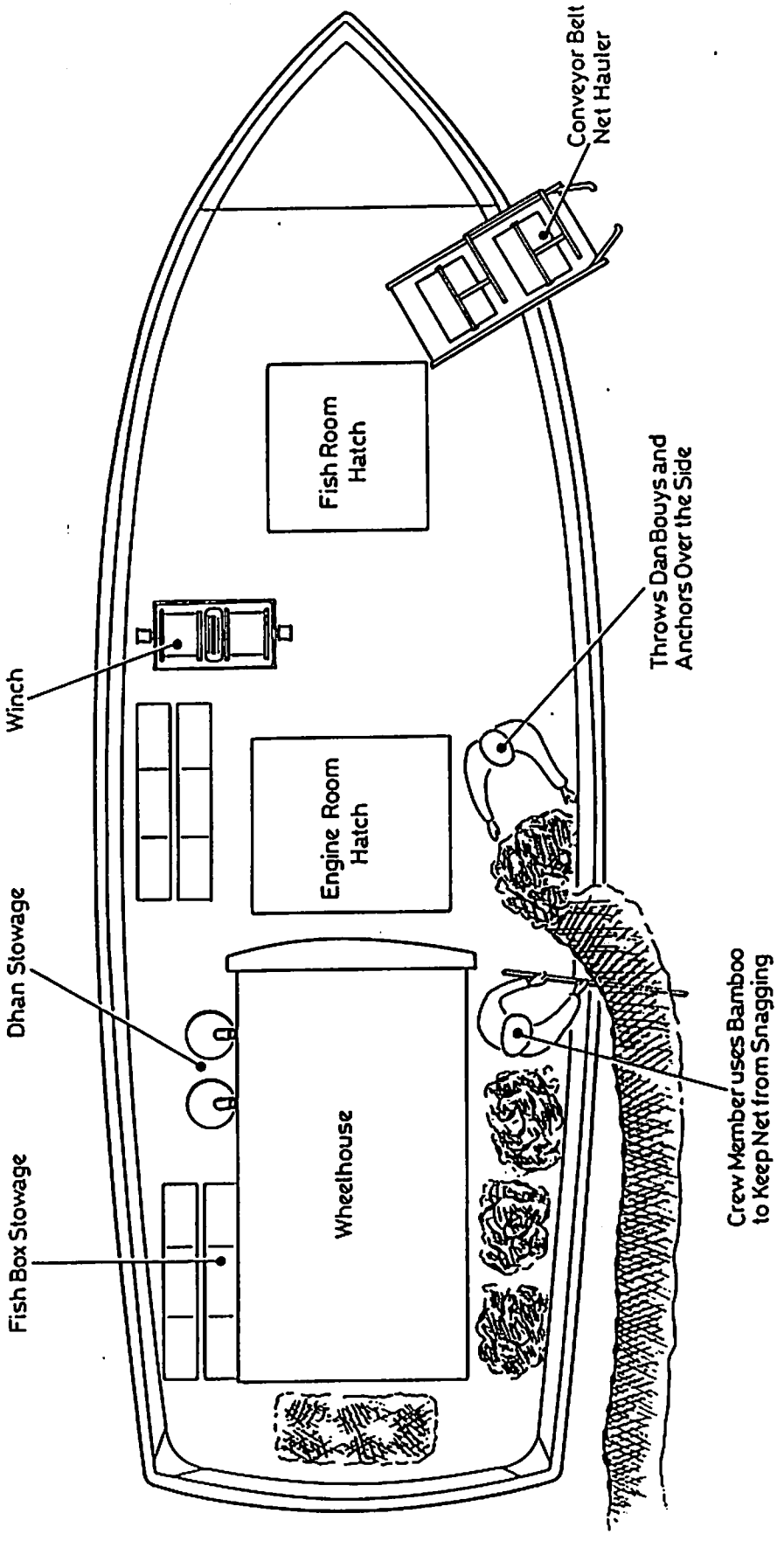
Key

A_1 - Trammel net with mono mesh barrier strip
A_2 - Trammel net with white P.P. mesh barrier strip
A_3 - Trammel net with dark P.P. mesh barrier strip
A_4 - Gill net with mono mesh barrier strip
A_5 - Gill net with white P.P. mesh barrier strip
A_6 - Gill net with dark P.P. mesh barrier strip
B_1 - Trammel net with strop barrier strip - 18"↑ x $\overrightarrow{18"}$
B_2 - Trammel net with strop barrier strip - 18"↑ x $\overrightarrow{36"}$
B_3 - Trammel net with strop barrier strip - 24"↑ x $\overrightarrow{18"}$
B_4 - Gill net with strop barrier strip - 18"↑ x $\overrightarrow{18"}$
B_5 - Gill net with strop barrier strip - 18"↑ x $\overrightarrow{36"}$
B_6 - Gill net with strop barrier strip - 24"↑ x $\overrightarrow{18"}$
C_1 - Trammel net with 18" strops at 3 fathom spacings
C_2 - Gill net with contrast sections - light - dark - light
C_3 - Gill net with contrast sections - dark - light - dark
C_4 - Gill net with 18" strops at 3 fathom spacings



Turning Over of Nets

Fig. 25

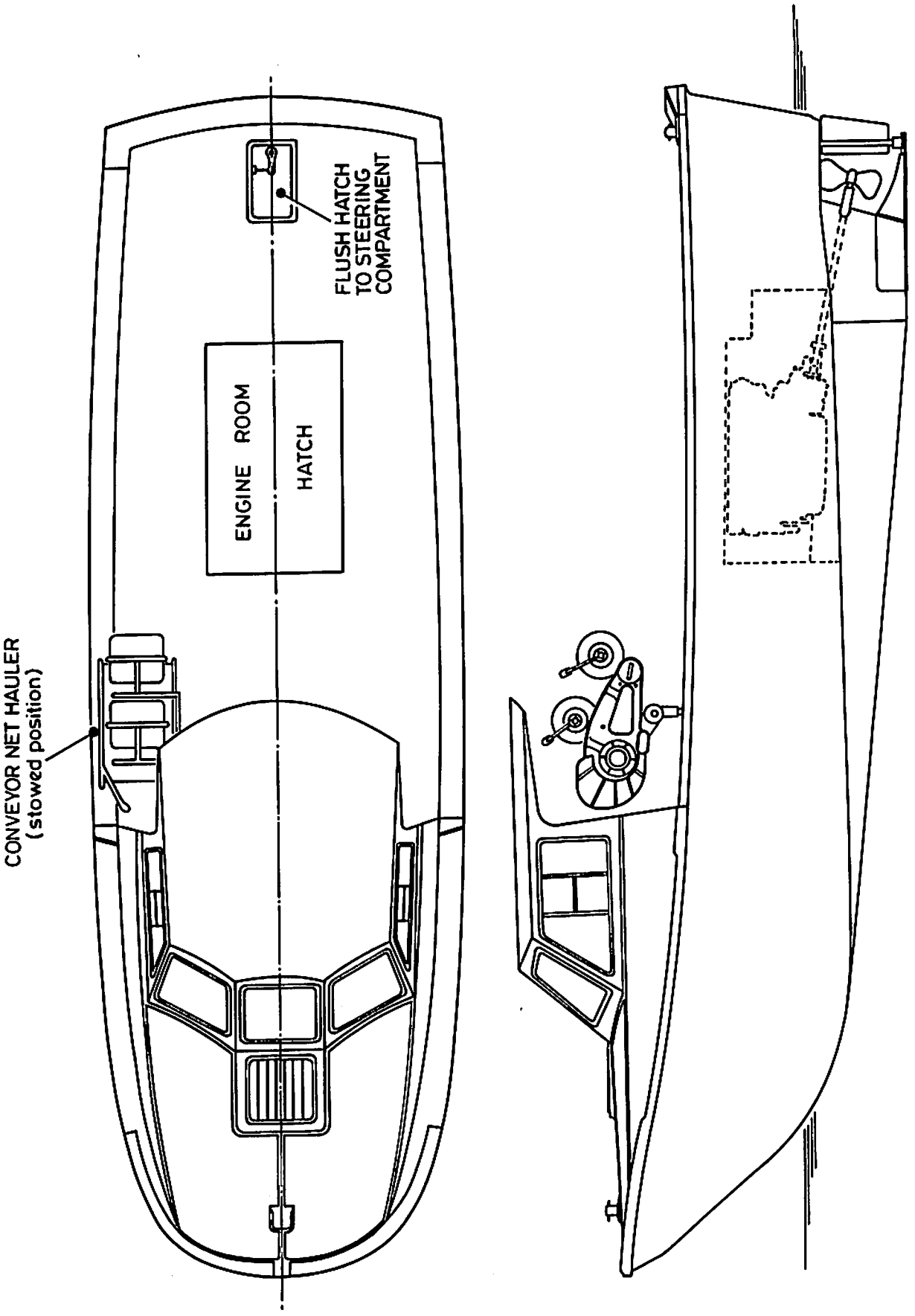


Shooting the Nets

Fig. 26

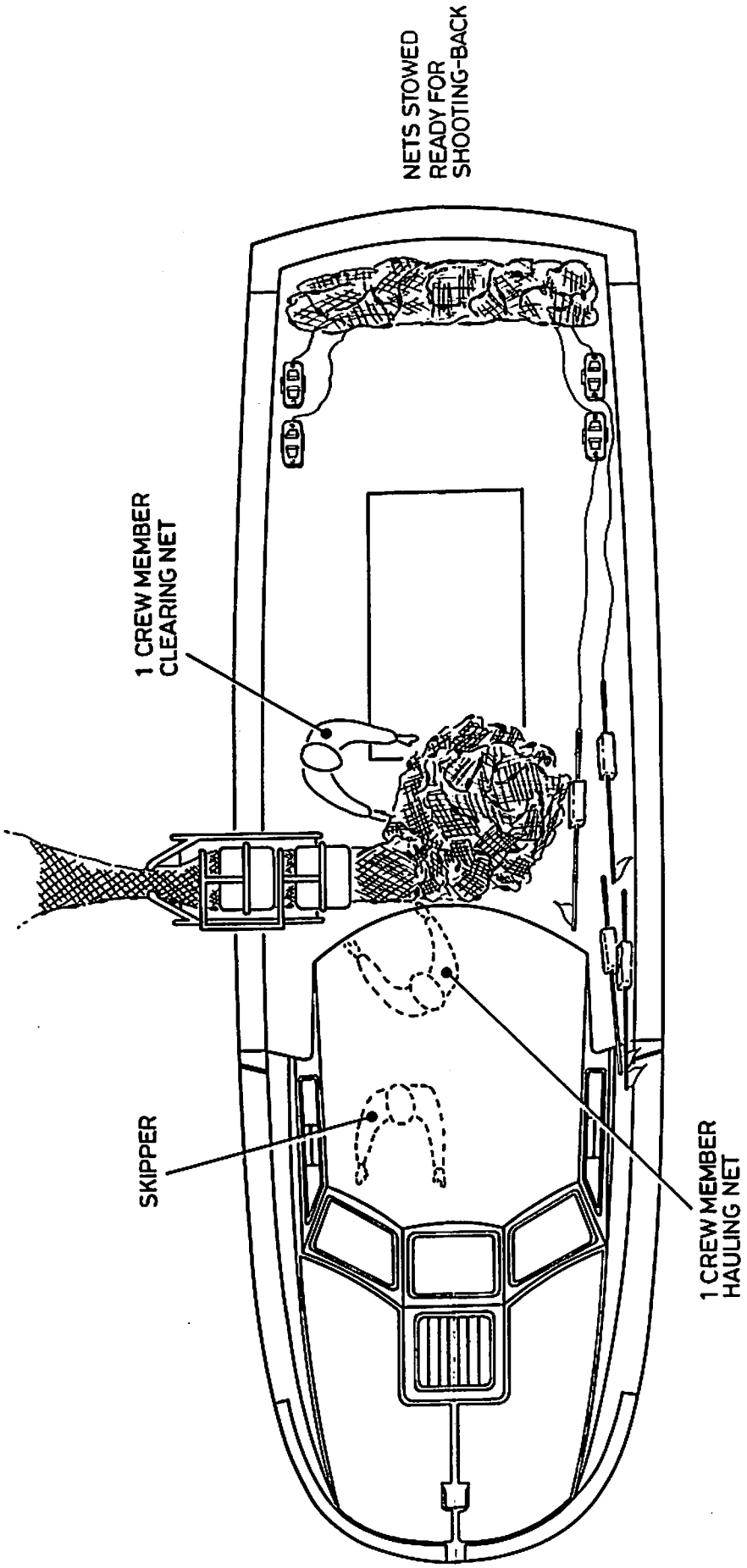
DIAGRAMS SHOWING VESSEL LAYOUT RELATING TO THE FISHING OPERATIONS

M.F.V. NIKKI-D



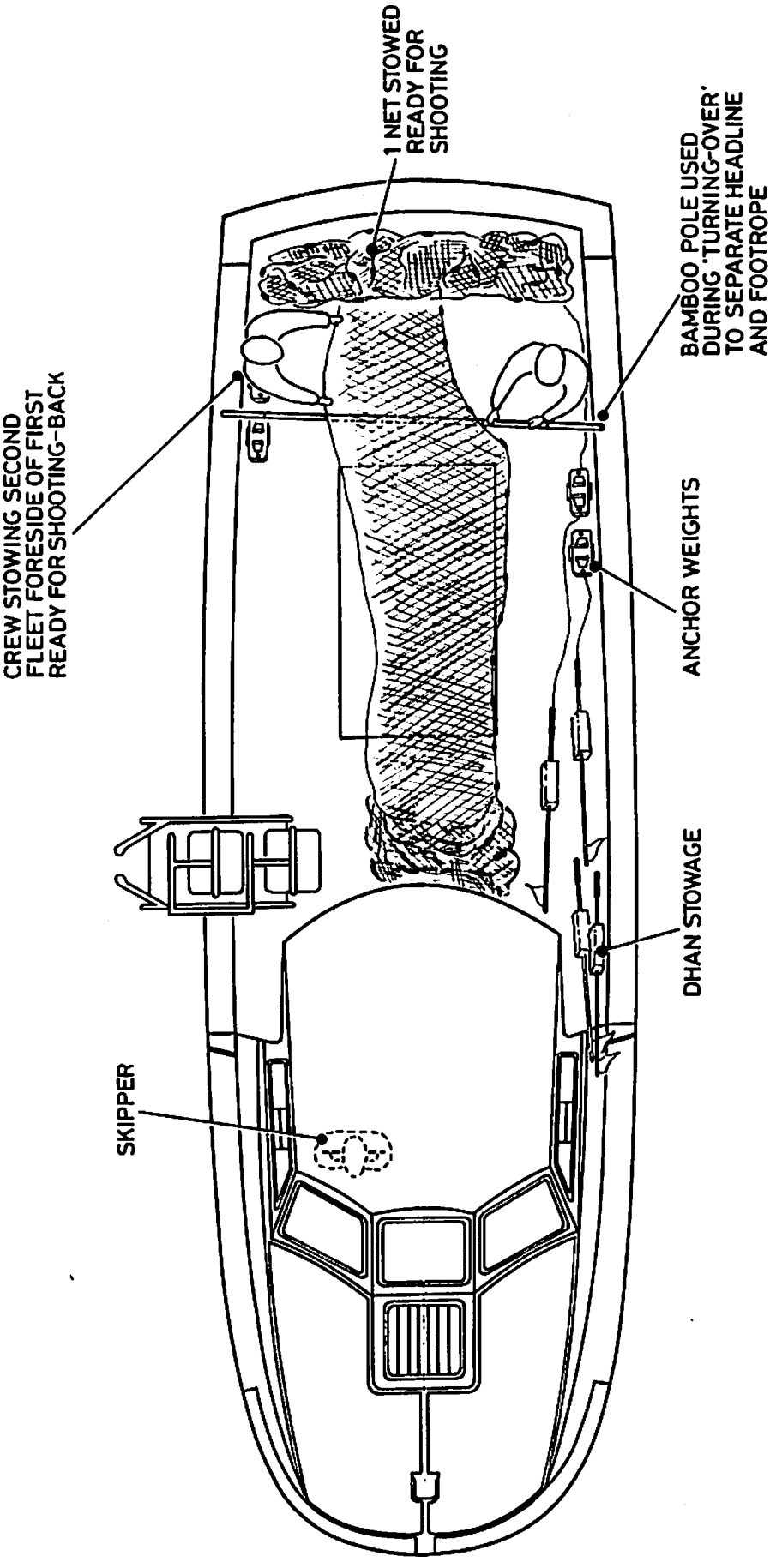
MFV 'Nikki - D' Deck Layout

Fig. 27.



