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

1979 RESEARCH VESSEL PROGRAMME

REPORT: R V CLIONE: CRUISE 5

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

#### STAFF

R B Mitson  
E G Shreeve 3-5 May  
C R Hood  
N D Pearson 7-16 May  
L Cox  
T J Storeton West 11-16 May  
J C Cook AMTE 5-8 May  
A R Pratt Loughborough University 3-11 May  
G Duck " " 11-16 May

#### DURATION

Left Lowestoft 1330 h on 3 May  
Arrived Lowestoft 2330 h on 16 May

#### LOCALITY

Western English Channel and North Sea

#### AIMS

1. Performance check on transducer stabiliser.
2. Acoustic calibration of scanning sonar
3. Calibration exercise and trials with AUWE (Portland)
4. Telemetry from fish.
5. Acoustic measurements on fish.

#### NARRATIVE

CLIONE headed south from Lowestoft, starting performance trials of the recently overhauled transducer stabiliser on the morning of 4 May. These were complete by mid morning so, with CORELLA nearby, the opportunity was taken to observe the trawl that she was towing. Passage to Portland was then resumed. Mr Shreeve left CLIONE at 0600 h 5 May to Weymouth, the AUWE trials party arrived at 0830 h and the work of detecting and classifying seabed targets commenced. Adjustments were made to the equipment at night, in preparation for the more detailed programme of detection and classification which was carried out on 6 May. The trials party left at 1700 h, after which, CLIONE moved westwards in search of fish whilst the signal digitising equipment was set up. An echo survey through the night failed to reveal any traces so, after reaching the Eddystone, attention was turned to inshore areas. Very few signs of fish were evident and by mid afternoon it was clear that no progress could be made on Aim 5 of the programme in the area.

On 8 May CLIONE returned to Portland, berthing alongside RDV CRYSTAL in order to make detailed measurements of the sector scanner acoustic system. These were complete at 1630 h, by which time Mr Pearson and Mr Essex (1st Officer replacement) had joined, whilst Dr Cook and Mr Oliver (temp. 1st Officer) left the vessel.

Mounts Bay was reached on the morning of 9 May, the overnight echo survey being continued to Lands End. A few small boats were catching mackerel so a number of acoustic signal recordings were made near them, fish samples also being taken by feathering from CLIONE.

On 10 May the weather had deteriorated, with rain and a moderate swell but the midwater trawl was shot in Mounts Bay on the diffuse echo traces found there. Recordings from the scanner were made during the tow, 2 herring were caught. Two further tows produced nil and one mackerel respectively. At night CLIONE anchored off Newlyn to enable measurements and tests on the mini-scanner to proceed. Further trawling took place on 11 May without success, but a number of recordings were made from aggregations of fish and the reference target. At 1830 h CLIONE anchored off Falmouth where staff and equipment were exchanged. On 12 May work started at a deep water anchorage near Falmouth to complete the scanner acoustic measurements and to start the calibration of compass fish tags. The position chosen was ideal for both purposes and, although thick fog hampered the work on 13 May, it was completed by 1800 h when CLIONE started off slowly on an easterly course in poor visibility.

During 14 May an acoustic release unit was anchored in 20 m in order to test the interrogation and reception on a small transducer being towed by the ship. When this was completed CLIONE continued her passage to the east coast. The following morning, final preparations were made for the release of a plaice fitted with a compass telemetry tag. At 1150 h, about 10 m east of Southwold the fish was released and tracking commenced continuing until 1758 h 16 May when the track was abandoned. The signals appeared to be strong after 30 hours interrogation, mostly at a rate of one per second, with some compass now being lost.

## RESULTS

- Aim 1. After the recently completed major overhaul to the transducer stabilisation system it was put through extensive trials. Where direct comparison was possible it was found to be working to its original specification on all functions. No problems were experienced during 158 running hours on the cruise. Some play in the mode gimbal and thrust plate bearing will need to be investigated.
- Aim 2. This was carried out in stages at convenient times during the cruise. The first measurements were made with CLIONE alongside RDV CRYSTAL in Portland harbour, when the source level and beam patterns of the transmitting system were obtained in both planes. They showed a deterioration of about 2dB in level and some distortion of the pattern over previous results. At present the effect on performance is not significant.

A new calibration rig, utilising a remotely placed buoyed hydrophone and pre-amplifier, connected to the ship via the headline transducer cable, laid over the seabed, was very successful. Signals were sufficiently steady to enable a good series of measurements to be taken, confirming the source level measurements at RDV CRYSTAL, but giving a better beam pattern and indicating that some interference effect from the ships' hulls may have affected results at Portland.

Subjectively the sector scanner results were good, seabed signals often being seen out to 340 m, as also was the target sphere. Two 200 mm diameter spheres suspended vertically and placed 1 m apart were clearly visible at 160 m range.

- Aim 3. Good detection and classification of seabed targets were made during the period of trials in Weymouth Bay. These results gave a form of calibration for various sizes and shapes of objects.
- Aim 4. Calibration of the compass telemetry fish tags was achieved by using the ship's boat from which a tag, attached to a pole was lowered and rotated. Interrogation of the tag was by the CLIONE sector scanner, tag response being relayed by UHF radio to the boat where comparison was made with the compass on board. One of the tags was fitted to a 45 cm plaice, which was released about 10 miles east of Southwold. It gave clear unambiguous signals which showed the heading of the fish at any instant of interrogation. The fish did not travel far during the 30 h of tracking but responded to each change of tide. Continuous data were recorded over the 30 h period, which require detailed analysis.
- Aim 5. Recordings were made in various locations around Lands End and in Mounts Bay. Several of these were possible in an area where small boats were catching small mackerel. Attempts to capture representative samples of other fish concentrations by means of CLIONE's midwater trawl were not successful.

#### MISCELLANEOUS

1. A display scan converter recently developed by Loughborough University was attached to the sector scanner during the latter part of the cruise. This unit gave a flicker free daylight viewing display which greatly facilitated the use of the scanner, in particular, a remote monitor on the bridge was easily viewed by day or night and proved to be of assistance to the ship's officers.
2. Trials of the mini-scanning sonar receiver, transducer and transmitter were very successful. Targets could be seen to a distance of 300 m with unexpected clarity.
3. A new, small, towed transducer for the acoustic release system was tested against the hull mounted unit. It gave superior results on reception but was less effective for transmission.

SEEN IN DRAFT

JRF (Master)  
GFL (Fishing Skipper)

R B Mitson  
24 May 1979

INITIALLED

AJL

DISTRIBUTION

Basic List

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