

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

1992 RESEARCH VESSEL PROGRAMME

REPORT: RV CORYSTES: CRUISE 12

STAFF: G P Arnold (SIC 22 October-2 November)
J Brown (SIC 20-22 October: 20-27 October)
J D Metcalfe (27 October-2 November)
J W Read (20-21 October)
B H Holford (21 October-2 November)
B F Riches
A A Buckley
M O Eagle

DURATION: Left Lowestoft 1450 h GMT 20 October 1992
Docked Lowestoft 0130 h GMT 2 November 1992

LOCALITY: Southern Bight

AIMS:

1. To track plaice fitted with transponding acoustic tags and simultaneously measure the speed and direction of the tidal stream with an acoustic Doppler current profiler (ADCP).
2. To compare measurements made by the ADCP with measurements made by recording current meters and DRCM's.
3. To test and use pressure sensitive telemetry tags as part of the Data Storage Tag development programme.
4. To collect live plaice for the Data Storage Tag development programme.

NARRATIVE:

CORYSTES sailed on the afternoon tide of 20 October and proceeded to position 52° 21.75' N 02° 56'E to lay the first of two current meter rigs. The current meters were laid by 1710 h and the ship dodged in the immediate vicinity of the rig for the next 10.5 h, making continuous measurements of the speed and direction of the tidal stream for subsequent comparison with the current meter measurements. She then steamed to position 52° 00.8'N 01° 52.31'E to lay the second current meter rig, following a zig zag course along the way to acquire calibration data for the ADCP. The second current meter rig was laid by 0810 h 21 October and CORYSTES then returned to Lowestoft to exchange J Read for B Holford, as planned. The ship sailed again immediately and at 1920 h began working a 14-hour anchor station alongside the northern current meter rig to acquire further data for aim 2 of the programme. The following day was spent testing pressure tags at a variety of ranges and depths and investigating acoustic interaction

between the sector scanner and the ADCP. CORYSTES then returned to Lowestoft to collect a new set of brushes for the vertical gyro generator, which was inoperative, and to allow G Arnold to join the ship. The vessel docked at 1500 h 22 October and sailed again on the same tide.

Fish tracking commenced at 0855 h the next morning, when a plaice fitted with a long-life acoustic tag was released at a position midway between the two current meter rigs. Tracking continued until 0400 h 27 October when the third fish was abandoned and CORYSTES set course for Lowestoft to exchange J Metcalfe for J Brown and collect a second deck tank. After sailing again at 0945 h, CORYSTES steamed to Smiths Knoll and completed two short tows with a Granton trawl before rapidly deteriorating weather conditions forced her to seek shelter in Dunwich Bay, where trawling continued until 1500 h 28 October. Further tag trials were carried out during the afternoon, and again the next morning, prior to the release of a fourth plaice, which was fitted with a pressure sensitive tag. This fish was released at 1350 h but was lost two hours later when the transponding circuit of the tag failed, after an extended period of multiple firing. Following this failure, the rest of the day was spent testing the performance of the remaining pressure tags, paying particular attention to multiple triggering of the transponder circuit.

A fifth plaice fitted with a long-life transponding tag was released at 0930 h 30 October and followed until 0850 h, 1 November. The fish was then abandoned and CORYSTES spent the rest of the morning attempting to recover the northern current meter rig. But this proved impossible in the prevailing sea conditions and with a forecast of force 9 southerly winds the ship returned to Lowestoft.

RESULTS:

1. Four plaice (fish 1, 2, 3 & 5) fitted with long-life acoustic tags were followed for periods of 11, 8, 42 and 47 hours. Measurements of the speed and direction of the tidal stream were made with the ADCP for long periods during the midwater excursions of the tracks of plaice 3 (Fig 1) and 5 (Fig 2) and for more limited periods when the fish were on the sea bed. At times acoustic interference on the sonar made it difficult to follow the fish and the ADCP was then switched off to avoid losing the tag signal. The interference appeared to be attributable to the narrow band transmission of the ADCP and is expected to be substantially reduced when the manufacturer supplies the broad band instrument that was actually ordered. The ADCP, which itself appeared unaffected by the sector scanning sonar, triggered some of the long-life acoustic tags at short ranges (<90 m).
2. Continuous measurements of tidal stream speed and direction were made for 10.5 h, while the ship maintained station alongside the northern current meter rig, and for a further 10 h, while the ship was anchored alongside the same rig.
3. The telemetry circuit of the pressure sensitive tags worked very well indeed, giving confidence in the equivalent part of the Data Storage Tag, which makes use of the same pressure sensor. There remains, however, a problem with the transponding circuit, which is prone to continuous triggering, and which will preclude the use of any telemetry tags until it is overcome.
4. Fishing was very poor but eight large live plaice were returned to the laboratory.

ACKNOWLEDGEMENT:

Our thanks are due to the ship's navigating officers and helmsmen, who continued to track the fish with their usual skill and dedication, despite significant interference on the sonar display from the ADCP signal. Their difficulties were compounded by a persistent problem with the digital readout from the sector scanner tilt-azimuth display unit, which would 'freeze' intermittently at critical moments.