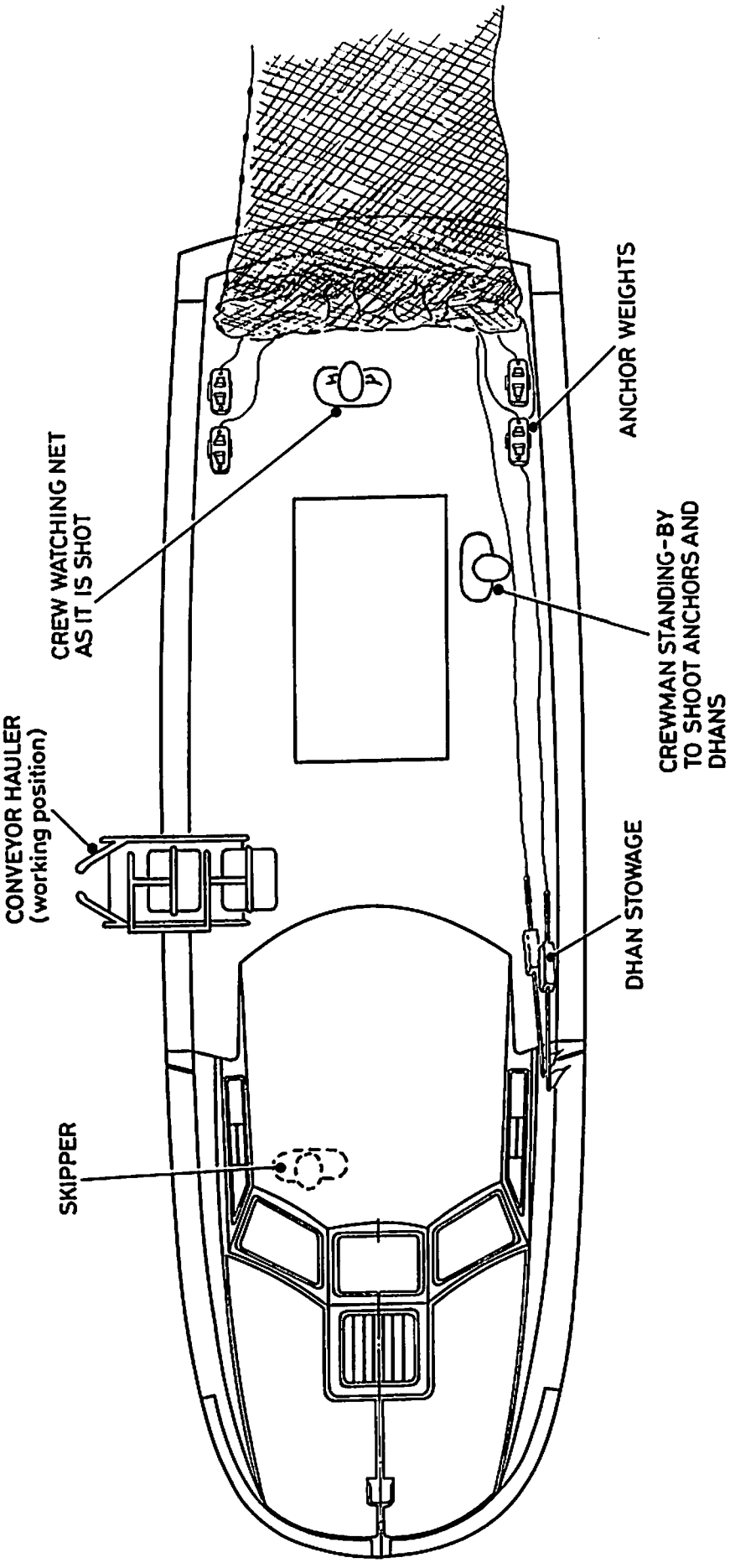
MFV 'Nikki-D' Hauling Operation

Fig. 28.



MFV 'Nikki-D'
Preparation of Nets for Shooting - 'Turning-Over' Operation

Fig. 29.



MFV 'Nikki-D' Shooting Operation

Fig 30.

DAILY LOG SHEETS (M.F.V. OUR WAY)

FOR TRIALS PERIOD 5/9/88 TO 9/9/88 INCLUSIVE

DATE 5TH SEPTEMBER 1988						
FLEET	A	B	C	D	E	F
POSITION	N. 5241, 2004 S. 5215, 1992	N. 5220, 19993 S. 5193, 1991	N. 5242, 1945 S. 5214, 1936	N. 5209, 1961 S. 5189, 1952	N. 5195, 1970 S. 5164, 1964	N. 5190, 1923 S. 5167, 1923
WEATHER	Force 3 to 4 Westerly					
SEASTATE	Calm	High Water 10:20		Low Water 16:20		
TIME SHOT	1810	1815	1835	1820	1825	1835
TIME HAULED						
FISHING TIME (APPROX.)	12+	12+	12+	12+	12+	12+
DEPTH(FATHOMS)	10	10	12	10	10	12
HAULING TIME	10 minutes	11 minutes	10 minutes	12 minutes	10 minutes	15 minutes
CLEARING	Easy	Relatively easy	Poor due to large numbers of jellyfish	Easy	Easy	Moderate due to jellyfish
GROUND TYPE	Mixed	Mixed	Mixed	Mixed	Mixed	Mixed
COMMENTS	23kg fish mostly mackerel	Lots of jelly-fish in net. 55kg mackerel 10kg flatfish	Jellyfish present in large quantities throughout net. 18kg fish mostly mackerel	Lots of jelly-fish in net, crabs (soft) around fish in net therefore damaged fish. 30kg fish 50% mackerel, 50% flatfish.	Few damaged flatfish present. 27kg fish mostly mackerel	Lots of jelly-fish in one end of net, crabs around fish in net. 8kg mixed fish

NOTE

All positions shown are for Latitude 54^{o}N, Longitude 01^{o}W. Figures shown in table represent minutes and decimals of one minute for both latitude and longitude.

N - Denotes the position of the North end of fleet.
S - Denotes the position of the South end of fleet.

e.g. N. 5241, 2004 represents - North end of fleet - latitude 54^{o} $52.41'$ N
longitude 01^{o} $20.04'$ W

DATE 6TH SEPTEMBER 1988

FLEET	A	B	C	D	E	F
POSITION	N. 5224, 2011 S. 5250, 2018	N. 5219, 1995 S. 5191, 1983	N. 5225, 1946 S. 5209, 1930	N. 5359, 2064 S. 5331, 2052	N. 5244, 2005 S. 5214, 2000	N. 5211, 1941 S. 5190, 1930
WEATHER	Force 2 to 3 Westerly					
SEASTATE	Calm	High Water 1235		Low Water 1835		
TIME SHOT						
TIME HAULED	1230	0930	1130	0745	0835	1150
FISHING TIME (APPROX.)	APPROXIMATELY 24 HOURS					
DEPTH(FATHOMS)	10	10	12	6	8	12
HAULING TIME	11 minutes	10 minutes	8 minutes (short net)	12 minutes	15 minutes	10 minutes
CLEARING	Easy	Very Easy	Slow due to presence of jellyfish	Easy	Moderate due to presence of crab	Fair
GROUND TYPE	Mixed - hard and soft sand	Hard	Hard	Hard	Mixed	Mixed
COMMENTS	Very few jellyfish 27kg fish mostly mackerel	Large quantities of jellyfish many falling out as net is hauled. 15kg fish mostly mackerel	Jellyfish causing problems throughout fleet. 12kg fish mostly mackerel	Jellyfish throughout net. 10kg mixed fish	Crabs in large concentrations in some regions of the net. Juvenile crabs mostly in post moult condition i.e. soft. Many crabs destroyed. 11kg mixed fish	Fewer crabs than previous fleet. Jellyfish still present. 20kg fish mostly mackerel

DATE 7TH SEPTEMBER 1988

FLEET	A	B	C	D	E	F
POSITION	N. 5439, 1528 S. 5414, 1522	N. 5448, 1544 S. 5418, 1532	N. 5464, 1553 S. 5449, 1554	N. 5294, 1897 S. 5263, 1898	N. 5296, 1881 S. 5268, 1864	N. 5446, 1541 S. 5464, 1544
WEATHER	Force 3 to 4 Southerly					
SEASTATE	Slight	High Water 1245		Low Water 1845		
TIME SHOT						
TIME HAULED	1200	1100	1135	0700	0825	1235
FISHING TIME (APPROX.)	2 4 H O U R S					
DEPTH(FATHOMS)	22	20	20	10	10	22
HAULING TIME	12 minutes	15 minutes	9 minutes	12 minutes	10 minutes	11 minutes
CLEARING	Easy	Easy (very few fish)	Easy	Easy	Moderate	Easy
GROUND TYPE	Hard/Mixed	Hard/Mixed	Hard/Mixed	Mixed/Hard	Softer ground mainly sand	Mixed
COMMENTS	Few jellyfish. No shellfish. Fishing further offside. Approx. 4kg fish mainly codlings.	Few jellyfish. Encountered on offside ground Approx. 5kg mixed fish.	Few fish and few shellfish. Approx. 6kg mixed fish.	Few jellyfish. 22kg mixed fish - cod and wrasse	Small, soft crabs. 10kg mixed fish	 9kg fish all codlings.

DATE 8TH SEPTEMBER 1988

FLEET	A	B	C	D	E	F
POSITION	N. 5229, 1845 S. 5210, 1857	N. 5278, 1908 S. 5252, 1892	N. 5272, 1822 S. 5265, 1822	N. 5230, 1899 S. 5201, 1885	N. 5301, 1850 S. 5274, 1838	N. 5247, 1891 S. 5274, 1881
WEATHER	Force 4 South Easterly					
SEASTATE	Slight to Moderate		High Water 1331		Low Water 1931	
TIME SHOT						
TIME HAULED	0925	1345	1135	0645	0805	1030
FISHING TIME (APPROX.)	2 4 H O U R S					
DEPTH(FATHOMS)	10	10	10	10	12	10
HAULING TIME	12 minutes	11 minutes	10 minutes	10 minutes	10 minutes	35 minutes
CLEARING	Easy	Easy	Easy	Easy	Easy	Poor due to jellyfish & crabs
GROUND TYPE	Mixed	Mixed	Mixed	Hard	Hard	Mixed/Hard
COMMENTS	Jellyfish abundant. No shellfish. Approx. 9kg mixed fish.	Many jellyfish. Approx. 31kg fish, mostly mackerel.	Few fish. 2kg mixed fish	Fewer jellyfish Approx. 14kg mixed fish.	Few jellyfish present. Approx. 10kg mixed fish.	Very large quantities of jellyfish throughout the net. Handling and clearing very difficult. Many crabs destroyed. 20kg fish

