

pl

MINISTRY OF AGRICULTURE, FISHERIES AND FOOD
 FISHERIES LABORATORY, LOWESTOFT, SUFFOLK, ENGLAND

1985 RESEARCH VESSEL PROGRAMME

REPORT: RV CLIONE: CRUISE 12

(Provisional: Not to be quoted without prior reference to the author)

STAFF: M H Beach
 E G Shreeve
 N D Pearson
 B F Riches
 B C Mumford
 C Queen (USP, Cork) (4-7 October)

DURATION: 4-11 October

LOCATION: North Sea

- AIMS: 1. Trials of a commercial (USP) acoustic ground discriminator system.
 2. Calibration of 76cm tin tow net (TTN).
 3. Multi-net plankton sampler trials.
 4. Trials with Scanmar commercial net measuring system.
 5. Trials with MAFF prototype trawl net parameter telemetry system.
 6. Tests on portable sonar gear identification system.

NARRATIVE:

RV CLIONE sailed from Lowestoft at 1010h on 4 October and set course for the Inner Silver Pit in the North Sea (about 20 miles east of Saltfleet). This site was chosen to give sufficient water depth (greater than 50m) for the calibration and testing of various gears.

En route to the Inner Silver Pit the acoustic ground discriminator system (USP) was operated and its output compared with the various bottom features displayed on the Furuno colour sounder.

When the Silver Pit was reached and deeper water available, trials commenced with the 76cm TTN. The aim was to assess its dive characteristics with two types of depressor (Standard Scripps or French) and with three weight loadings at its front end. After these tests were completed further trials (cf RV VENTUROUS) on the MAFF multi-net were commenced. This plankton net package was tested in two basic forms: with side depressor blades; and with an under-slung plate depressor. Some 25 deployments were achieved with the dive profile in each case being carefully monitored using sensors to measure depth, warp length/deployment rate, the attitude of the package (roll and pitch) and the status of each of the three nets (open or closed). Variations to the rig included: adjustments to the tail-fin; varying positions of the flow-meter and net-buckets; and attachment or removal of a drogue.

The Scanmar and MAFF net measuring telemetry systems were attached separately to a Granton trawl and deployed in the relatively shallow waters off Mablethorpe (~17m) and in the deeper waters of the Inner Silver Pit (~87m). The aim was to telemeter back to the ship (40kHz acoustic link) the spread of the net wings and the height of the trawl headline. [The Scanmar system is commercially available (cost ~£12,000), whilst the MAFF system is only at the prototype stage of its development: an assessment of, and comparison between, the two systems was required.]

Finally, trials were performed with a portable sonar gear identification system (Incastor) off Mablethorpe. This gear is intended to be used as an inexpensive marker system for valuable underwater packages: an acoustic tag (76kHz) is attached to the underwater package and 'replies' on interrogation from the search vessel. Recent problems with its use required that additional trials be undertaken.

The cruise was completed with good weather conditions throughout and CLIONE docked at Lowestoft at 0730h on 11 October.

RESULTS:

Aim 1 The USP system processes the bottom echo and fish echos and sets index levels (displayed on panel meters) which relate to the bottom hardness and to the number of fish in a pre-set depth band (bottom, surface or midwater). The shape of the bottom echo is used to indicate bottom hardness. During the passage to the Silver Pit and throughout the trawl trials in the Silver Pit and off Mablethorpe, the USP system was monitored and gave an index, both of bottom hardness and fish intensity, which correlated with that seen on the Furuno colour sounder (FCV-110) and with the eventual trawl catch. An exhaustive test was not possible since a detailed knowledge of the sea-bed was not available and the number of fish caught by the trawl very low (not the aim of the trawl).

Aim 2 The 76cm TTN was deployed six times to depths of up to 50m at a tow speed of 5 kts and at a winch speed of 0.3ms^{-1} . The behaviour of the TTN with two types of depressor (standard Scripps or French) and three weight loadings was assessed using sensors to measure depth, warp length/deployment rate and the attitude of the TTN package (roll and pitch). All data was recorded in a log (EGS) or on paper chart for subsequent detailed analysis. Provisional examination of the data suggests that the French depressor (the heavier of the two) and the 2 cwt. nose weight gave the most stable dive profile and the smallest warp length/depth ratio.

Aim 3 Trials with the MAFF multi-net occupied about 25 deployments. The various arrangements of the multinet package that were tried were those that promised to give the greatest dive stability and the lowest warp length/depth ratio. All data was recorded in a log (EGS) or on paper chart for subsequent detailed analysis. Provisional inspection of the data suggests that the under-slung plate depressor gives a more stable dive than the side depressors and has the additional advantage of making deployment far easier and with less risk of damage to the package.

Aim 4 The Scanmar net measuring system telemetry system comprises small, rugged net-mounted units which independently telemeter various parameters back to the ship (acoustic links at separate frequencies around 40kHz). The units are attached to the net as required: a central headline unit to measure height and an index of fish activity; wind-end units to measure net spread; and, a cod-end unit to measure mesh extension (we were not loaned one of these). The ship display unit gives clear unambiguous readings of: transmissions received from the sensors (red lights that flash at 3 second intervals); net spread distance (and an arrow to indicate 'decreasing' or 'increasing'); headline height above the bottom (and an arrow to indicate groundline contact); and, an index (0 to 9) of the number of fish passing under the headline. The system was tested on two separate Granton trawls (at depths of 17m and 87m) with the ship varying its towing speed and executing a 360° turn. The system performed extremely well in all conditions and was subsequently attached to the multi-net package where it gave a height reading which compared well with that given by the depth sensor on the package.

