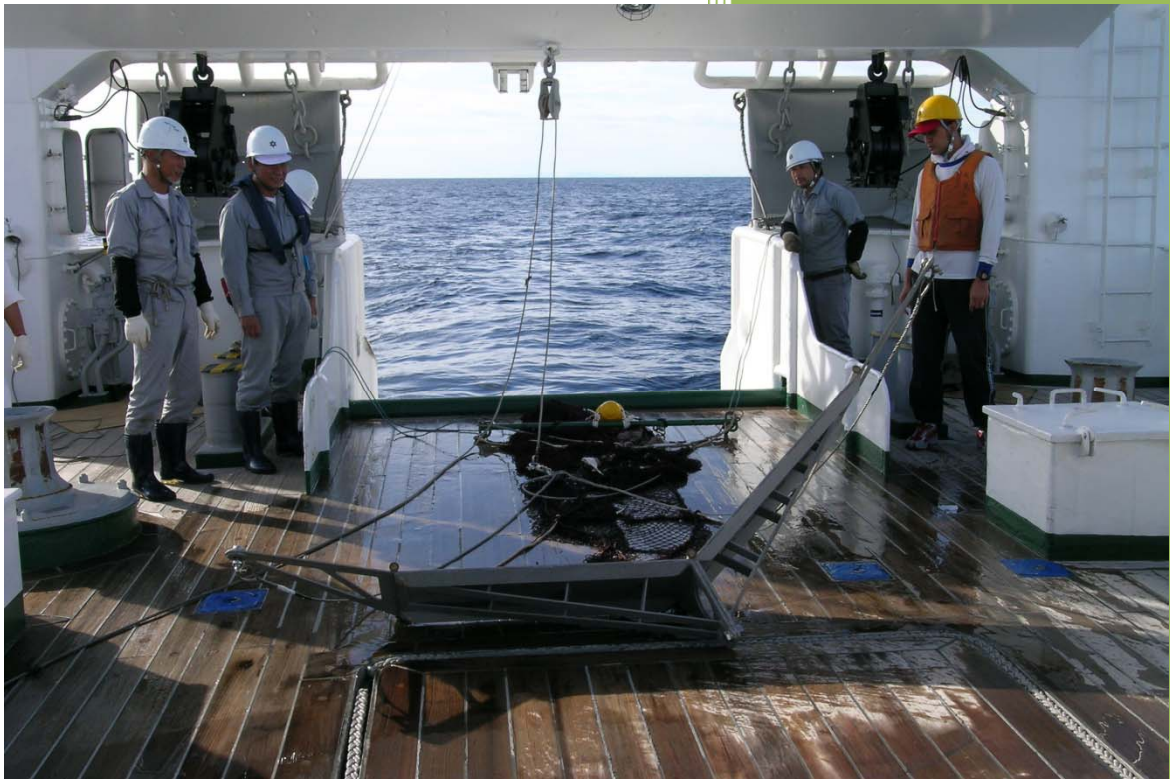# 2007

Standard Operating Procedures of

Isaacs-Kidd Mid-water Trawl

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Introduction

Isaacs-Kidd mid-water trawl (IKMT) is oceanography tool used to collect bathypelagic biological specimens larger than those taken by standard plankton nets. The trawl consists of the specifically designed net attached to a wide, V-shaped, rigid diving vane sometime called a depressor. The vane keeps the mouth of the net open and exerts a depressing force, maintaining the trawl at depth for extended periods at towing speeds up to 5 knots, but the optimum towing speeds should be 2-3 knots because of the high level of drag exerted by the net in the water. The inlet opening is unobstructed by the towing cable.

The IKMT is a long, round net approximately 6.50 m long, with a series of hoops decreasing in size extending from the mouth of the net to the rear (cod) end, which measures an additional 2 m in length. The hoops maintain the shape of the net during towing. The mouth of the net is 1.75 m wide by 1.30 m high, and is attached to a depressor.

The IKMT's largemouth opening and capacity for fast towing speeds enables it to capture a wider range of relatively large and more active organisms than smaller nets. In addition, its fine mesh allows it to snag animals that are not retained in the large trawl nets that are used for commercial fishing. Thus, it is well suited for capturing an array of fishes, squids and shrimp that inhabit the mid-water zone. To make sample collection easier, the IKMT is always used in conjunction with echo-sounders, which provide a target area for the researchers to sample.