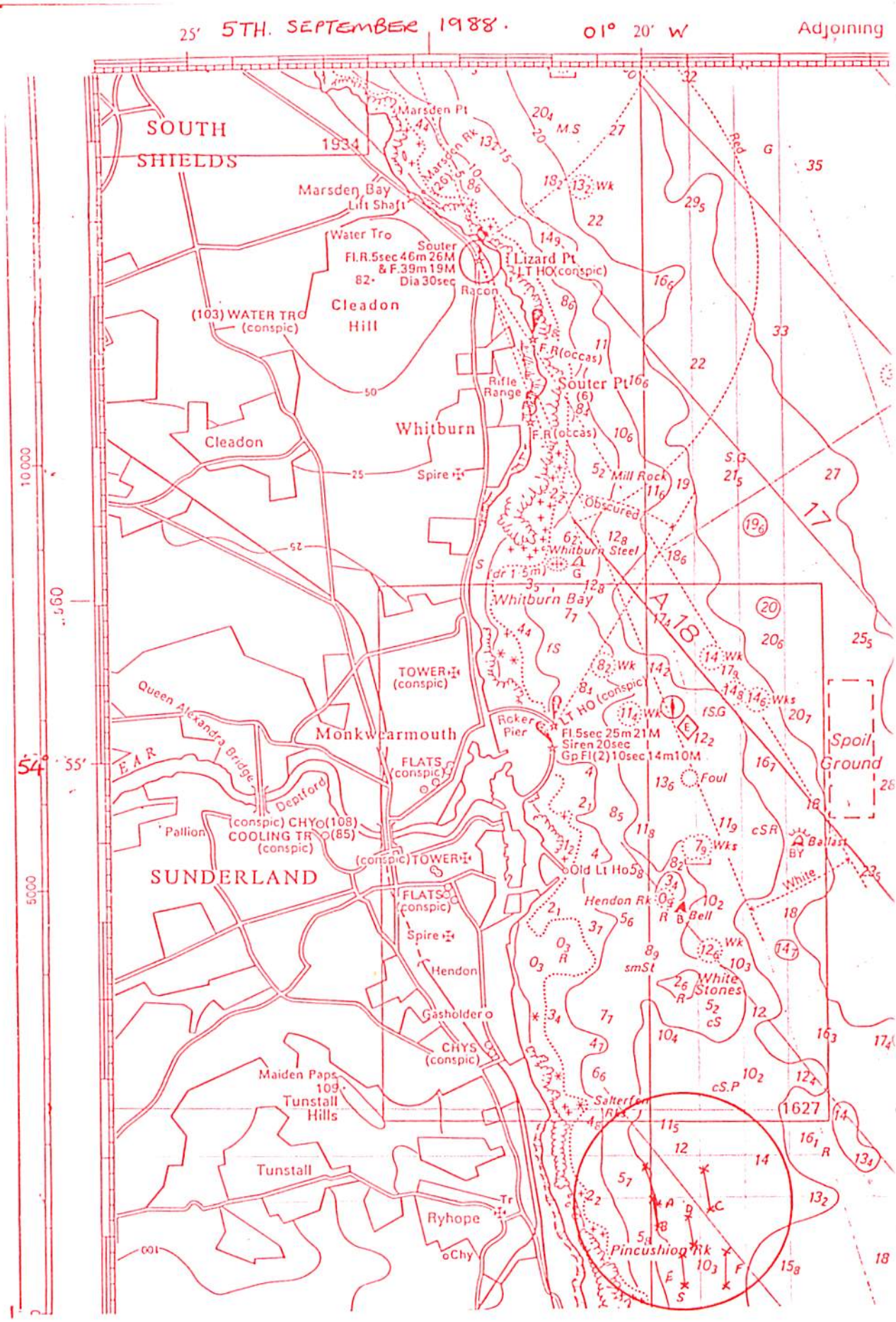
DATE 9TH SEPTEMBER 1988

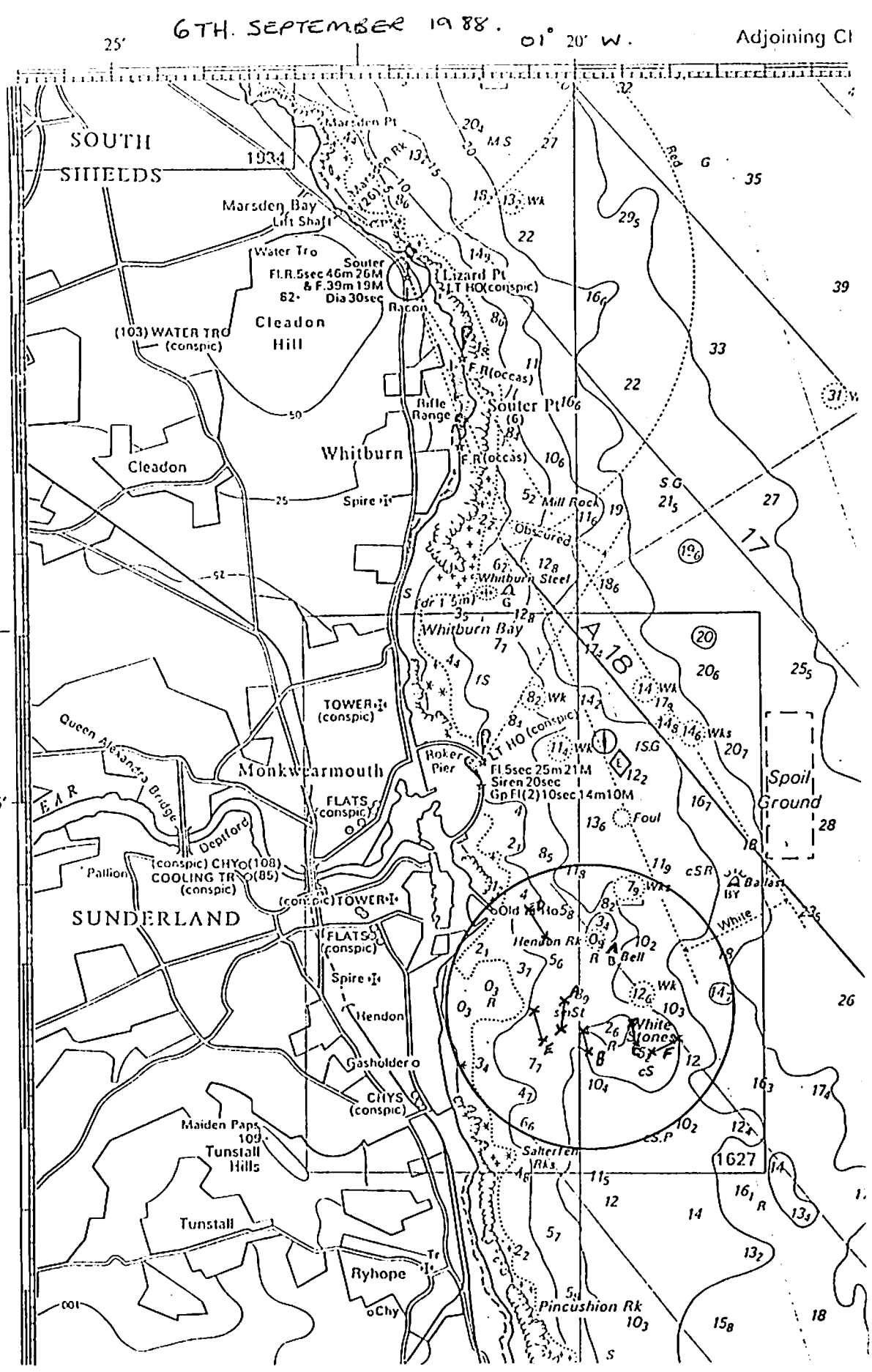
FLEET	A	B	C	D	E	F
POSITION	N. 5254, 1845 S. 5230, 1844	N. 5475, 2018 S. 5446, 2035	N. 5287, 1815 S. 5271, 1812	N. 5282, 1828 S. 5265, 1817	N. 5312, 1879 S. 5274, 1852	N. 5352, 1878 S. 5324, 1852
WEATHER	Force 3 to 4 West to South Westerly					
SEASTATE	Slight		High Water 1510		Low Water 2110	
TIME SHOT						
TIME HAULED	0942	1333	1027	1013	1052	1108
FISHING TIME (APPROX.)	2 4 H O U R S					
DEPTH(FATHOMS)	10	20	10	10	12	12
HAULING TIME	10 minutes	11 minutes	9 minutes	10 minutes	12 minutes	15 minutes
CLEARING	Easy	Easy	Easy	Easy (few fish)	Easy	Moderate
GROUND TYPE	Hard	Hard/Mixed	Hard	Hard	Hard	Hard
COMMENTS	No shellfish, Dhan and anchor parted more jellyfish than in vessels own gear. 5kg mixed fish	Some jellyfish present. Few codling present Approx. 12kg fish, mostly mackerel.	Few shellfish. Very few jelly fish. 4kg mixed fish	Approx. 4kg mixed fish.	Some shellfish present. Approx. 13kg mixed fish.	Numerous crabs present. Approx. 8kg fish (mixed).

CHART SECTIONS SHOWING AREAS OF OPERATION
FOR TRIALS PERIOD 5/9/88 TO 9/9/88 INCLUSIVE

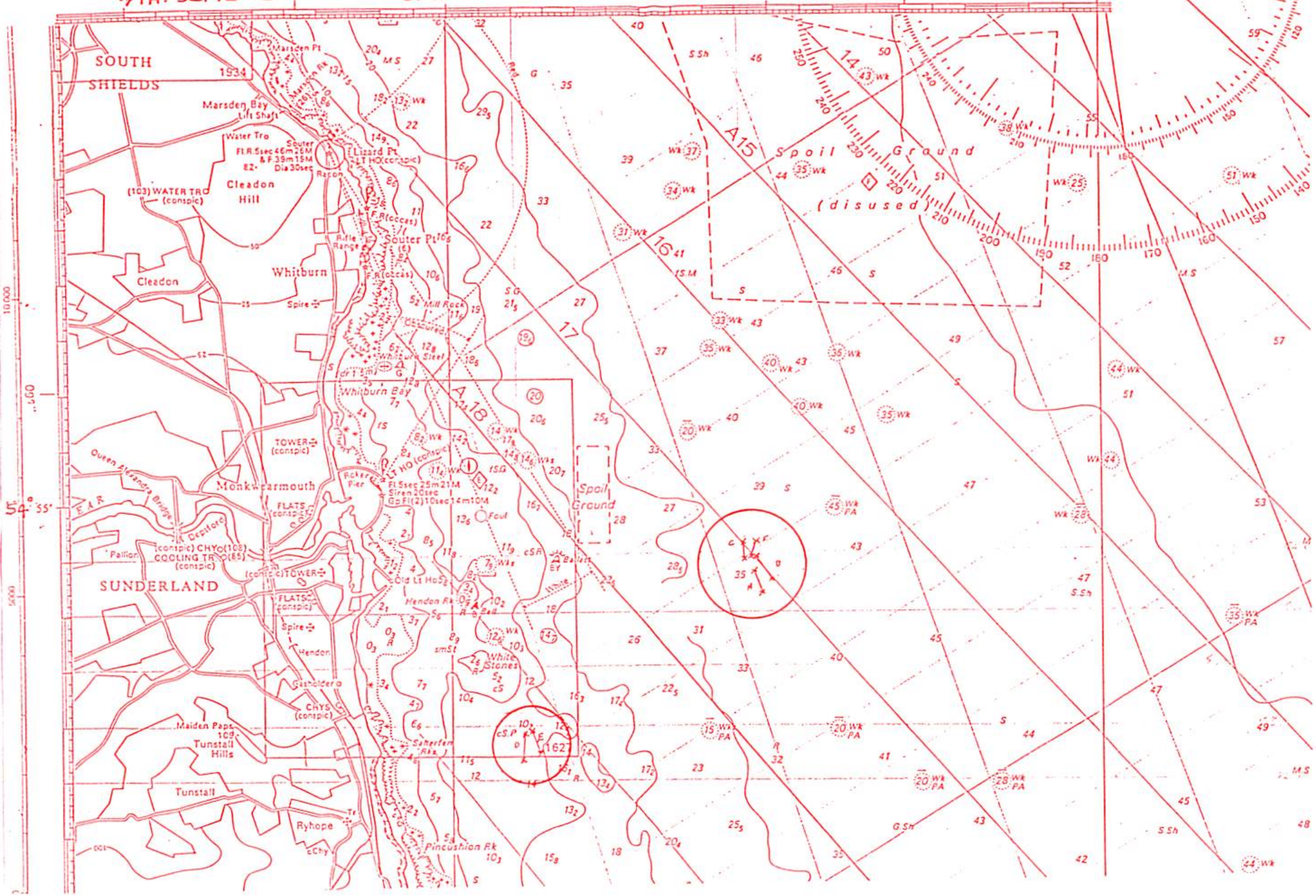
(Exact positions of fleets are given in the daily log sheets)

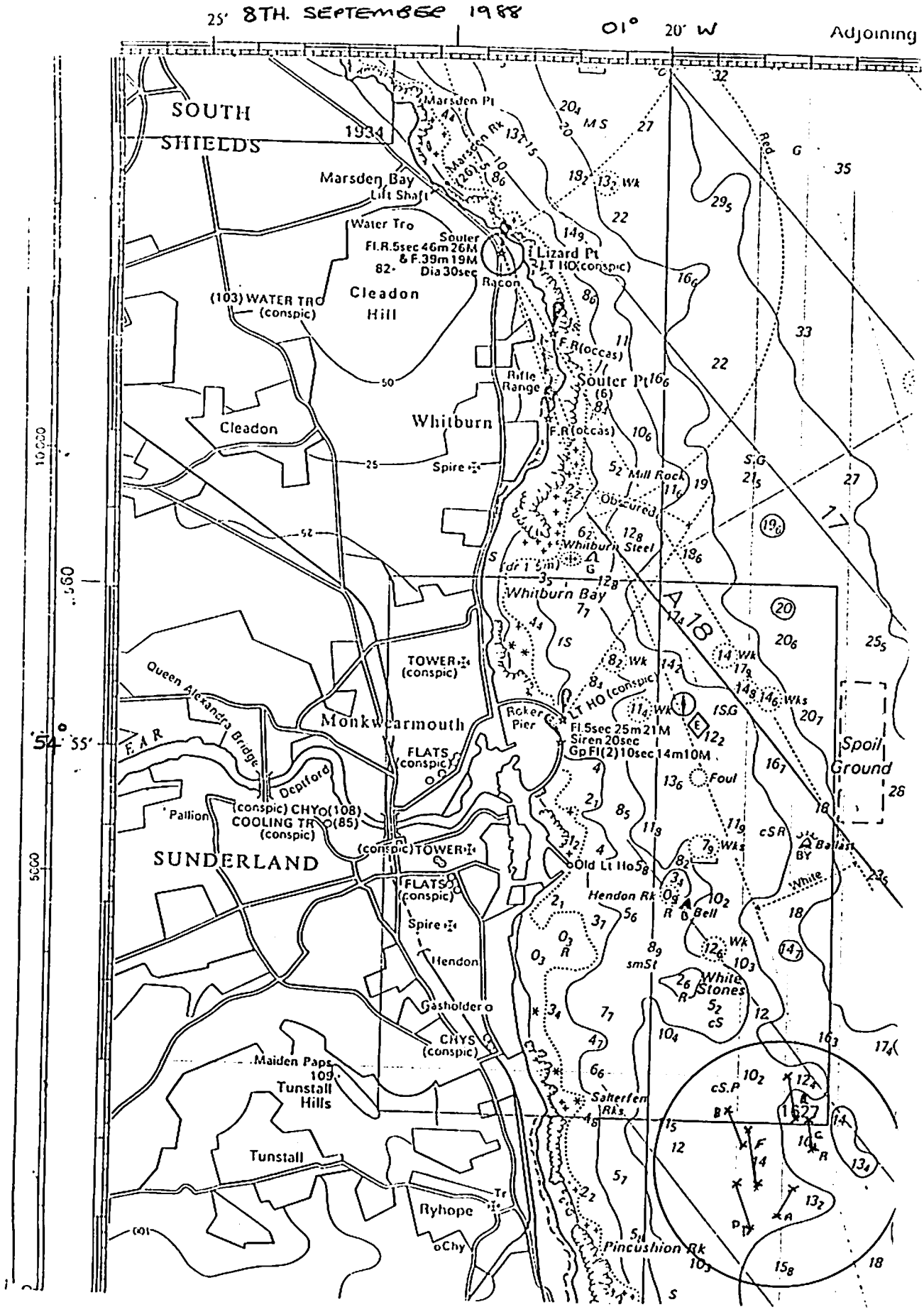
Extracted from Admiralty Chart No. L(D2)152
England - East Coast
River Tyne - River Tees


5TH. SEPTEMBER 1988.
25'
01° 20' W
Adjoining
SOUTH SHIELDS
1934
Marsden Pt
Marsden Rk
Marsden Bay
Lift Shaft
Water Tro
Souter
Fl.R.5sec 46m 26M
& F.39m 19M
Dia 30sec
Racon
Lizard Pt
LT HO(conspic)
(103) WATER TRO
(conspic)
Cleadon Hill
F.R(occas)
Souter Pt
(6)
Rifle Range
Cleadon
Whitburn
Spire
F.R(occas)
Mill Rock
Obscured
Whitburn Steel
dr 1.5m
Whitburn Bay
A 18
TOWER
(conspic)
Queen Alexandra Bridge
Monkwearmouth
Roker Pier
LT HO (conspic)
Fl.5sec 25m 21M
Siren 20sec
Gp Fl(2)10sec 14m10M
FLATS
(conspic)
Foul
Spoil Ground
Deptford
Pallion
(conspic) CHY (108)
COOLING TR (85)
(conspic)
SUNDERLAND
(conspic) TOWER
Old Lt Ho
Hendon Rk
Bell
White
FLATS
(conspic)
Spire
Hendon
smSt
White Stones
Gasholder
CHYS
(conspic)
Maiden Paps
109
Tunstall Hills
Tunstall
Ryhope
Chy
Salterfen Rks
1627
Pincushion Rk
54° 55'
10 000
5000
1