Aim 5 The MAFF trawl net measuring system is at the prototype stage of development (vis-à-vis the commercial Scanmar system) and was tested on a number of trawls. The system comprises a trawl headline-mounted package which contains a microprocessor-controlled unit to measure height above the bottom and the distance between two wing-end mounted units which are connected by cables to the central package. The two measurements are telemetered back to the ship (30kHz acoustic link) and displayed on a paper recorder. Limited success was achieved: the headline height was regularly and reliably telemetered back to the ship but a sensible and regular 'spread' transmission was not received. The main problem was the shape of the transducer units attached to the trawl wing-ends. The use of specially prepared fairings attached by strops to the wing-ends, or direct attachment by lashing to the wing-ends failed to obtain a satisfactory alignment between the two units. If this system is to be developed further (in view of the Scanmar's performance) a similarly rugged unit must be constructed for attachment to each trawl wing-end.

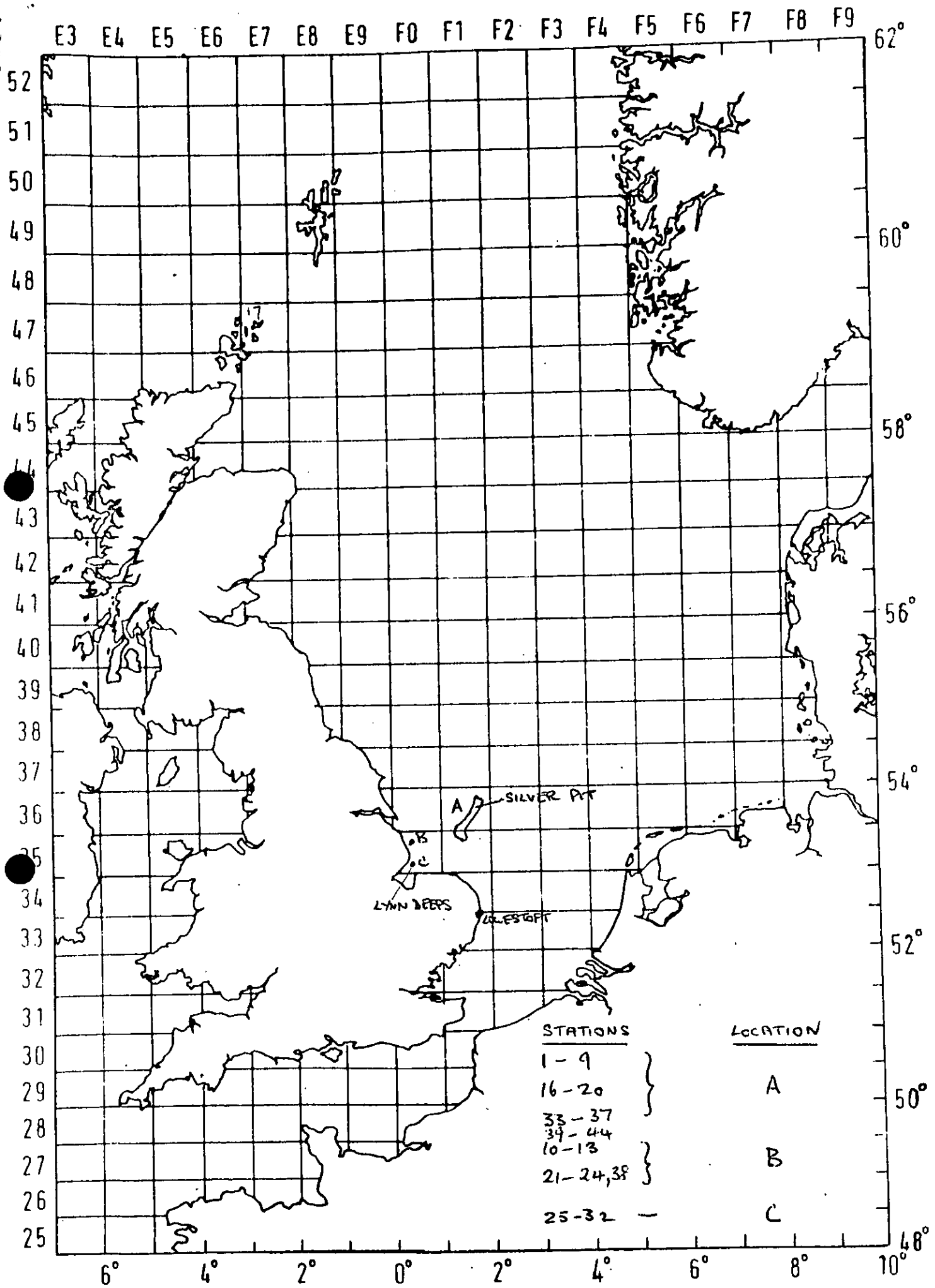
Aim 6 The portable sonar identification gear (Incastor) was tested by mooring a 76kHz transponding acoustic tag in midwater in a water depth of 15m. The ship was allowed to drift away and the transmissions from the tag monitored by the Incastor display and an oscilloscope. The range increased out to about 200m but no return transmission was apparent beyond the closest of ranges (~ 2m) and the trial was aborted pending further electrical and acoustic measurements.

Mike Beach
10 October 1985

Seen in Draft: G Sinclair (Master)
P Mackay (Skipper)

INITIALLED: HWH

DISTRIBUTION: Basic list +
M H Beach
E G Shreeve
N D Pearson
B F Riches
B C Mumford
C Queen (USP, Cork) N B Meyer } Scanmar, Norway
R Wout }



CLIONE 12/85 GEAR TRIALS