Isaacs-Kidd midwater trawl and their Accessories

Design of IKMT net was duplicated from the IKMT of Research vessel namely Tenyo Maru that belongs to Shimonoseki University of Fisheries (SUF), Japan. But the local materials were used instead. The outer net is PA multifilament $\varnothing$ 1 mm, mesh side 75 mm and the inner net is PA multifilament (knotless) $\varnothing$ 0.5 mm, mesh size 16 mm. Codend part used the plankton net mesh size 1 mm and cover with PA multifilament $\varnothing$ 1 mm, mesh side 19 mm net. All bridles are SST wire $\varnothing$ 8 mm. The net spreader is iron $\varnothing$ 35 mm with approximately 1.50 m length. The depressor made from iron plat and all details of IKMT are shown in **Fig1**.

Figure 1 Diagram of the IKMT
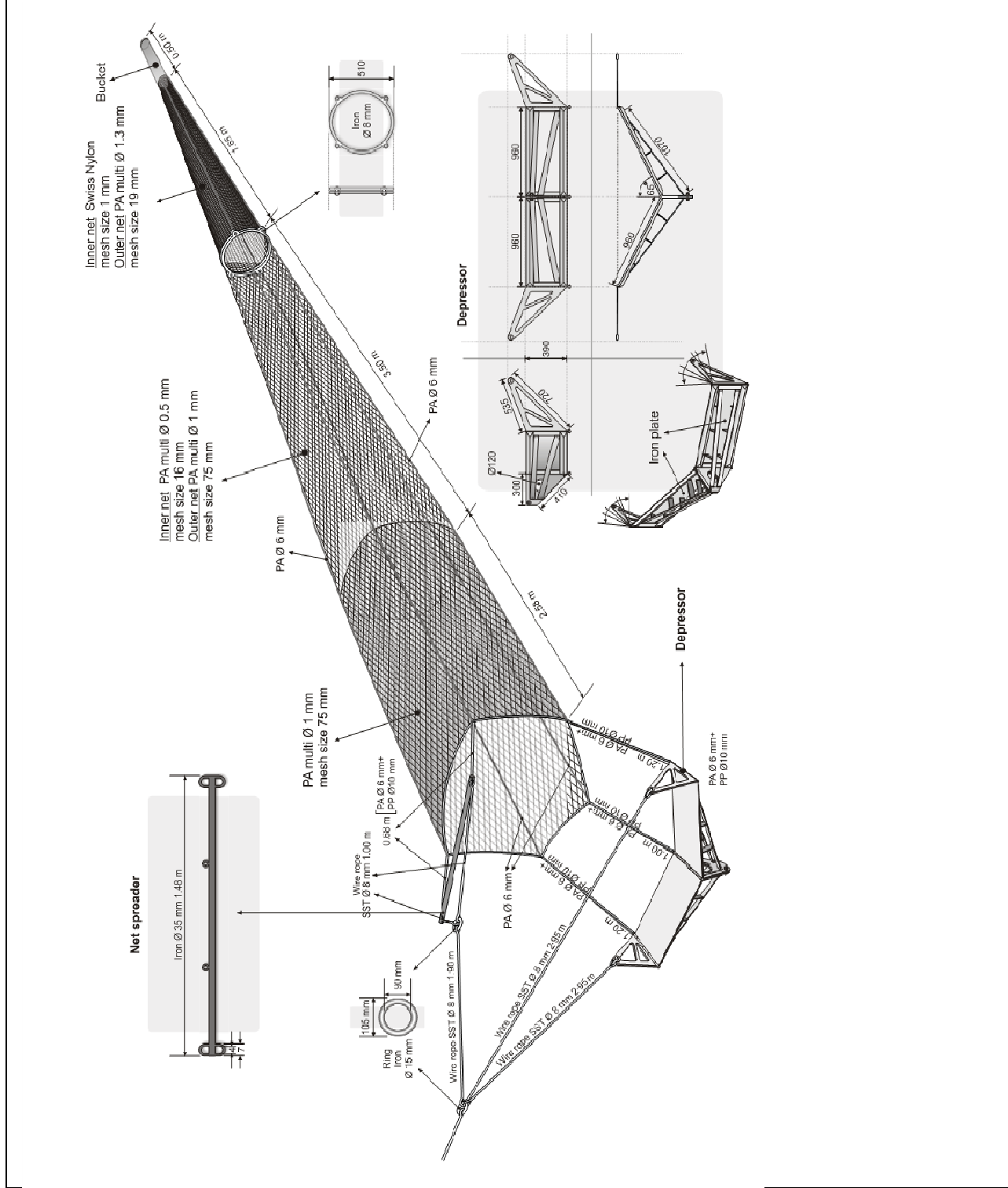
Operation preparation