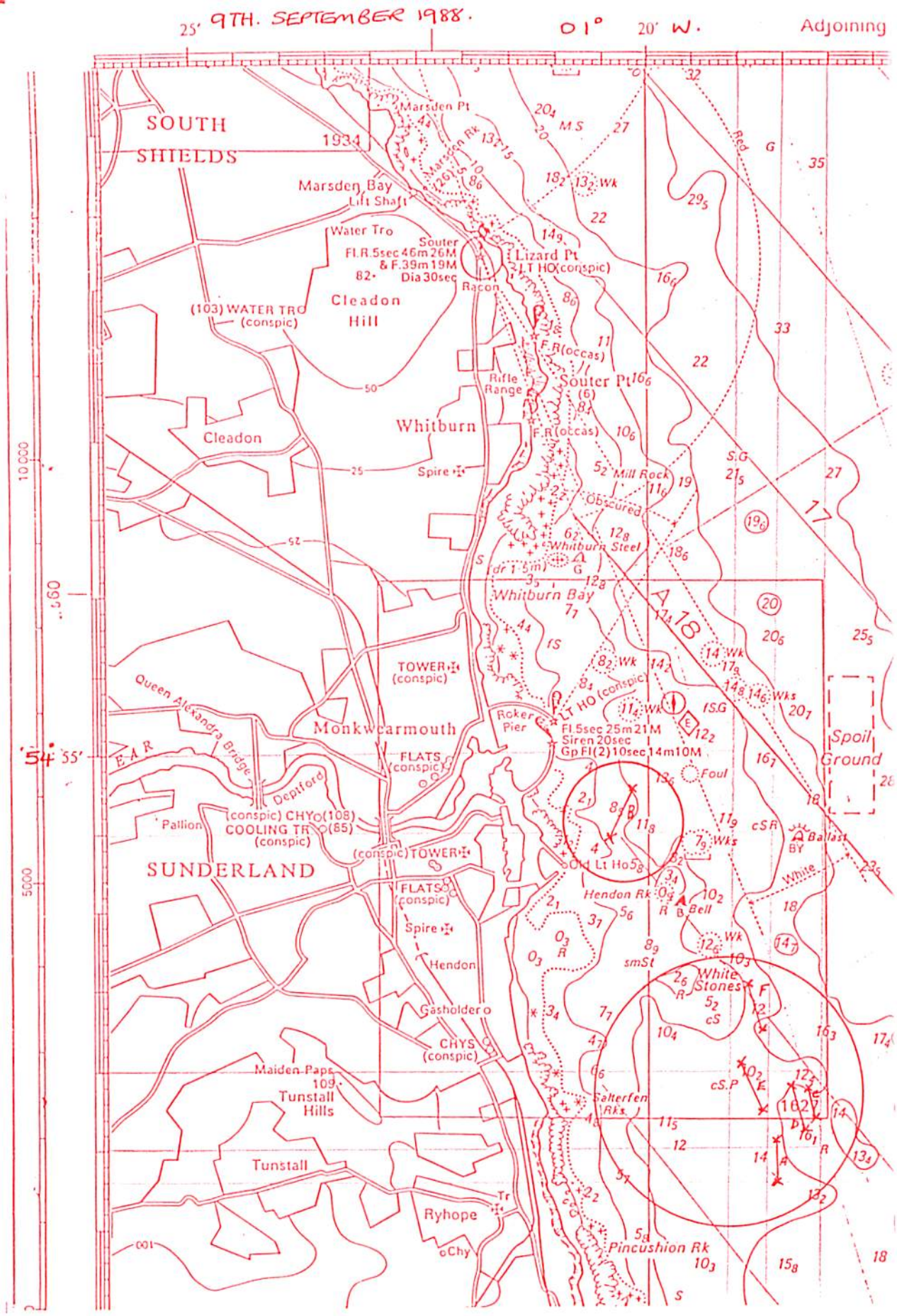

6TH. SEPTEMBER 1988.
01° 20' W.
Adjoining Cl
25'
SOUTH SHIELDS
1934
Marsden Pt
Marsden Bay
Lift Shaft
Water Tro
Souter
FLR.5sec 46m 26M
& F.39m 19M
62° Dia 30sec
Racon
Lizard Pt
LT HO(conspic)
Cleadon Hill
(103) WATER TRO (conspic)
F.R(occas)
Rifle Range
Souter Pt
(6)
Whitburn
Cleadon
Spire
Mill Rock
Obscured
Whitburn Steel
Whitburn Bay
A 18
TOWER (conspic)
Queen Alexandra Bridge
Monkwearmouth
Roker Pier
LT HO (conspic)
Fl.5sec 25m 21M
Siren 20sec
Gp Fl(2)10sec 14m10M
Spoil Ground
Foul
FLATS (conspic)
Deptford
Pallion
(conspic) CHY (108)
COOLING TR (85)
(conspic)
(conspic) TOWER
SUNDERLAND
Old Hetton Rk
Hendon Rk
Bell
White Stone
cS
cSP
cSR
Spire
Hendon
Gasholder
CHYS (conspic)
Maiden Paps
109
Tunstall Hills
Tunstall
Ryhope
Tr
oChy
Pincushion Rk
Salter Ten Rks
1627
4° 55'

7TH. SEPTEMBER 1988.




8TH. SEPTEMBER 1988
01° 20' W
Adjoining
SOUTH SHIELDS
1934
Marsden Pt
Marsden Bay
Lift Shaft
Water Tro
Souter
Fl.R.5sec 46m 26M
& F.39m 19M
Dia 30sec
Racon
Lizard Pt
LT HO (conspic)
(103) WATER TRO (conspic)
Cleadon Hill
F.R (occas)
Souter Pt
(6)
Rifle Range
Cleadon
Whitburn
Spire
F.R (occas)
Mill Rock
Obscured
Whitburn Steel
Whitburn Bay
A 18
TOWER (conspic)
Queen Alexandra Bridge
Monkwearmouth
Roker Pier
LT HO (conspic)
Fl.5sec 25m 21M
Siren 20sec
Gp Fl(2)10sec 14m10M
F.A.R
FLATS (conspic)
Spoil Ground
Foul
Deptford
Pallion
(conspic) CHY (108)
COOLING TR (85)
(conspic)
(conspic) TOWER
SUNDERLAND
Old Lt Ho
Hendon Rk
Bell
White
FLATS (conspic)
Spire
Hendon
smSt
White Stones
Gasholder
CHYS (conspic)
Maiden Paps
109
Tunstall Hills
Tunstall
Ryhope
oChy
Pincushion Rk
54° 55'
10 000
5000

9TH. SEPTEMBER 1988.



TABLES SHOWING TOTAL NUMBERS OF FISH CAUGHT FOR EACH DAY OF TRIALS

Including breakdown into three areas of capture,
i.e. upper, middle and lower thirds of net.

Data are for three experimental fleets A, B & C
and for three control fleets D, E & F.

FLEET A

DATE	5/9/88	6/9/88	7/9/88	8/9/88	9/9/88	TOTALS
CATCH POSITION IN NET UPPER, MIDDLE OR LOWER THIRD						
UPPER	7 (7)	7 (7)	1	4 (4)	4 (4)	23
MIDDLE	22 (19)	43 (41)	3	13 (7)	6 (5)	87
LOWER	12 (12)	17 (14)	2	4 (1)	4 (3)	39
TOTAL	41 (38)	67 (62)	6	21 (12)	14 (12)	149 (124)

(NUMBERS IN BRACKETS SHOW NUMBERS OF MACKEREL)

FLEET B

DATE	5/9/88	6/9/88	7/9/88	8/9/88	9/9/88	TOTALS
CATCH POSITION IN NET UPPER, MIDDLE OR LOWER THIRD						
UPPER	30 (30)	6 (5)	1	14 (13)	10 (3)	61 (51)
MIDDLE	38 (32)	24 (22)	2	44 (39)	17 (4)	125 (97)
LOWER	4 (4)	6 (3)	10 (2)	32 (29)	12 (9)	64 (47)
TOTAL	72 (66)	36 (30)	13 (2)	90 (81)	39 (16)	250 (195)

(NUMBERS IN BRACKETS SHOW NUMBERS OF MACKEREL)

FLEET C

DATE	5/9/88	6/9/88	7/9/88	8/9/88	9/9/88	TOTALS
CATCH POSITION IN NET UPPER, MIDDLE OR LOWER THIRD						
UPPER	8 (7)	9 (7)	–	–	1 (1)	18 (15)
MIDDLE	7 (7)	16 (15)	2	3 (2)	6 (3)	34 (27)
LOWER	10 (8)	6 (4)	6	3 (2)	5 (3)	30 (17)
TOTAL	25 (22)	31 (26)	8	6 (4)	12 (7)	82 (59)

(NUMBERS IN BRACKETS SHOW NUMBERS OF MACKEREL)

FLEET D

DATE	5/9/88	6/9/88	7/9/88	8/9/88	9/9/88	TOTALS
CATCH POSITION IN NET UPPER, MIDDLE OR LOWER THIRD						
UPPER	8 (7)	13 (11)	3	-	2 (2)	26 (20)
MIDDLE	14 (8)	6 (5)	12 (1)	12 (1)	4 (2)	48 (17)
LOWER	13 (3)	7	3	2	2 (1)	27 (4)
TOTAL	35 (18)	26 (16)	18 (1)	14 (1)	8 (5)	101 (41)

(NUMBERS IN BRACKETS SHOW NUMBERS OF MACKEREL)

FLEET E

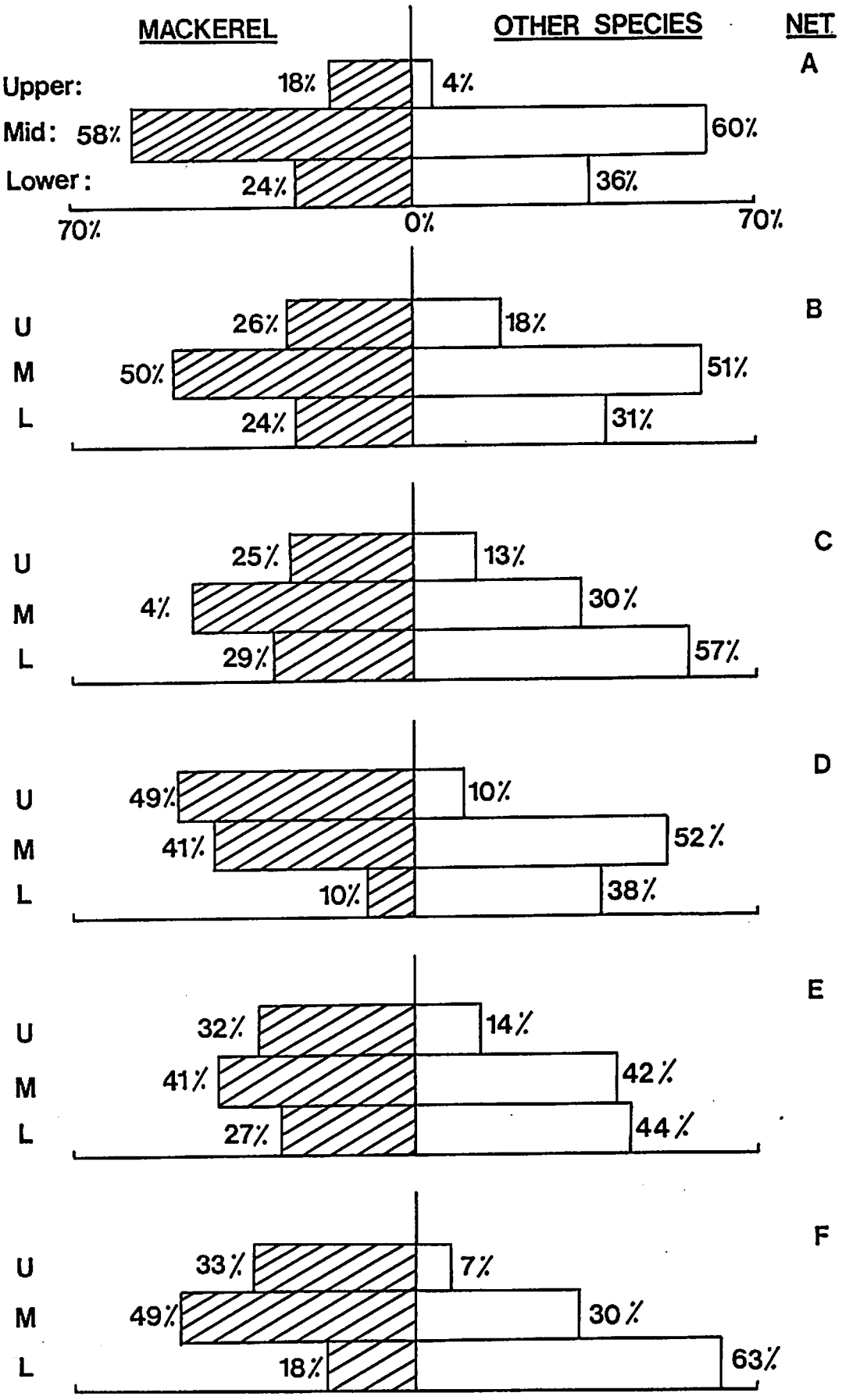
DATE	5/9/88	6/9/88	7/9/88	8/9/88	9/9/88	TOTALS
CATCH POSITION IN NET UPPER, MIDDLE OR LOWER THIRD						
UPPER	14 (14)	-	9 (2)	1 (1)	5 (2)	29 (19)
MIDDLE	23 (19)	14 (4)	5	5	7 (1)	54 (24)
LOWER	17 (10)	12 (3)	5	7	7 (3)	48 (16)
TOTAL	54 (43)	26 (7)	19 (2)	13 (1)	19 (6)	131 (59)

(NUMBERS IN BRACKETS SHOW NUMBERS OF MACKEREL)

FLEET F

DATE	5/9/88	6/9/88	7/9/88	8/9/88	9/9/88	TOTALS
CATCH POSITION IN NET UPPER, MIDDLE OR LOWER THIRD						
UPPER	8 (6)	12 (11)	-	8 (7)	2 (2)	30 (26)
MIDDLE	6 (2)	25 (23)	3	16 (13)	5	55 (38)
LOWER	4 (1)	15 (5)	6	17 (7)	7 (1)	49 (14)
TOTAL	18 (9)	52 (39)	9	41 (27)	14 (9)	134 (78)

(NUMBERS IN BRACKETS SHOW NUMBERS OF MACKEREL)



PERCENTAGE OF TOTAL CATCH TAKEN OVER 5 DAY TRIAL PERIOD TAKEN IN EACH OF 3 REGIONS OF THE NET.

TABLES SHOWING NUMBERS AND SPECIES OF FISH CAUGHT FROM BOTH EXPERIMENTAL AND CONTROL NETS FOR EACH DAY OF TRIALS

DATE 5TH SEPTEMBER 1988								
NET EXPERIMENTAL		**A1**	**A2**	**A3**	**A4**	**A5**	**A6**	**FLEET TOTAL NOS. OF FISH**
CATCH POSITION IN NET UPPER, MIDDLE OR LOWER THIRD								
UPPER		3 MAC	2 MAC	1 MAC	-	-	1 MAC	7
MIDDLE		7 MAC	8 MAC 1 WHIT	3 MAC	1 MAC 1 WHIT	1 FLAT	-	22
LOWER		5 MAC	1 MAC	1 MAC	2 MAC	1 MAC	1 MAC	12
NET TOTAL (NOS. OF FISH)		15	12	5	4	2	3	41
SHELLFISH								
EDIBLE CRAB	**M**	1						1
	F	2						2
LOBSTERS	**M**	-	-	-	-	-	-	-
	F	-	-	-	-	-	-	-

MAC - MACKEREL
WHIT - WHITING
FLAT - FLAT FISH (PLAICE, FLOUNDER, DAB)

DATE 5TH SEPTEMBER 1988								
NET EXPERIMENTAL		B1	B2	B3	B4	B5	B6	FLEET TOTAL NOS. OF FISH
CATCH POSITION IN NET UPPER, MIDDLE OR LOWER THIRD								
UPPER		7 MAC	8 MAC	5 MAC	3 MAC	2 MAC	5 MAC	30
MIDDLE		7 MAC 1 POUT	10 MAC 3 WHIT	2 MAC 1 SEA TROUT	6 MAC	4 MAC 1 WHIT	3 MAC	38
LOWER		1 MAC	1 MAC	-	-	1 MAC	1 MAC	4
NET TOTAL (NOS. OF FISH)		16	22	8	9	8	9	72
SHELLFISH								
EDIBLE CRAB	M	-	-	-	-	-	-	-
	F	-	-	-	-	-	-	-
LOBSTERS	M	-	-	-	-	-	-	-
	F	-	-	-	-	1	-	1

DATE 5TH SEPTEMBER 1988								
NET EXPERIMENTAL		C1	C2	C3	C4			FLEET TOTAL NOS. OF FISH
CATCH POSITION IN NET UPPER, MIDDLE OR LOWER THIRD								
UPPER		4 MAC	1 MAC	1 MAC	1 MAC 1 WHIT			8
MIDDLE		3 MAC	1 MAC	2 MAC	1 MAC			7
LOWER		2 MAC	2 MAC 1 FLAT	3 MAC 1 WHIT	1 MAC			10
NET TOTAL (NOS. OF FISH)		9	5	7	4			25
SHELLFISH								
EDIBLE CRAB	M	-	-	-	-			-
	F	-	-	-	-			-
LOBSTERS	M	-	-	-	-			-
	F	-	-	-	-			-

