

International Council for the
Exploration of the Sea.

C.M.1973/B:5
Gear and Behaviour Committee

THE ISAACS-KIDD MIDWATER TRAWL (IKMT);
EXPERIENCES WITH A NEW WAY OF RIGGING.

17573

by

H.C. Besançon

VLIZ (vzw)

VLAAMS INSTITUUT VOOR DE ZEE

FLANDERS MARINE INSTITUTE

Oostende - Belgium



Vlaams Instituut voor de Zee
Flanders Marine Institute

Netherlands Institute for
Fishery Investigations,
P.O. Box 68,
IJmuiden.

For the purpose of collecting plankton and other bathypelagic biological specimens biologists of the Institute, like many other scientists, make use of the IKMT. It may be recalled that this fishing-gear consists of a net which groundrope and headline are attached to a dihedral depressor-vane and a spreader-bar respectively. The gear is linked to a single towing-wire through a 3-leg bridle which leaves the area in front of the netmouth unobstructed.

As the designers John D. Isaacs and Lewis W. Kidd themselves point out in their final report dated January 1953, the IKMT is very sensitive to the vertical movement of the towing vessel as a result of waves and swell, in particular when a short length of wire is used (40-100 meter). They also recommend the depressor-vane to be constructed in a manner such that it could be folded by messenger or other means so as to simplify the retrieval of the trawl by eliminating the depressing action of the vane.

Since the introduction of the IKMT in 1953 a new fishing technique has been firmly established: the one-boat pelagic trawl, using wing-shaped Süberkrüb doors for netspread and depth-regulation.

As with the IKMT, the area in front of the trawlmouth is left unobstructed by the use of two outward-sheering doors.

Of course the vertical movement of the towing vessel's stern does effect the net; but through the weight of the doors and the length of the bridles between doors and net, the impact of this movement is dampened.

Due to its rigging, the one-boat pelagic trawl responds in an elastic way to alternating warp-loads and thus has good endurance: under less favourable weather-conditions, whereas experience with the IKMT, gathered in year-round operation on the North Sea shows that a sea-state resulting from a continuing wind force 5 BFT, limits its operation.

Contrary to the IKMT, the retrieval of the pelagic trawl does not cause any problem because the higher the warphauling-speed is, the better will be the lift-performance of the doors, resulting in a high ascend-rate of the net.

When it was decided to investigate the migration of eel larvae and elvers (*Leptocephalus brevirostris*) between Europe and the Azores with R.V. Tridens it was found necessary to review the usefulness of IKMT for this particular voyage into this part of the Ocean not familiar to scientists of the Institute.

In view of the above mentioned operational limitations and with regard to swell- and wave conditions to be expected, handling the IKMT was estimated as possibly troublesome. Therefore, the gear-section of the Institute designed a pelagic trawl (nr. 577) with 400 kg-heavy Suberkrüb doors of 2.6 square meter to match. The drawing shows how the original IKMT, consisting of polyamid canvas with mesh-size of 2,25 square millimeter, is attached inside the tunnel and the cod-end of the pelagic trawl.

Trawl-warps consist of two 1500 meter long steel wires, diameter 14.4 mm, construction 6 x 41 Warrington Seal with rope heart, breaking-load 13.1 ton. Bridles are made of polypropene coated stainless steel combination-rope, diameter 14 mm. The warps should be considered as multi-purpose wire; in fact they are too heavy for this particular gear.

On board R.V. Tridens, between May 29 and June 9, ten hauls were made in depths between 150 and 350 meter. In addition one trial-haul to an estimated depth of 700 meter was made. A depth of net to warplength ratio of 1 : 2 at a ship's speed of approximately two knots was established with the use of a netsounder on the headline, cable-linked to the ship. Paying out the warps slowly resulted in a descend-rate of 20 meter per minute (preliminary data).