The IKMT can operate in daytime and nighttime. Before start the operation, the essential information of weather and oceanographic condition are collected, in addition the target area and scattering layer could be detected by the scientific echo-sounder (such as Furuno FQ80, Simrad EK60) before and during the operation (see Fig.2). Thus, all of the acoustic equipments onboard that have the same or nearest frequency of scientific echo-sounder must be turn off to prevent the interference. Figure 3 shows some living organism in the scattering layer.
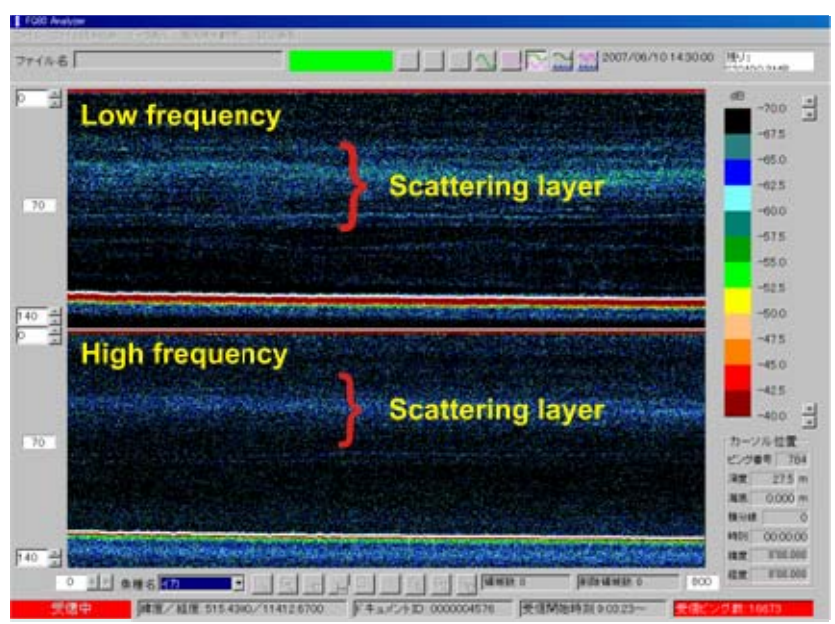

Fig. 2 the scattering layer detected by scientific echo-sounder.

Fig. 3 Active organisms live in scattering layer

Towing time

A half hour is optimum towing time to prevent the sample stuff in the codend.

Number of operation on a mapping grid

The number of operation for resources survey is designed whilst the process of research survey planning. 1 operation or 2 operations or the number of operation on a grid is depended on research activities and designed whilst the process of research survey planning.

Period of trawl operation

Daytime or Daytime and night-time of if daytime and night-time is not any significant condition for survey, period of trawling shall be designed whilst the process of research survey planning.

Depth of operation

The operation depth is according to the scattering layer and can adjust the depth by towing warp.

Towing speed

Optimum towing speed of IKMT should be 2-3 knots. Because of the high level of drag will be exerted by the net in the water.

Towing direction

Towing shall be straight direction and avoid changing towing direction except the towing direction is obstructed by some objects. Record the details of towing direction and time consuming of each direction.

Information recording

The recording of Starting time: start recording the towing time when the IKMT reaches at the target area (If depth sensor: Scanmar or other is fixed at the IKMT) or start recording the towing time when the brake of trawl winch is fastened (If depth sensor: scanmar or other is not fixed at the IKMT).

The recording of Finishing time: recording the fishing of towing time when the IKMT is lifted from the target area (If depth sensor: Scanmar or other is fixed at the IKMT) or recording the finishing towing time when start hauling the trawl warp (If depth sensor: scanmar or other is not fixed at the IKMT).

The recording of operation position: The position shall be recorded by using the GPS (Global Positioning System) or an equally accurate navigation system for position measurement and Position recording by unit of Latitude and Longitude.

The recording of Start operation position: Recording the starting position when IKMT reaches at the target area (If depth sensor: Scanmar or other is fixed at the IKMT) or recording the starting position when the brake of trawl winch is fastened (If depth sensor: scanmar or other is not fixed at the IKMT).

The recording of Finishing operation position: Recording of finishing position when the IKMT is lifted from the target area (If depth sensor: Scanmar or other is fixed at the IKMT) or recording the finishing position when start hauling the trawl warp. (If depth sensor: scanmar or other is not fixed at the IKMT).

Gear malfunction

If the malfunctioning of gear or operation is occurred the operation should be cancelled and re-operate in the same area. Record the malfunction of the gear or operation into the log sheet.

Reference

1. http://access.afsc.noaa.gov/icc/GearDrillDown.cfm?Gearabrv=IKMT
2. http://www.oceanexplorer.noaa.gov/technology/tools/trawl/trawl.html
3. http://content.cdlib.org/xtf/view?docId=kt109nc2cj&chunk.id=ch03&toc.id=d2_1_ch14&brand=eschol&query=0

Making the depressor of the IKMT

Fishing trials of IKMT on MV SEAFDEC2, Deck arrangement.

Fishing trials of IKMT on MV SEAFDEC2, Trawl net part.