DATE 5TH SEPTEMBER 1988

NET CONTROLS		FLEET D	FLEET E	FLEET F				FLEET TOTAL NOS. OF FISH
CATCH POSITION IN NET UPPER, MIDDLE OR LOWER THIRD								
UPPER		7 MAC 1 WHIT	14 MAC	6 MAC 1 POUT 1 FLAT				30
MIDDLE		8 MAC 3 WHIT 3 FLAT	19 MAC 1 COD 3 WHIT	2 MAC 4 FLAT				43
LOWER		3 MAC 10 FLAT	10 MAC 1 COD 1 WHIT 1 POUT 4 FLAT	1 MAC 3 FLAT				34
NET TOTAL (NOS. OF FISH)		35	54	18				107
SHELLFISH								
EDIBLE CRAB	M	16	11	10				37
	F	23	11	9				43
LOBSTERS	M	4	-	1				5
	F	3	-	6				9

DATE 6TH SEPTEMBER 1988								
NET EXPERIMENTAL		A1	A2	A3	A4	A5	A6	FLEET TOTAL NOS. OF FISH
CATCH POSITION IN NET UPPER, MIDDLE OR LOWER THIRD								
UPPER		2 MAC	2 MAC	-	2 MAC	1 MAC	-	7
MIDDLE		3 MAC 1 WHIT	-	1 MAC	9 MAC	9 MAC	9 MAC 1 WHIT	33
LOWER		1 MAC 1 COD	-	2 MAC 1 WHIT	3 MAC 1 WHIT	5 MAC	3 MAC	17
NET TOTAL (NOS. OF FISH)		8	2	4	15	15	13	57
SHELLFISH								
EDIBLE CRAB	M	-	-	-	-	-	-	-
	F	-	-	-	-	-	-	-
LOBSTERS	M	-	-	-	-	-	-	-
	F	-	-	-	-	-	-	-

DATE 6TH SEPTEMBER 1988

NET EXPERIMENTAL		B1	B2	B3	B4	B5	B6	FLEET TOTAL NOS. OF FISH
CATCH POSITION IN NET UPPER, MIDDLE OR LOWER THIRD								
UPPER		-	-	1 WHIT	1 MAC	1 MAC	3 MAC	6
MIDDLE		-	5 MAC 1 GURNARD	5 MAC	1 MAC 1 WHIT	4 MAC	8 MAC	24
LOWER		1 POUT	-	2 MAC 1 FLAT	-	1 COD	1 MAC	6
NET TOTAL (NOS. OF FISH)		1	6	9	3	6	12	36
SHELLFISH								
EDIBLE CRAB	M	-	-	-	-	-	-	-
	F	-	-	-	-	-	-	-
LOBSTERS	M	-	-	-	-	-	-	-
	F	-	-	-	-	-	-	-

DATE 6TH SEPTEMBER 1988								
NET EXPERIMENTAL		C1	C2	C3	C4			FLEET TOTAL NOS. OF FISH
CATCH POSITION IN NET UPPER, MIDDLE OR LOWER THIRD								
UPPER		3 MAC	2 MAC	2 WHIT	2 MAC			9
MIDDLE		5 MAC 1 WHIT	4 MAC	2 MAC	4 MAC			16
LOWER		1 FLAT	2 MAC	1 MAC 1 WHIT	1 MAC			6
NET TOTAL (NOS. OF FISH)		10	8	6	7			31
SHELLFISH								
EDIBLE CRAB	M	-	4	-	-			4
	F	-	1	-	-			1
LOBSTERS	M	-	-	-	-			-
	F	-	-	-	-			-

DATE 6TH SEPTEMBER 1988								
NET CONTROL		FLEET D	FLEET E	FLEET F				FLEET TOTAL NOS. OF FISH
CATCH POSITION IN NET UPPER, MIDDLE OR LOWER THIRD								
UPPER		11 MAC 1 COD 1 FLAT	-	11 MAC 1 WHIT				25
MIDDLE		5 MAC 1 FLAT	4 MAC 9 FLAT 1 COD	23 MAC 2 WHIT				45
LOWER		7 FLAT	3 MAC 9 FLAT	5 MAC 9 FLAT 1 COD				34
NET TOTAL (NOS. OF FISH)		26	26	52				104
SHELLFISH								
EDIBLE CRAB	M	1	18	2				21
	F	3	16	1				20
LOBSTERS	M	2	3	-				5
	F	1	7	1				9

DATE 7TH SEPTEMBER 1988								
NET EXPERIMENTAL		A1	A2	A3	A4	A5	A6	FLEET TOTAL NOS. OF FISH
CATCH POSITION IN NET UPPER, MIDDLE OR LOWER THIRD								
UPPER		-	1 WHIT	-	-	-	-	1
MIDDLE		-	-	1 COD	1 COD	1 COD	-	3
LOWER		-	-	-	-	-	2 COD	2
NET TOTAL (NOS. OF FISH)			1	1	1	1	2	6
SHELLFISH								
EDIBLE CRAB	M	-	-	-	-	-	-	-
	F	-	-	-	-	-	-	-
LOBSTERS	M	-	-	-	-	-	-	-
	F	-	-	-	-	-	-	-

DATE 7TH SEPTEMBER 1988								
NET EXPERIMENTAL		B1	B2	B3	B4	B5	B6	FLEET TOTAL NOS. OF FISH
CATCH POSITION IN NET UPPER, MIDDLE OR LOWER THIRD								
UPPER		-	-	-	-	1 COD	-	1
MIDDLE		2 WHIT	-	-	-	-	-	2
LOWER		2 MAC	1 COD	1 WHIT 1 FLAT	2 COD	2 COD 1 LING	-	10
NET TOTAL (NOS. OF FISH)		4	1	2	2	4	-	13
SHELLFISH								
EDIBLE CRAB	M	-	-	-	-	-	-	-
	F	-	-	-	-	-	-	-
LOBSTERS	M	-	-	-	-	-	-	-
	F	-	-	-	-	-	-	-

DATE 7TH SEPTEMBER 1988								
NET EXPERIMENTAL		C1	C2	C3	C4			FLEET TOTAL NOS. OF FISH
CATCH POSITION IN NET UPPER, MIDDLE OR LOWER THIRD								
UPPER		-	-	-	-			-
MIDDLE		-	1 WHIT	1 COD	-			2
LOWER		1 COD 1 WHIT	1 WHIT	3 COD	-			6
NET TOTAL (NOS. OF FISH)		2	2	4	-			8
SHELLFISH								
EDIBLE CRAB	M	1	-	1	-			2
	F	-	2	-	-			2
LOBSTERS	M	-	1	-	-			1
	F	-	-	-	-			-

DATE 7TH SEPTEMBER 1988

NET CONTROL		FLEET D	FLEET E	FLEET F				FLEET TOTAL NOS. OF FISH
CATCH POSITION IN NET UPPER, MIDDLE OR LOWER THIRD								
UPPER		1 COD 1 WRASSE 1 FLAT	2 MAC 5 POUT 1 COLEY 1 MONK	-				12
MIDDLE		1 MAC 5 WRASSE 1 MONK 2 POUT 3 COD	3 COD 2 POUT	3 COD				20
LOWER		1 CATFISH 1 WRASSE 1 POLLOCK	3 POUT 2 FLAT	6 COD				14
NET TOTAL (NOS. OF FISH)		18	19	9				46
SHELLFISH								
EDIBLE CRAB	M	1	1	2				4
	F	3	3	3				9
LOBSTERS	M	5	1	-				6
	F	3	2	-				5

DATE 8TH SEPTEMBER 1988								
NET EXPERIMENTAL		A1	A2	A3	A4	A5	A6	FLEET TOTAL NOS. OF FISH
CATCH POSITION IN NET UPPER, MIDDLE OR LOWER THIRD								
UPPER		-	-	-	1 MAC	3 MAC	-	4
MIDDLE		-	1 COLEY 2 MAC 1 WHIT	1 MAC	1 MAC	3 MAC 1 WHIT	3 COLEY	13
LOWER		-	-	1 POUT	-	-	2 COD 1 MAC	4
NET TOTAL (NOS. OF FISH)		-	4	2	2	7	6	21
SHELLFISH								
EDIBLE CRAB	M	-	-	-	-	-	-	-
	F	-	-	-	-	-	-	-
LOBSTERS	M	-	-	-	-	-	-	-
	F	-	-	-	-	-	-	-

DATE 8TH SEPTEMBER 1988

NET EXPERIMENTAL		B1	B2	B3	B4	B5	B6	FLEET TOTAL NOS. OF FISH
CATCH POSITION IN NET UPPER, MIDDLE OR LOWER THIRD								
UPPER		1 MAC 1 COLEY	1 MAC	3 MAC	3 MAC	3 MAC	2 MAC	14
MIDDLE		7 MAC	7 MAC	9 MAC	5 MAC	8 MAC 1 WHIT	3 MAC 2 WHIT	44
LOWER		4 MAC 1 WHIT 1 FLAT	3 MAC	8 MAC	6 MAC	3 MAC 2 FLAT	4 MAC	32
NET TOTAL (NOS. OF FISH)		15	11	20	16	17	11	90
SHELLFISH								
EDIBLE CRAB	M	-	-	-	-	-	-	-
	F	-	-	-	-	-	-	-
LOBSTERS	M	-	-	-	-	-	-	-
	F	-	-	-	-	-	-	-

DATE 8TH SEPTEMBER 1988								
NET EXPERIMENTAL		C1	C2	C3	C4			FLEET TOTAL NOS. OF FISH
CATCH POSITION IN NET UPPER, MIDDLE OR LOWER THIRD								
UPPER		-	-	-	-			-
MIDDLE		-	1 MAC	1 POUT	1 MAC			3
LOWER		-	2 MAC 1 COD	-	-			3
NET TOTAL (NOS. OF FISH)		-	4	1	1			6
SHELLFISH								
EDIBLE CRAB	M	-	-	-	-			-
	F	-	-	-	-			-
LOBSTERS	M	-	-	-	-			-
	F	-	-	-	-			-

DATE 8TH SEPTEMBER 1988

NET CONTROL		FLEET D	FLEET E	FLEET F				FLEET TOTAL NOS. OF FISH
CATCH POSITION IN NET UPPER, MIDDLE OR LOWER THIRD								
UPPER		-	1 MAC	7 MAC 1 COD				9
MIDDLE		2 FLAT 1 MAC 2 COLEY 3 COD 1 LING 2 WRASSE 1 MONK	4 COD 1 DOGFISH	13 MAC 3 WHIT				33
LOWER		2 COD	5 COD 1 WRASSE 1 POUT	7 MAC 10 FLAT				26
NET TOTAL (NOS. OF FISH)		14	13	41				68
SHELLFISH								
EDIBLE CRAB	M	2	2	Numerous small crabs				4
	F	4	4	Destroyed for ease of clearing				8
LOBSTERS	M	3	2					5
	F	3	1					4

DATE 9TH SEPTEMBER 1988								
NET EXPERIMENTAL		A1	A2	A3	A4	A5	A6	FLEET TOTAL NOS. OF FISH
CATCH POSITION IN NET UPPER, MIDDLE OR LOWER THIRD								
UPPER		-	1 MAC	-	2 MAC	1 MAC	-	4
MIDDLE		-	1 MAC	-	1 MAC 1 COD	3 MAC	-	6
LOWER		-	-	1 FLAT	2 MAC	1 MAC	-	4
NET TOTAL (NOS. OF FISH)								14
SHELLFISH								
EDIBLE CRAB	M	-	-	-	-	-	-	-
	F	-	-	-	-	-	-	-
LOBSTERS	M	-	-	-	-	-	-	-
	F	-	-	-	-	-	-	-

DATE 9TH SEPTEMBER 1988

NET EXPERIMENTAL		B1	B2	B3	B4	B5	B6	FLEET TOTAL NOS. OF FISH
CATCH POSITION IN NET UPPER, MIDDLE OR LOWER THIRD								
UPPER		1 WHIT	-	-	1 MAC 3 WHIT	3 WHIT	2 MAC	10
MIDDLE		1 MAC	1 MAC 2 WHIT	1 WHIT 1 MAC	1 MAC 1 COD 1 WHIT	3 WHIT	5 WHIT	17
LOWER		2 MAC	-	-	-	5 MAC	2 MAC 1 HERRING 1 COD 1 WHIT	12
NET TOTAL (NOS. OF FISH)		4	3	2	7	11	12	39
SHELLFISH								
EDIBLE CRAB	M	-	-	-	-	-	-	-
	F	-	-	-	-	-	-	-
LOBSTERS	M	-	-	-	-	-	-	-
	F	-	-	-	-	-	-	-

DATE 9TH SEPTEMBER 1988								
NET EXPERIMENTAL		C1	C2	C3	C4			FLEET TOTAL NOS. OF FISH
CATCH POSITION IN NET UPPER, MIDDLE OR LOWER THIRD								
UPPER		-	1 MAC	-	-			1
MIDDLE		1 COLEY	1 WHIT	2 MAC 1 WHIT	1 MAC			6
LOWER		2 MAC	1 FLAT	1 MAC	1 MONK			5
NET TOTAL (NOS. OF FISH)		3	3	4	2			12
SHELLFISH								
EDIBLE CRAB	M	1	-	-	-			1
	F	-	-	-	-			-
LOBSTERS	M	-	-	-	-			-
	F	-	-	-	-			-

DATE 9TH SEPTEMBER 1988

NET CONTROL		FLEET D	FLEET E	FLEET F				FLEET TOTAL NOS. OF FISH
CATCH POSITION IN NET UPPER, MIDDLE OR LOWER THIRD								
UPPER		2 MAC	2 MAC 1 CATFISH 1 COLEY 1 COD	2 MAC				9
MIDDLE		2 MAC 2 WHIT	1 MAC 2 COLEY 3 WHIT 1 FLAT	1 COD 1 POUT 1 LING 2 FLAT				16
LOWER		1 MAC 1 POUT	1 WRASSE 3 MAC 1 WHIT 1 COLEY 1 FLAT	1 MAC 3 COLEY 1 COD 2 FLAT				16
NET TOTAL (NOS. OF FISH)		8	19	14				41
SHELLFISH								
EDIBLE CRAB	M	2	5	1				8
	F	1	3	2				6
LOBSTERS	M	-	1	10				11
	F	1	1	9				11

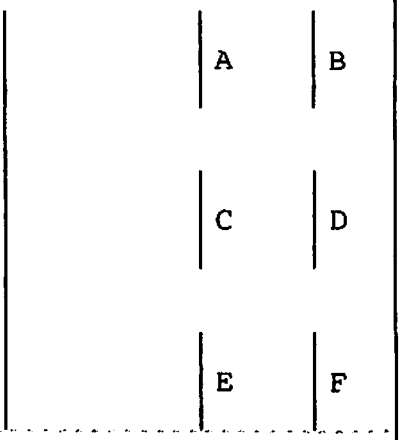
DAY 5

DATE 17-18/2/89 DAY 4 FOR 5						
FLEET	A	B	C	D	E	F
WEATHER	4-5 SW		-	-	-	-
SEASTATE	Moderate	-	-	-	-	-
TIME SHOT	1446	1443	1449	1440	1452	1455
TIME HAULED	0938	0908	1008	0838	1017	1035
FISHING TIME	18hrs 52min	18hrs 25min	19hrs 19min	17hrs 58min	19hrs 25min	19hrs 40min
DEPTH	18m	-	-	-	-	-
HAULING TIME	N/D	N/D	N/D	N/D	N/D	N/D
CLEARING						
GROUND TYPE	Hard	-	-	-	-	-
COMMENTS	Many undersized whiting being caught. One bass (48cm fl about 41b) caught.					