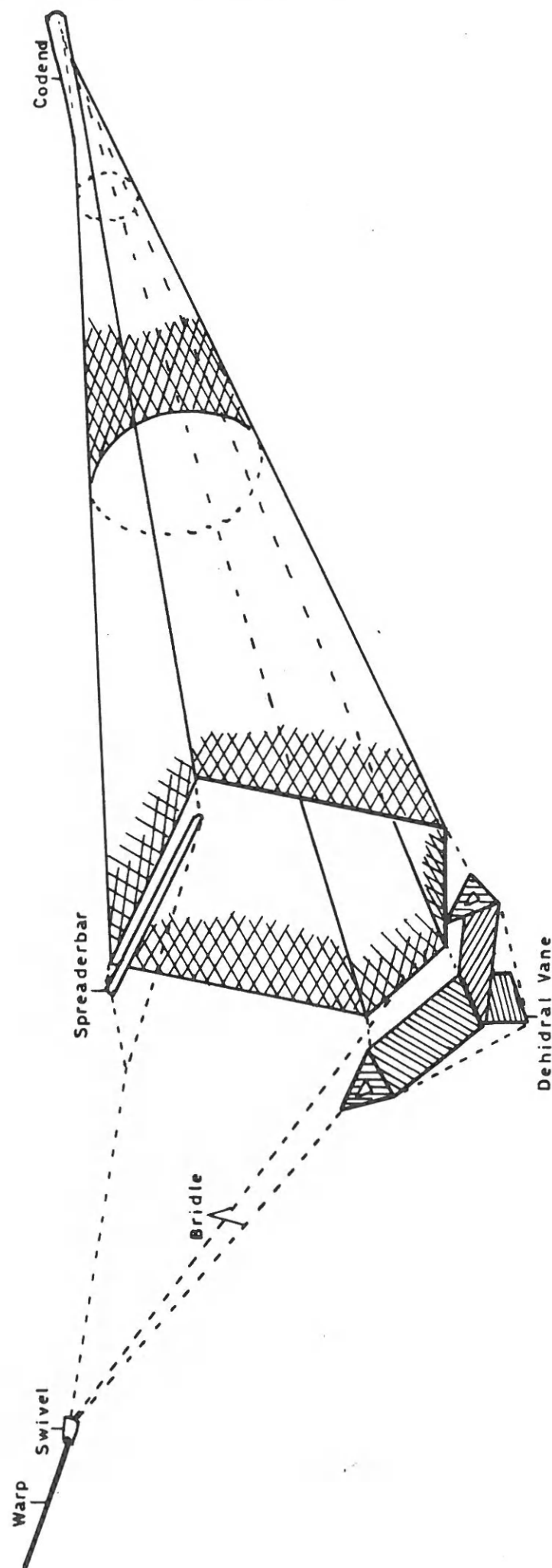
Weather-conditions were up to expectations: not favourably, with wind varying between 1 and 6 BFT and swell between state 1 and 6 (= low short through moderate to high short). Handling the trawl did not cause any trouble, resulting in no time-loss due to failures.

In view of a possible expansion of the survey into the Sargasso Sea, it seems necessary to improve the gear by adding more and better instruments for measuring depth, temperature and speed of waterflow through the net. In addition a cod-end opening/closing device will be necessary.

IJmuiden, September 1972.

Acknowledgements:

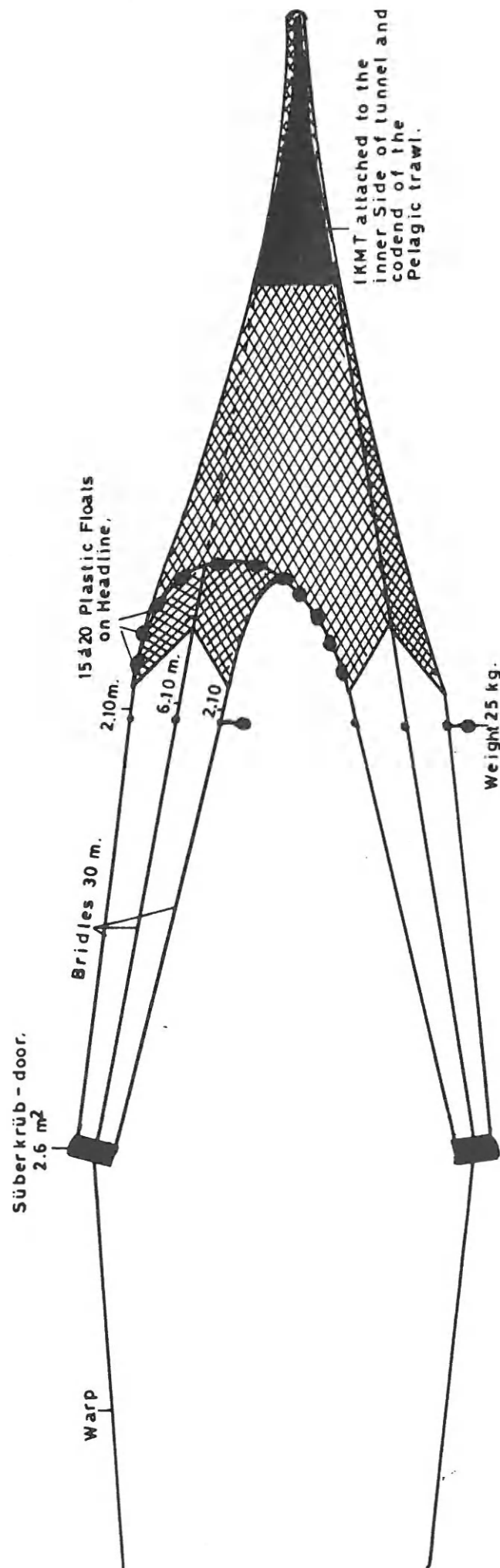
| | | |
|-----------------------|---|---------------------------------------|
| geardesigners | : | P. Korbee, W. Toet, D. Duijndam |
| fieldtrial assistants | : | J. Gielbert, J. van Willigen |
| scientist in charge | : | Dr. C.L. Deelder |
| Skipper | : | A. Krijgsman and crew of the Tridens. |



Schematic View of I.K.M.T.
Original Rig.

R.I.V.O.-IJmuiden

Fig: 1



Pelagic Trawl used as a carrier for the IKMT.

Data pelagic trawl; total length 56.27 m, mesh length at trawl mouth 16 cm, circumference at trawl mouth 492 meshes.

R.I.V.O. IJmuiden.

Fig: 2