N/D = No Data

DAY 5

VESSEL	
DATE	18-19/2/89 DAY 5 FOR 6
	HW: 0209 & 1420
N	POSITION
	Approx. relative positions:



FLEET	NORTH END		SOUTH END	
	LATITUDE	LONGITUDE	LATITUDE	LONGITUDE
E	54°57'.58N	01°20'.43W	54°57'.37N	01°20'.29W
C	54°57'.70N	01°20'.49W	54°57'.61N	01°20'.43W
A	54°57'.95N	01°20'.60W	54°57'.72N	01°20'.50W
B	54°57'.98N	01°20'.43W	54°57'.68N	01°20'.22W
D	54°57'.66N	01°20'.20W	54°57'.44N	01°20'.06W
F	54°57'.41N	01°20'.02W	54°57'.07N	01°19'.83W

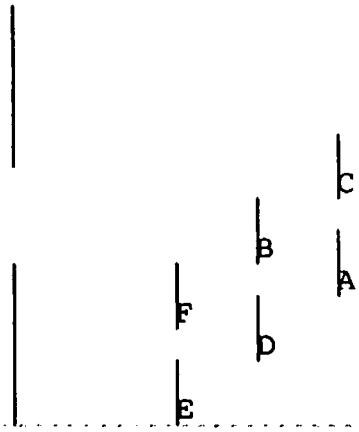
DAY 6

DATE 18-19/2/89 DAY 5 FOR 6						
FLEET	A	B	C	D	E	F
WEATHER	5-6 W		-	-	-	-
SEASTATE	Moderate	-	-	-	-	-
TIME SHOT	1059	1102	1057	1105	1055	1108
TIME HAULED	0754	0723	0824	0700	0845	0639
FISHING TIME	20hrs 55min	20hrs 21min	21hrs 27min	19hrs 55min	21hrs 50min	19hrs 31min
DEPTH	20m	-	-	-	-	-
HAULING TIME	N/D	-	-	-	-	-
CLEARING						
GROUND TYPE	N/D	-	-	-	-	-
COMMENTS						

N/D = No Data

DAY 6

VESSEL	
DATE	19-20/2/89 DAY 6 FOR 7
	HW: 0251 & 1458
N	POSITION
	Approx. relative positions:



FLEET	NORTH END		SOUTH END	
	LATITUDE	LONGITUDE	LATITUDE	LONGITUDE
C	54°55'.04N	01°20'.81W	54°54'.91N	01°20'.83W
A	54°54'.86N	01°20'.86W	54°54'.61N	01°20'.69W
B	54°54'.57N	01°20'.81W	54°54'.30N	01°20'.64W
D	54°54'.28N	01°20'.62W	54°54'.08N	01°20'.50W
F	54°53'.99N	01°20'.89W	54°53'.66N	01°20'.76W
E	54°53'.64N	01°20'.74W	54°53'.38N	01°20'.60W

DAY 7

DATE 19-20/2/89 DAY 6 FOR 7						
FLEET	A	B	C	D	E	F
WEATHER	5-6 W		-	-	-	-
SEASTATE	Moderate/Rough	-	-	-	-	-
TIME SHOT	0911	0913	0910	0918	0926	0921
TIME HAULED	1009	1030	0955	1058	1219	1118
FISHING TIME	24hrs 58min	25hrs 17min	24hrs 45min	25hrs 40min	26hrs 53min	25hrs 57min
DEPTH	18m	12m	18m	12m	10m	10m
HAULING TIME	N/D	-	-	-	-	-
CLEARING						
GROUND TYPE	Smooth	-	-	-	-	-
COMMENTS						

N/D = No Data

DAY 7

VESSEL	
DATE	20-21/2/89 DAY 7 FOR 8
	HW: 0326 & 1532
N	POSITION
	Approx. relative positions:

FLEET	NORTH END		SOUTH END	
	LATITUDE	LONGITUDE	LATITUDE	LONGITUDE
D	54°53'.91N	01°20'.71W	54°53'.70N	01°20'.63W
B	54°53'.92N	01°20'.82W	54°53'.58N	01°20'.72W
A	54°53'.58N	01°20'.72W	54°53'.34N	01°20'.48W
C	54°53'.44N	01°20'.68W	54°53'.33N	01°20'.63W
F	54°53'.68N	01°20'.58W	54°53'.40N	01°20'.38W
E	54°53'.70N	01°20'.46W	54°53'.36N	01°20'.30W

DAY 8

DATE 20-21/2/89 DAY 7 FOR 8						
FLEET	A	B	C	D	E	F
WEATHER	5-6 W-SW		-	-	-	-
SEASTATE	Moderate/Rough	-	-	-	-	-
TIME SHOT	1142	1141	1151	1138	1321	1233
TIME HAULED	1038	0921	1100	0906	0955	1114
FISHING TIME	22hrs 56min	21hrs 40min	23hrs 09min	21hrs 28min	20hrs 34min	22hrs 41min
DEPTH	18m	-	-	-	-	-
HAULING TIME	N/D	-	-	-	-	-
CLEARING						
GROUND TYPE	Mixed	-	-	-	-	-
COMMENTS						

N/D = No Data

DAY 8

VESSEL	
DATE	21-22/2/89 DAY 8 FOR 9
	HW: 0359 & 1604
N	POSITION
	Approx. relative positions:

FLEET	NORTH END		SOUTH END	
	LATITUDE	LONGITUDE	LATITUDE	LONGITUDE
E	54°53'.91N	01°19'.73W	54°53'.63N	01°19'.59W
B	54°54'.23N	01°19'.86W	54°53'.91N	01°19'.73W
D	54°54'.21N	01°20'.08W	54°54'.04N	01°19'.84W
C	54°53'.51N	01°19'.83W	54°53'.43N	01°19'.80W
A	54°53'.84N	01°19'.93W	54°53'.55N	01°19'.84W
F	54°54'.17N	01°20'.20W	54°53'.88N	01°19'.95W

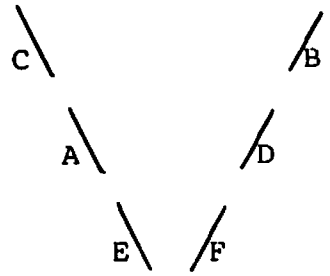
DAY 9

DATE 21-22/2/89 DAY 8 FOR 9						
FLEET	A	B	C	D	E	F
WEATHER	5-6 W	-	-	-	-	-
SEASTATE	Moderate	-	-	-	-	-
TIME SHOT	1135	1027	1134	1031	1024	1140
TIME HAULED	1150	0946	1225	1024	1119	1044
FISHING TIME	24hrs 15min	23hrs 19min	24hrs 51min	23hrs 53min	24hrs 55min	23hrs 04min
DEPTH	9m	15m	9m	15m	15m	9m
HAULING TIME	N/D	-	-	-	-	-
CLEARING						
GROUND TYPE	Mixed	-	-	-	-	-
COMMENTS						

N/D = No Data

DAY 9

VESSEL	
DATE	22-23/2/89 DAY 9 FOR 10
	HW: 0428 & 1634
N	POSITION
	Approx. relative positions:



FLEET	NORTH END		SOUTH END	
	LATITUDE	LONGITUDE	LATITUDE	LONGITUDE
C	54°52'.65N	01°17'.12W	54°52'.57N	01°17'.04W
A	54°52'.53N	01°17'.02W	54°52'.25N	01°16'.80W
E	54°52'.24N	01°16'.77W	54°51'.96N	01°16'.58W
F	54°52'.21N	01°16'.67W	54°51'.95N	01°16'.47W
D	54°52'.44N	01°16'.77W	54°52'.23N	01°16'.68W
B	54°52'.72N	01°16'.83W	54°52'.46N	01°16'.76W

DAY 10

DATE 22-23/2/89 DAY 9 FOR 10						
FLEET	A	B	C	D	E	F
WEATHER	6-7 SW	-	-	-	-	-
SEASTATE	Moderate/Rough	-	-	-	-	-
TIME SHOT	1312	1320	1310	1318	1314	1316
TIME HAULED	0951	0909	0938	1023	1112	1053
FISHING TIME	20hrs 39min	19hrs 49min	20hrs 28min	19hrs 25min	21hrs 58min	21hrs 37min
DEPTH	15m	20m	15m	20m	15m	20m
HAULING TIME	N/D	-	-	-	-	-
CLEARING						
GROUND TYPE	Smooth	-	-	-	-	-
COMMENTS	5-6 knots is normal shooting speed; 4 knots on this occasion due to weather.					

N/D = No Data

DAY 10

VESSEL	
DATE	23-24/2/89 DAY 10 FOR 11
	HW: 0458 & 1703
N	POSITION
	Approx. relative positions:

FLEET	NORTH END		SOUTH END	
	LATITUDE	LONGITUDE	LATITUDE	LONGITUDE
D	54°51'.16N	01°19'.37W	54°50'.99N	01°19'.29W
A	54°51'.11N	01°19'.45W	54°50'.84N	01°19'.27W
C	54°51'.31N	01°20'.00W	54°51'.18N	01°19'.99W
B	54°51'.50N	01°20'.06W	54°51'.18N	01°20'.01W
E	54°51'.96N	01°20'.43W	54°51'.63N	01°20'.27W
F	54°52'.31N	01°20'.56W	54°52'.00N	01°20'.37W

DAY 11

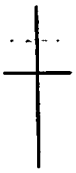
DATE 23-24/2/89 DAY 10 FOR 11

FLEET	A	B	C	D	E	F
WEATHER	6 W	-	-	-	-	-
SEASTATE	Moderate	-	-	-	-	-
TIME SHOT	1142	1150	1147	1138	1154	1202
TIME HAULED	0840	0758	0820	0854	0715	0700
FISHING TIME	20hrs 58min	20hrs 08min	20hrs 33min	21hrs 16min	19hrs 21min	18hrs 58min
DEPTH	9m	9m	9m	9m	9m	9m
HAULING TIME	N/D	-	-	-	-	-
CLEARING						
GROUND TYPE	Smooth	-	-	-	-	-
COMMENTS						

N/D = No Data

DAY 11

VESSEL	
DATE	24-25/2/89 DAY 11 FINAL DAY SHOOTING
	HW: 0527 & 1733
N	POSITION



FLEET	NORTH END		SOUTH END	
	LATTITUDE	LONGITUDE	LATITUDE	LONGITUDE
A	54°56'.59N	01°16'.31W	54°56'.26N	01°16'.27W
D	54°56'.85N	01°16'.24W	54°56'.61N	01°16'.36W
C	54°56'.45N	01°16'.06W	54°56'.33N	01°16'.00W
B	54°56'.65N	01°16'.33W	54°56'.31N	01°16'.04W
E	54°56'.74N	01°15'.93W	54°56'.42N	01°15'.95W
F	54°56'.84N	01°15'.93W	54°56'.52N	01°15'.83W

DAY 12

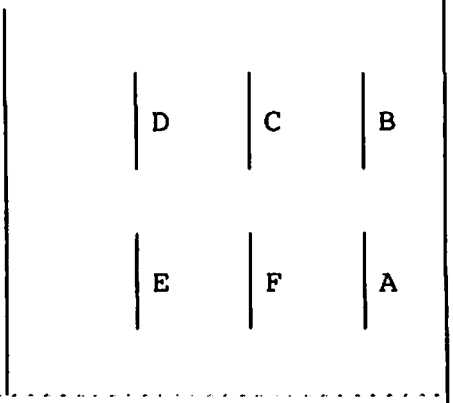
DATE 24-25/2/89 DAY 11 FOR 12						
FLEET	A	B	C	D	E	F
WEATHER	6-7 Moderating	-	-	-	-	-
SEASTATE	Long Swell, Rough	-	-	-	-	-
TIME SHOT	0946	1023	1020	0949	1029	1034
TIME HAULED	1040	1008	0840	0850	0812	0915
FISHING TIME	24hrs 54min	23hrs 45min	22hrs 20min	23hrs 01min	21hrs 43min	22hrs 41min
DEPTH	45m	45m	45m	45m	45m	45m
HAULING TIME	N/D	-	-	-	-	-
CLEARING						
GROUND TYPE	Rough/Wreck	-	-	-	-	-
COMMENTS	Nets shot on and around wrecks (last day of trials), deep water. Temperature - $10^{o}C$ (sea).					

N/D = No Data

DAY 1

VESSEL	NIKKI 'D' (SD46)
DATE	14-15/2/89 DAY 1 FOR 2
	HW: 0952 & 2221
N	POSITION

Approx. relative positions:



FLEET	NORTH END		SOUTH END	
	LATTITUDE	LONGITUDE	LATTITUDE	LONGITUDE
D	54°52'.61N	01°19'.89W	54°52'.32N	01°19'.83W
E	54°52'.29N	01°19'.81W	54°32'.06N	01°19'.71W
F	54°52'.06N	01°19'.67W	54°51'.87N	01°19'.55W
C	54°52'.22N	01°19'.64W	54°52'.10N	01°19'.63W
B	54°52'.39N	01°19'.57W	54°52'.18N	01°19'.50W
A	54°52'.17N	01°19'.52W	54°51'.99N	01°19'.44W

DAY 2

DATE 14-15/2/89 DAY 1 FOR 2 i.e. Shot Day 1, **Hauled Day 2** (Shot Day 2, **Hauled Day 3** etc.)

FLEET	A	B	C	D	E	F
WEATHER	Changeable Force 6-7 NW		-	-	-	-
SEASTATE	Moderate	-	-	-	-	-
TIME SHOT	1455	1450	1445	1430	1435	1440
TIME HAULED	0920	1005	0950	0748	0805	0854
FISHING TIME	18hrs 25min	19hrs 15min	19hrs 5min	17hrs 18min	17hrs 30min	18hrs 14min
DEPTH	18m	18m	17m	18m	16m	17m
HAULING TIME	10 minutes	10 minutes	5 minutes	10 minutes	10 minutes	10 minutes
CLEARING	Not Enough Data					
GROUND TYPE	Fine	-	-	-	-	-
COMMENTS	Very choppy. Forecast not good. Upper/Mid/Lower fish logging not carried out due to lack of fish					

DAY 2

DATE 14-15/2/89 DAY 1 FOR 2	i.e. shot day 1, hauled day 2 (shot day 2, hauled day 3 etc.)					
FLEET	A	B	C	D	F	E
WEATHER	Changeable force 6-7 [illegible]		–	–	–	–
SEASTATE	Moderate	–	–	–	–	–
TIME SHOT	1455	1150	1445	1430	1415	1440
TIME HAULED	0920	1005	0850	0715	0805	0835
FISHING TIME	18hrs 25min	19hrs 15min	18hrs 5min	17hrs 45min	17hrs 50min	18hrs 15min
DEPTH	18m	18m	17m	18m	18m	17m
HAULING TIME	15 minutes	10 minutes	5 minutes	10 minutes	15 minutes	10 minutes
CLEANING	Not enough data					
GROUND TYPE	Fine	–	–	–	–	–
COMMENTS	Very choppy. Forecast not good. Upper/lower fish [illegible] due to lack of fish					

DAY 2

VESSEL	
DATE	15-16/2/89 DAY 2 FOR 3
	HW: 1119 & 2357
N	POSITION
	Approx. relative positions:

B D

C E

A F

FLEET	NORTH END		SOUTH END	
	LATITUDE	LONGITUDE	LATITUDE	LONGITUDE
A	54°52'.51N	01°17'.70W	54°52'.22N	01°17'.61W
C	54°62'.68N	01°17'.75W	54°52'.56N	01°17'.73W
B	54°53'.03N	01°17'.74W	54°52'.71N	01°17'.78W
D	54°53'.05N	01°17'.50W	54°52'.79N	01°17'.45W
E	54°52'.76N	01°17'.45W	54°52'.41N	01°17'.38W
F	54°52'.39N	01°17'.36W	54°52'.07N	01°17'.35W

DAY 3

DATE 15-16/2/89 DAY 2 FOR 3

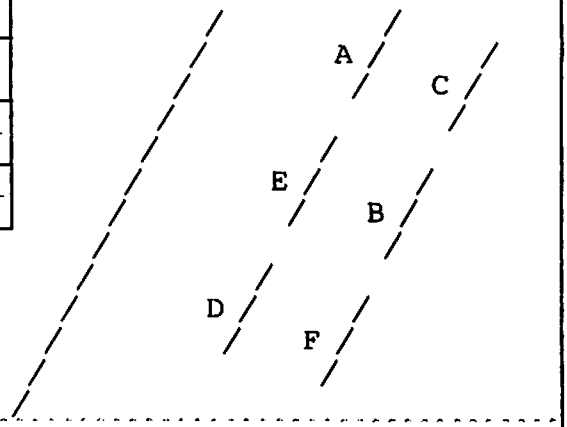
FLEET	A	B	C	D	E	F
WEATHER	Changeable Force 5-6 W		-	-	-	-
SEASTATE	Moderate	-	-	-	-	-
TIME SHOT	1030	1040	1035	1050	1055	1100
TIME HAULED	0823	0740	0800	0850	0907	0925
FISHING TIME	21hrs 53min	21hrs 00min	21hrs 25min	22hrs 00min	22hrs 12min	22hrs 25min
DEPTH	18.3m	22m	18.3m	22m	22m	24m
HAULING TIME						
CLEARING	Not Enough Data					
GROUND TYPE	Hard	-	-	-	-	-
COMMENTS	No fish. Unsettled weather continues.					

		–	–	–	–	–
		–	–	–	–	–
			–	–	–	–

DWG 3

DAY 3

VESSEL	
DATE	16-17/2/89 DAY 3 FOR 4
	HW: 1238 ONLY
N	POSITION
	Approx. relative positions:



FLEET	NORTH END		SOUTH END	
	LATITUDE	LONGITUDE	LATITUDE	LONGITUDE
D	54°54'.35N	01°20'.80W	54°54'.13N	01°20'.68W
E	54°54'.54N	01°20'.86W	54°54'.36N	01°20'.82W
A	54°54'.90N	01°20'.80W	54°54'.60N	01°20'.84W
C	54°54'.88N	01°20'.73W	54°54'.79N	01°20'.69W
B	54°54'.72N	01°20'.70W	54°54'.45N	01°20'.60W
F	54°54'.31N	01°20'.62W	54°54'.04N	01°20'.49W

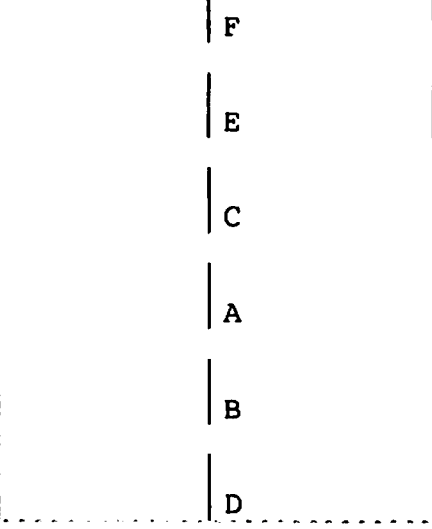
DAY 4

DATE 16-17/2/89 DAY 3 FOR 4

FLEET	A	B	C	D	E	F
WEATHER	Cloud. Wind 4-5 S-SW		-	-	-	-
SEASTATE	Moderate/Rough	-	-	-	-	-
TIME SHOT	1112	1127	1126	1120	1117	1134
TIME HAULED	0923	1045	1130	1103	1015	1150
FISHING TIME	22hrs 11min	23hrs 18min	24hrs 04min	23hrs 43min	22hrs 58min	24hrs 16min
DEPTH	18m	18m	18m	18m	20m	20m
HAULING TIME	15 minutes	10 minutes	5 minutes	20 minutes	15 minutes	20 minutes
CLEARING	Difficult due to amount of rocks and rubbish in the nets. Many bullheads.					
GROUND TYPE	Hard	-	-	-	-	-
COMMENTS	Nets turned over in port due to bad seas. Nets to be re-shot north of River Wear.					

DAY 4

VESSEL	
DATE	17-18/2/89 DAY 4 FOR 5
	HW: 0114 & 1335
N	POSITION
	Approx. relative positions:



FLEET	NORTH END		SOUTH END	
	LATITUDE	LONGITUDE	LATITUDE	LONGITUDE
D	54°55'.86N	01°20'.25W	54°55'.60N	01°20'.36W
B	54°56'.25N	01°20'.15W	54°55'.91N	01°20'.17W
A	54°56'.52N	01°20'.25W	54°56'.28N	01°20'.17W
C	54°56'.67N	01°20'.29W	54°56'.56N	01°20'.26W
E	54°57'.01N	01°20'.29W	54°56'.72N	01°20'.28W
F	54°57'.35N	01°20'.32W	54°57'.04N	01°20'.25W

DAY (2)

ATTRIBUTE	FLEET	NET CODE	SUBSTRATE: HARD/FINE/MIX	DEPTH (m)	TIME SHOT h	TIME SHOT m	TIME HAULED h	TIME HAULED m	BOTTOM TIME h	BOTTOM TIME m	WATER TEMP °C	Catch: COD No.	COD kg	WHITING No.	WHITING kg	DOVER No.	DOVER kg	PLAICE No.	PLAICE kg	By-catch: BROWN CRAB M	BROWN CRAB F	SHORE CRAB M	SHORE CRAB F	LOBS-TER M	LOBS-TER F	DEBRIS kg	EASE OF CLEARING GOOD G	EASE OF CLEARING FAIR F	EASE OF CLEARING POOR P	TURNOVER TIME h	TURNOVER TIME m	ORIENT-ATION
'TEST' FLEET	A	A_1																														
		A_2																														
		A_3																														
		A_4																														
		A_5																														
		A_6																														
'TEST' FLEET	B	A_7																														
		B_1																														
		B_2										8	8.5	7	2.5	—		—														
		B_3																														
		B_4																														
		B_5																														
'TEST' FLEET	C	B_6																														
		B_7																														
		C_1																														
		C_2																														
		C																														
		C																														
'CONTROL' FLEET	D	D_1																														
		D_2																														
		D_3																														
		D_4																														
		D_5																														
		D_6																														
'CONTROL' FLEET	E	E_1																														
		E_2																														
		E_3										12	20.0	8	3	1	0.75	1	0.5													
		E_4																														
		E_5																														
		E_6																														
CONTROL' FLEET	F	F_1																														
		F_2																														
		F_3																														
		F_4																														
		F_5																														

GEAR MAINLY ON HARD GROUND + SOME PATCHES OF MIXED HARD & FINE

CONTROL NETS D, E, F SEAFISH NETS A, B, C

APPROX. 24 HRS FOR ALL GEAR.

TITLE **NE Coast Trials** SHEET

DATE 15/02/89 WEATHER 6-7 W'LY.

HW LW SEA NW'LY SWELL

COMMENTS: DAY (2)

V. POOR WEATHER.

NO CRABS IN EXPERIMENTAL NETS - ANTI-CRAB BARRIERS APPEAR TO BE WORKING BUT ONLY LIMITED NOS. ENCOUNTERED.

24 CRABS TOTAL. ALL TAKEN FROM CONTROL NETS. (IMMATURE BROWN CRAB.)

SUSPECTED SEAL ACTIVITY IN AREA OF GEAR

NW'LY SWELL KNOCKED BACK QUICKLY WITH STRONG WESTERLY WIND.

ALL FISH TALLIED AS PER FLEET - INSUFFICIENT NOS TO RECORD FOR INDIVIDUAL NETS!

DAY (3)

ATTRIBUTE	FLEET	NET CODE	SUBSTRATE: HARD/FINE/MIX	DEPTH (m)	TIME SHOT hr	TIME SHOT m	TIME HAULED hr	TIME HAULED m	BOTTOM TIME hr	BOTTOM TIME m	WATER TEMP °C	Catch: COD No.	Catch: COD kg	Catch: No.	Catch: kg	Catch: No.	Catch: kg	Catch: No.	Catch: kg	By-catch: BROWN CRAB M	BROWN CRAB F	SHORE CRAB M	SHORE CRAB F	LOBSTER M	LOBSTER F	DEBRIS kg	EASE OF CLEARING G	EASE OF CLEARING F	EASE OF CLEARING P	TURNOVER TIME	ORIENTATION
'TEST' FLEET	A	A_1																													
		A_2																													
		A_3																													
		A_4																													
		A_5																													
		A_6																													
'TEST' FLEET	B	A_7																													
		B_1																													
		B_2																													
		B_3																													
		B_4																													
		B_5																													
'TEST' FLEET	C	B_6																													
		B_7																													
		C_1										6	UNDERSIZE																		
		C_2																													
		C																													
		C																													
'CONTROL' FLEET	D	D_1	ALL SHOT ON HARD GROUND.																												
		D_2																													
		D_3																													
		D_4																													
		D_5																													
		D_6																													
'CONTROL' FLEET	E	E_1																													
		E_2																													
		E_3																													
		E_4																													
		E_5																													
		E_6																													
CONTROL' FLEET	F	F_1																													
		F_2																													
		F_3																													
		F_4																													
		F_5																													

TITLE: NE Coast Trials SHEET

DATE 16/02/89 WEATHER WNW 5-6

HW LW SEA SLIGHT SWELL

COMMENTS: DAY (3)

SHOT GEAR ON INSIDE GROUND - SOUTH OF SOUTH PIER.

ONLY ONE OTHER LOCAL VESSEL HAULED - REPORT OF ONLY 3 CODLINGS FROM 7 NETS.

14 Br/Crabs TOTAL. ALL BUT ONE FROM CONTROL NETS

EVIDENCE OF SEAL ACTIVITY.

WIND CAUSING SOME PROBLEMS HAULING.

DAY ④.

ATTRIBUTE	FLEET	NET CODE	SUBSTRATE: HARD/FINE/MIX	DEPTH (m)	TIME SHOT h	TIME HAULED h	BOTTOM TIME h	WATER TEMP °C	Catch: COD No.	COD kg	Na	kg	No.	kg	No.	kg	By-catch: BROWN CRAB M	F	SHORE CRAB M	F	LOBSTER M	F	DEBRIS kg	EASE OF CLEARING G	F	P	TURNOVER TIME h	ORIENTATION
'TEST' FLEET	A	A_1	ALL CLEAR SETT ON HARD GROUND.																									
		A_2																										
		A_3																										
		A_4																										
		A_5																										
		A_6																										
'TEST' FLEET	B	A_7																										
		B_1																										
		B_2																										
		B_3																										
		B_4																										
		B_5																										
'TEST' FLEET	C	B_6																										
		B_7																										
		C_1							ALL FLEETS →																			
		C_2																										
		C																										
		C																										
'CONTROL' FLEET	D	D_1																										
		D_2																										
		D_3																										
		D_4																										
		D_5																										
		D_6																										
'CONTROL' FLEET	E	E_1																										
		E_2																										
		E_3																										
		E_4																										
		E_5																										
		E_6																										
'CONTROL' FLEET	F	F_1																										
		F_2																										
		F_3																										
		F_4																										
		F_5																										

BOTTOM TIME ↓

STROPS + BOTTOM "RUBBISH" IN ALL BUT STROP NETS.

TITLE **NE Coast Trials** SHEET

DATE 17/02/89 WEATHER S–SE'LY 6–7

HW LW SEA HEAVY SWELL

COMMENTS: DAY (4)

POOR WEATHER FRESH TO STRONG SOUTHERLY VEERING S'W'LY. HEAVY SWELL ON INSIDE GROUNDS.

PICKED-UP LARGE QUANTITY OF STONES DUE TO HEAVY SWELL ON INSIDE GROUND STIRRING-UP SEABED. SOME NET DAMAGE RESULTED

NO DAMAGE TO STROP NETS

20 CODLING = 20 kg
8 COLIES = 5 kg
15 kg { PLAICE = 3 kg
FLOUNDERS = 12 kg

10 Br/CRABS

ALL WTS. ARE APPROX.

BOTH STROP NETS + MEM BARRIER NETS CATCHING FLATS IN NETTING IMMEDIATELY ABOVE BARRIER STRIP. CONTROLS DID CATCH MORE FLATS BUT QUANTITIES INSUFFICIENT TO DRAW CONCLUSIONS.

POOR WEATHER + SEA CONDITIONS MAKING DATA RECORDING DIFFICULT. REPORT of SOME IMPROVED FISHING TO NORTH OF PIERS SHOT BACK PM.

DAY (5)

ATTRIBUTE	FLEET	NET CODE	SUBSTRATE: HARD/FINE/MIX	DEPTH (m)	TIME SHOT h	TIME HAULED h	BOTTOM TIME h	WATER TEMP °C	Catch: COD-LING No.	COD-LING kg	U/SIZE WHITING No.	U/SIZE WHITING kg	BASS No.	BASS kg	FLOUNDER No.	FLOUNDER kg	By-catch: BROWN CRAB M	BROWN CRAB F	SHORE CRAB M	SHORE CRAB F	LOBSTER M	LOBSTER F	DEBRIS kg	EASE OF CLEARING G	EASE OF CLEARING F	EASE OF CLEARING P	TURNOVER TIME h	ORIENTATION
'TEST' FLEET	A	A_1																										
		A_2																										
		A_3							2	—			1	—														
		A_4																										
		A_5																										
		A_6	SUBSTRATE: V. HARD GROUND - KELP BEDS.																									
'TEST' FLEET	B	A_7																										
		B_1																										
		B_2							1	—	12	—																
		B_3																										
		B_4																										
		B_5																										
'TEST' FLEET	C	B_6																										
		B_7																										
		C_1							1	—					1	—	1											
		C_2																										
		C																										
		C																										
'CONTROL' FLEET	D	D_1																										
		D_2																										
		D_3	V. HARD GROUND						1	—	12	—					4											
		D_4																										
		D_5																										
		D_6																										
'CONTROL' FLEET	E	E_1																										
		E_2																										
		E_3							2	—							6					1						
		E_4																										
		E_5																										
		E_6																										
'CONTROL' FLEET	F	F_1																										
		F_2																										
		F_3							7	—							6					3						
		F_4																										
		F_5																										

THIS NE Coast Trials SHEET

DATE 18/02/89 WEATHER S-SE 3-4

HW LW SEA MOD. SWELL.

COMMENTS: DAY (5)

ALL VESSELS REPORTING V. POOR CATCHES SEALS STILL ACTIVE ON INSIDE GROUNDS - POOR WEATHER PREVENTING MOVE TO OUTSIDE MARKS.

SOUTH END OF FLEETS HEAVY WITH "RUBBISH" EXPERIMENTAL NETS CLEANER THAN CONTROL.

ALL BUT 1 CRAB FROM CONTROL NETS

DAY (6)

ATTRIBUTE	FLEET	NET CODE	SUBSTRATE: HARD/FINE/MIX	DEPTH (m)	TIME SHOT h	TIME SHOT m	TIME HAULED h	TIME HAULED m	BOTTOM TIME h	BOTTOM TIME m	WATER TEMP °C	Catch: COD No.	Catch: COD kg	Catch: No.	Catch: kg	Catch: No.	Catch: kg	Catch: No.	Catch: kg	By-catch: BROWN CRAB M	BROWN CRAB F	SHORE CRAB M	SHORE CRAB F	LOBS-TER M	LOBS-TER F	DEBRIS kg	EASE OF CLEARING GOOD G	FAIR F	POOR P	TURNOVER TIME	ORIENT-ATION	COMMENTS
'TEST' FLEET	A	A_1																														TITLE: NE Coast Trials SHEET
		A_2																														DATE 19/02/89 WEATHER SW-W-5-9
		A_3																														HW LW SEA v. ROUGH.
		A_4																														ZERO CATCH
		A_5																														
		A_6																														
'TEST' FLEET	B	A_7																														
		B_1																														
		B_2																														ZERO CATCH
		B_3																														
		B_4																														
		B_5																														
'TEST' FLEET	C	B_6																														
		B_7																														
		C_1																														ZERO
		C_2																														
		C																														
		C																														
'CONTROL' FLEET	D	D_1																														SOME CRABS IN CONTROLS.
		D_2																														
		D_3																		2												
		D_4																														
		D_5																														
		D_6																														
'CONTROL' FLEET	E	E_1																														SHOT EXPERIMENTAL & CONTROL GEAR ON INSIDE GROUNDS BECAUSE OF POOR WX. CONDITIONS.
		E_2																														
		E_3																		8												
		E_4																														
		E_5																														
		E_6																														
CONTROL' FLEET	F	F_1																														
		F_2																														
		F_3										2								6												
		F_4																														
		F_5																														

DAY (7)

TITLE: NE Coast Trials SHEET

DATE 20/02/89 WEATHER W-SW - 7-8

HW LW SEA

COMMENTS: DAY (7)

ATTRIBUTE	FLEET	NET CODE	SUBSTRATE: HARD/FINE/MIX	DEPTH (m)	TIME SHOT	TIME HAULED	BOTTOM TIME	WATER TEMP °C	Catch: COD-ZING No.	COD-ZING kg	WHITING No.	WHITING kg	COLIES No.	COLIES kg	FLATS No.	FLATS kg	By-catch: BROWN CRAB M	BROWN CRAB F	SHORE CRAB M	SHORE CRAB F	LOBSTER M	LOBSTER F	DEBRIS kg	EASE OF CLEARING G	EASE OF CLEARING F	EASE OF CLEARING P	TURNOVER TIME	ORIENTATION
'TEST' FLEET	A	A_1																										
		A_2																										
		A_3									2	–			2	PLAICE												
		A_4																										
		A_5																										
		A_6																										
'TEST' FLEET	B	A_7																										
		B_1																										
		B_2							3		7		7		8													
		B_3	SCRT.																									
		B_4																										
		B_5																										
'TEST' FLEET	C	B_6	GROUND																									
		B_7																										
		C_1							5		6		2															
		C_2																										
		C																										
		C																										
'CONTROL' FLEET	D	D_1	MIXED																									
		D_2																										
		D_3							3		3		1				2											
		D_4																										
		D_5																										
		D_6																										
'CONTROL' FLEET	E	E_1																										
		E_2																										
		E_3							–	38kg							2											
		E_4																										
		E_5																										
		E_6																										
CONTROL' FLEET	F	F_1																										
		F_2								1x POLLACK																		
		F_3							7		8		22		10						6							
		F_4																										
		F_5																										

IST. FLEET OF EXP. NETS SHOWED PROMISING RESULTS AT FIRST THEN TAILED OFF

ALL VESSELS REPORTING POOR CATCHES.

EXPERIMENTAL NETS CATCHING FLATS.

ONLY CRABS CAUGHT CAME FROM CONTROL NETS.

GOOD CATCH.

DAY (8)

TITLE: NE Coast Trials SHEET

DATE 21/02/84 WEATHER SW-S 4-5

HW LW SEA ROUGH

COMMENTS: DAY (8)

ATTRIBUTE	FLEET	NET CODE	SUBSTRATE: HARD/FINE/MIX	DEPTH (m)	TIME SHOT h	TIME SHOT m	TIME HAULED h	TIME HAULED m	BOTTOM TIME h	BOTTOM TIME m	WATER TEMP °C	Catch: COD No.	COD kg	COLVES No.	COLVES kg	WHITING No.	WHITING kg	FLATS No.	FLATS kg	By-catch: BROWN CRAB M	BROWN CRAB F	SHORE CRAB M	SHORE CRAB F	LOBSTER M	LOBSTER F	DEBRIS kg	EASE OF CLEARING G	EASE OF CLEARING F	EASE OF CLEARING P	TURNOVER TIME	ORIENTATION	COMMENTS
'TEST' FLEET	A	A1																														WEATHER FRESHENING.
		A2																														
		A3	HENDON.											2		6		2														NO CRABS
		A4																														BEST REPORT 1 BOX OF MIXED FISH.
		A5																														
		A6																														
'TEST' FLEET	B	A7	INSIDE AT																													VESSELS REPORTING
		B1																														CONTINUED SEAL ACTIVITY.
		B2												8		2		1														NO CRABS.
		B3																														
		B4																														
		B5																														
'TEST' FLEET	C	B6	ANCHORED																													
		B7																														
		C1										1				5		2		2												SMALL WHITING.
		C2																														
		C																														
		C																														
'CONTROL' FLEET	D	D1	HARD																													
		D2																														
		D3												6		1		9														NO CRABS
		D4	ON																													
		D5																														
		D6																														
'CONTROL' FLEET	E	E1	STD.																													MANY U/SIZE COD & WHITING RELEASED.
		E2																														
		E3										4				18		9		4				1								
		E4																														
		E5																														
		E6																														
'CONTROL' FLEET	F	F1																														
		F2																														
		F3										1				12		4		6				1								
		F4																														
		F5																														

DAY (9)

TITLE: NE Coast Trials SHEET

DATE 22/09/89 WEATHER S-SW -6-7

HW LW SEA MOD. SWELL

COMMENTS: DAY (9)

ATTRIBUTE	FLEET	NET CODE	SUBSTRATE: HARD/FINE/MIX	DEPTH (m)	TIME SHOT	TIME HAULED	BOTTOM TIME	WATER TEMP °C	Catch: COD No.	COD kg	COLIES No.	COLIES kg	WHITING No.	WHITING kg	FLATS No.	FLATS kg	By-catch: BROWN CRAB M	BROWN CRAB F	SHORE CRAB M	SHORE CRAB F	LOBSTER M	LOBSTER F	DEBRIS kg	EASE OF CLEARING G	EASE OF CLEARING F	EASE OF CLEARING P	TURNOVER TIME	ORIENTATION
'TEST' FLEET	A	A_1																										
		A_2																										
		A_3											2															
		A_4																										
		A_5																										
		A_6																										
'TEST' FLEET	B	A_7																										
		B_1																										
		B_2													2													
		B_3																										
		B_4																										
		B_5																										
'TEST' FLEET	C	B_6																										
		B_7																										
		C_1							2		10										2							
		C_2																										
		C																										
		C																										
'CONTROL' FLEET	D	D_1																										
		D_2																										
		D_3									1		1		1													SEAL DAMAGE.
		D_4																										
		D_5																										
		D_6																										
'CONTROL' FLEET	E	E_1																										
		E_2																										BETTER RESULT FROM
		E_3							11		1				1		1											THIS NET.
		E_4																										
		E_5																										
		E_6																										
CONTROL' FLEET	F	F_1																										
		F_2																										
		F_3							2				1		1		5											SEAL DAMAGE.
		F_4																										
		F_5																										

V. POOR RESULTS.

REPORTS of 1-2 BOXES FROM 'GROUND EDGE'.

SEAL DAMAGE.

DAY (10)

TITLE: NE Coast Trials SHEET

DATE 23/02/89 WEATHER S/W 6-7

HW LW SEA ROUGH.

COMMENTS: DAY (10)

POOR WEATHER SNOW SHOWERS.

SHOT BACK CLOSE TO BEACH AT SEAHAM.

ZERO CATCH.

BETTER CATCH.

ATTRIBUTE	FLEET	NET CODE	SUBSTRATE: HARD/FINE/MIX	DEPTH (m)	TIME SHOT h	TIME SHOT m	TIME HAULED h	TIME HAULED m	BOTTOM TIME h	BOTTOM TIME m	WATER TEMP °C	Catch: COD-LING No.	COD-LING kg	COLIES No.	COLIES kg	WHITING No.	WHITING kg	FLATS No.	FLATS kg	By-catch: BROWN CRAB M	BROWN CRAB F	SHORE CRAB M	SHORE CRAB F	LOBSTER M	LOBSTER F	DEBRIS kg	EASE OF CLEARING GOOD G	EASE OF CLEARING FAIR F	EASE OF CLEARING POOR P	TURNOVER TIME	ORIENTATION
'TEST' FLEET	A	A_1																													
		A_2																													
		A_3										1																			
		A_4																													
		A_5																													
		A_6																													
'TEST' FLEET	B	A_7	SHOT ON MIXED GROUND.																												
		B_1																													
		B_2																1													
		B_3																													
		B_4																													
		B_5																													
'TEST' FLEET	C	B_6																													
		B_7																													
		C_1														1															
		C_2																													
		C																													
		C																													
'CONTROL' FLEET	D	D_1																													
		D_2																													
		D_3																													
		D_4																													
		D_5																													
		D_6																													
'CONTROL' FLEET	E	E_1																													
		E_2																													
		E_3										2						2		4											
		E_4																													
		E_5																													
		E_6																													
CONTROL' FLEET	F	F_1																													
		F_2																													
		F_3										17		1		3		3						1							
		F_4																													
		F_5																													

NE Coast Trials

SHEET

DATE 24/02/89 WEATHER SW - 3 - SE 8

HW | LW | SEA

COMMENTS: DAY (11)

ATTRIBUTE	FLEET	NET CODE	SUBSTRATE: HARD/FINE/MIX	DEPTH (m)	TIME SHOT hr	TIME SHOT m	TIME HAULED hr	TIME HAULED m	BOTTOM TIME hr	BOTTOM TIME m	WATER TEMP °C	Catch: COD No.	COD kg	WHITING No.	WHITING kg	FLATS No.	FLATS kg	COLIES No.	COLIES kg	By-catch: BROWN CRAB M	BROWN CRAB F	SHORE CRAB M	SHORE CRAB F	LOBSTER M	LOBSTER F	DEBRIS kg	EASE OF CLEARING GOOD G	EASE OF CLEARING FAIR F	EASE OF CLEARING POOR P	TURNOVER TIME	ORIENTATION
'TEST' FLEET	A	A_1										4																			
		A_2																													
		A_3																													
		A_4																													
		A_5																													
		A_6																													
'TEST' FLEET	B	A_7																													
		B_1																													
		B_2																													
		B_3																													
		B_4																													
		B_5																													
'TEST' FLEET	C	B_6																													
		B_7																													
		C_1																													
		C_2																													
		C																													
		C																													
'CONTROL' FLEET	D	D_1																													
		D_2																													
		D_3										4		1		2															
		D_4																													
		D_5																													
		D_6																													
'CONTROL' FLEET	E	E_1																													
		E_2																													
		E_3																													
		E_4																													
		E_5																													
		E_6																													
CONTROL' FLEET	F	F_1																													
		F_2																													
		F_3												2		8															
		F_4																													
		F_5																													

SHOT GEAR IN VICINITY OF WRECK
WEATHER FRESHENING RAPIDLY LATE P.M.

ZERO

ZERO

IMMATURE/UNDERSIZE FISH.

ZERO.

NO SHELLFISH CAUGHT.

DAY (12)

ATTRIBUTE	FLEET	NET CODE	SUBSTRATE: HARD/FINE/MIX	DEPTH (m)	TIME SHOT hr	TIME SHOT m	TIME HAULED hr	TIME HAULED m	BOTTOM TIME hr	BOTTOM TIME m	WATER TEMP °C	Catch: COD No.	Catch: COD kg	Catch: Na	Catch: kg	Catch: No.	Catch: kg	Catch: No.	Catch: kg	By-catch: BROWN CRAB M	BROWN CRAB F	SHORE CRAB M	SHORE CRAB F	LOBSTER M	LOBSTER F	DEBRIS kg	EASE OF CLEARING G	EASE OF CLEARING F	EASE OF CLEARING P	TURNOVER TIME	ORIENTATION
'TEST' FLEET	A	A_1																													
		A_2																													
		A_3																													
		A_4																													
		A_5																													
		A_6																													
'TEST' FLEET	B	A_7																													
		B_1																													
		B_2																													
		B_3																													
		B_4																													
		B_5																													
'TEST' FLEET	C	B_6																													
		B_7																													
		C_1										6																			
		C_2																													
		C																													
		C																													
'CONTROL' FLEET	D	D_1																													
		D_2																													
		D_3																													
		D_4																													
		D_5																													
		D_6																													
'CONTROL' FLEET	E	E_1																													
		E_2																													
		E_3										10								15 UNDERSIZED BROWN CRABS											
		E_4																													
		E_5																													
		E_6																													
'CONTROL' FLEET	F	F_1																													
		F_2																													
		F_3																													
		F_4																													
		F_5																													

THIS NE Coast Trials SHEET

DATE 25/02/89 WEATHER SW'LY 6.

HW LW SEA HEAVY SWELL

COMMENTS: DAY (12)

DELAYED SAILING DUE TO V. POOR WEATHER.

ZERO

ZERO

GOOD CODLING

ZERO

MANY ROCKS. GOOD CODLING/COD.

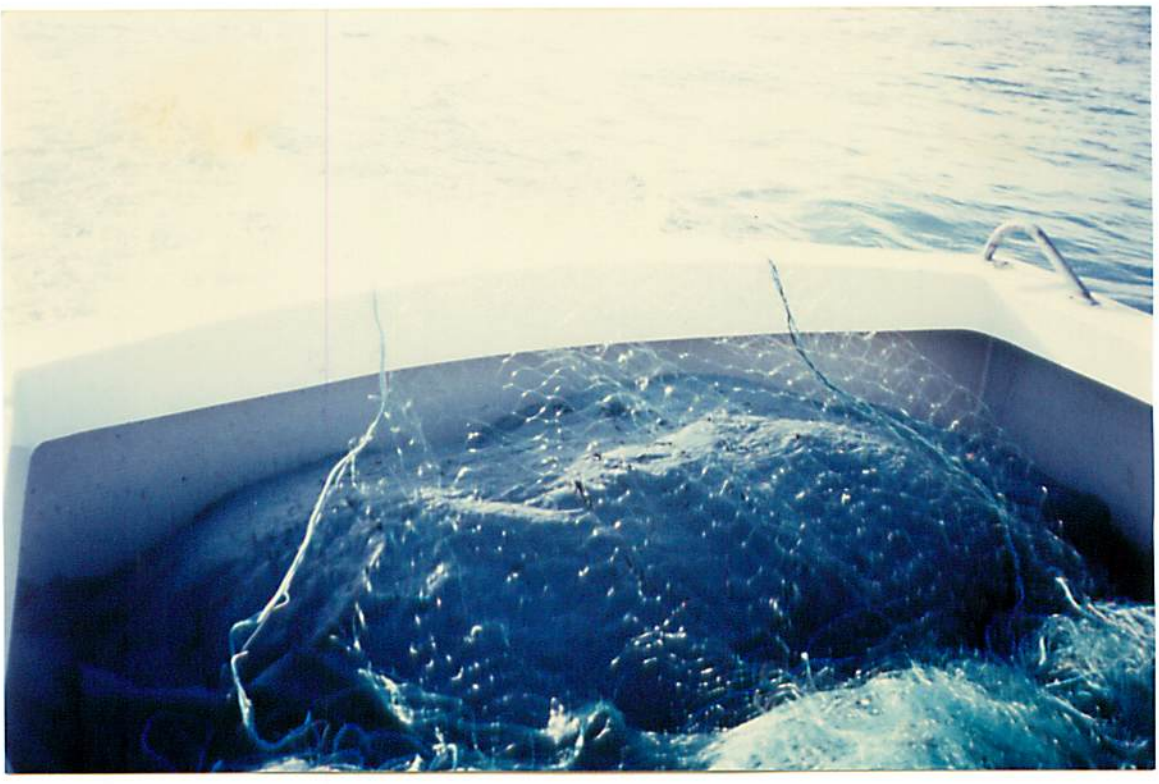
ZERO.

PHOTOGRAPHS SHOWING THE EXPERIMENTAL, BARRIER RIGGED NETS AND THE FISHING OPERATION ABOARD M.F.V. NIKKI-D (FROM SECOND TRIAL 14/2/89 - 25/2/89)

SHOWING CONSTRUCTION OF MESH BARRIER STRIP

SHOWING CONSTRUCTION OF STROP BARRIER STRIPS

SHOWING NETS IN STOWED POSITION READY FOR SHOOTING



SHOWING NETS BEING SHOT OVER TRANSOM STERN

SHOWING HAULING OPERATION - STROP BARRIER NETS

SHOWING 'TURNING-OVER' OPERATION

BOTTOM PHOTO SHOWING MESH BARRIER NET

SHOWING 'TURNING-OVER' OPERATION