G P Arnold
2 November 1992

SEEN IN DRAFT: M J Willcock (Master)
R Graham (Senior Fishing Mate)

INITIALED:

A handwritten signature, possibly 'G P Arnold', is written in black ink. Below the signature, the date '6/4/92' is written in a similar cursive style.

DISTRIBUTION:

Basic list +
G P Arnold
J Brown
J Metcalfe
J W Read
B H Holford
B F Riches
A A Buckley
M O Eagle
M H Beach
T J Storeton West
Clerk, Eastern Sea Fisheries Committee.

FIGURE CAPTIONS:

Figure 1. The track of plaice 3 (L = 42 cm), which swam through the water at an average speed of approximately 10 cm/s (0.2 L/s) in a south-easterly direction, whilst being carried north and south over the ground by the tidal streams.

Figure 2. The track of plaice 5 (L = 38 cm), which moved into midwater on the first north-going tide but subsequently changed its behaviour, remaining on the sea bed for 20 h before moving into midwater again at night and swimming through the water in a west-north-westerly direction at an average speed of approximately 30 cm/s (0.8 L/s).

6-1

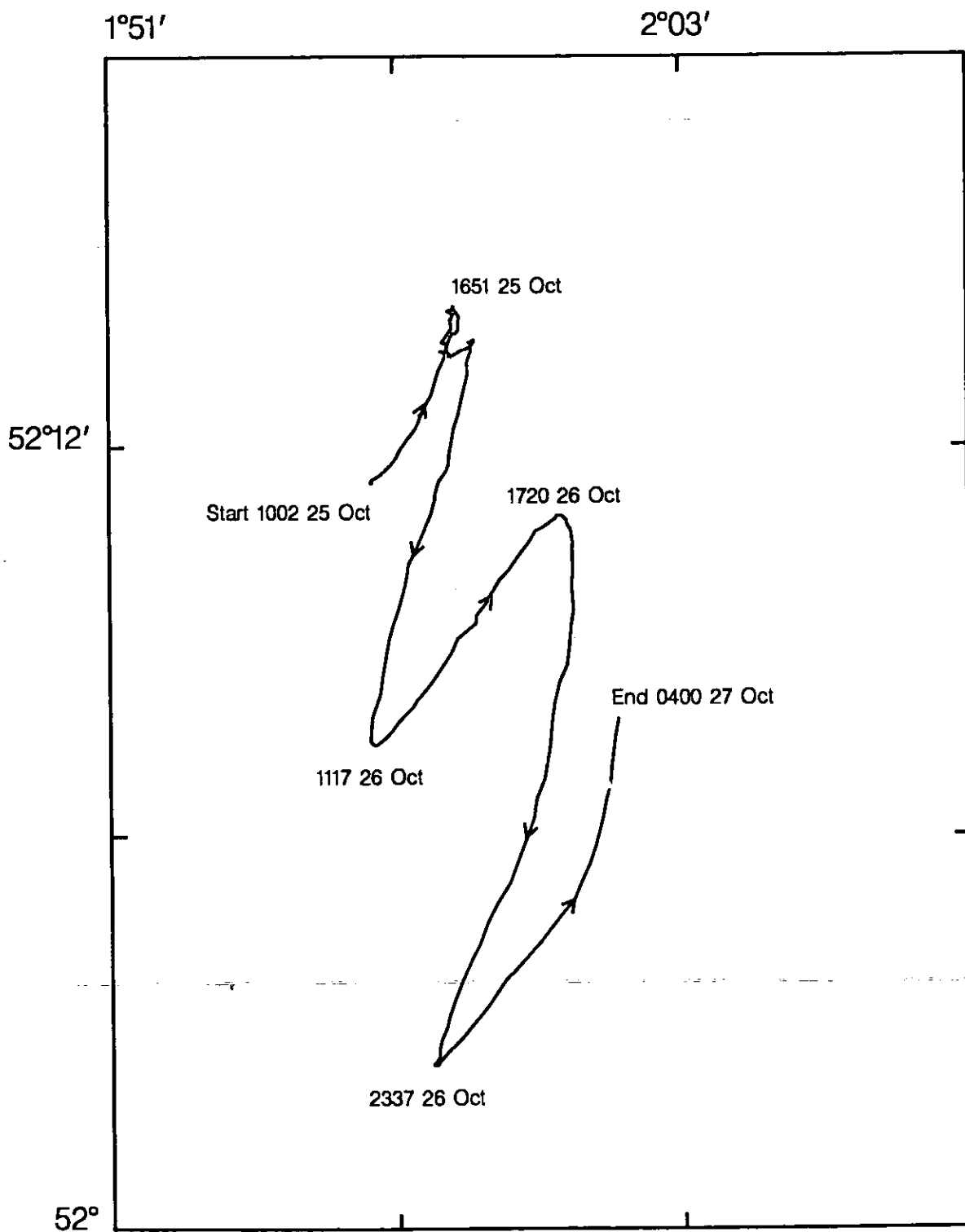


FIGURE 1

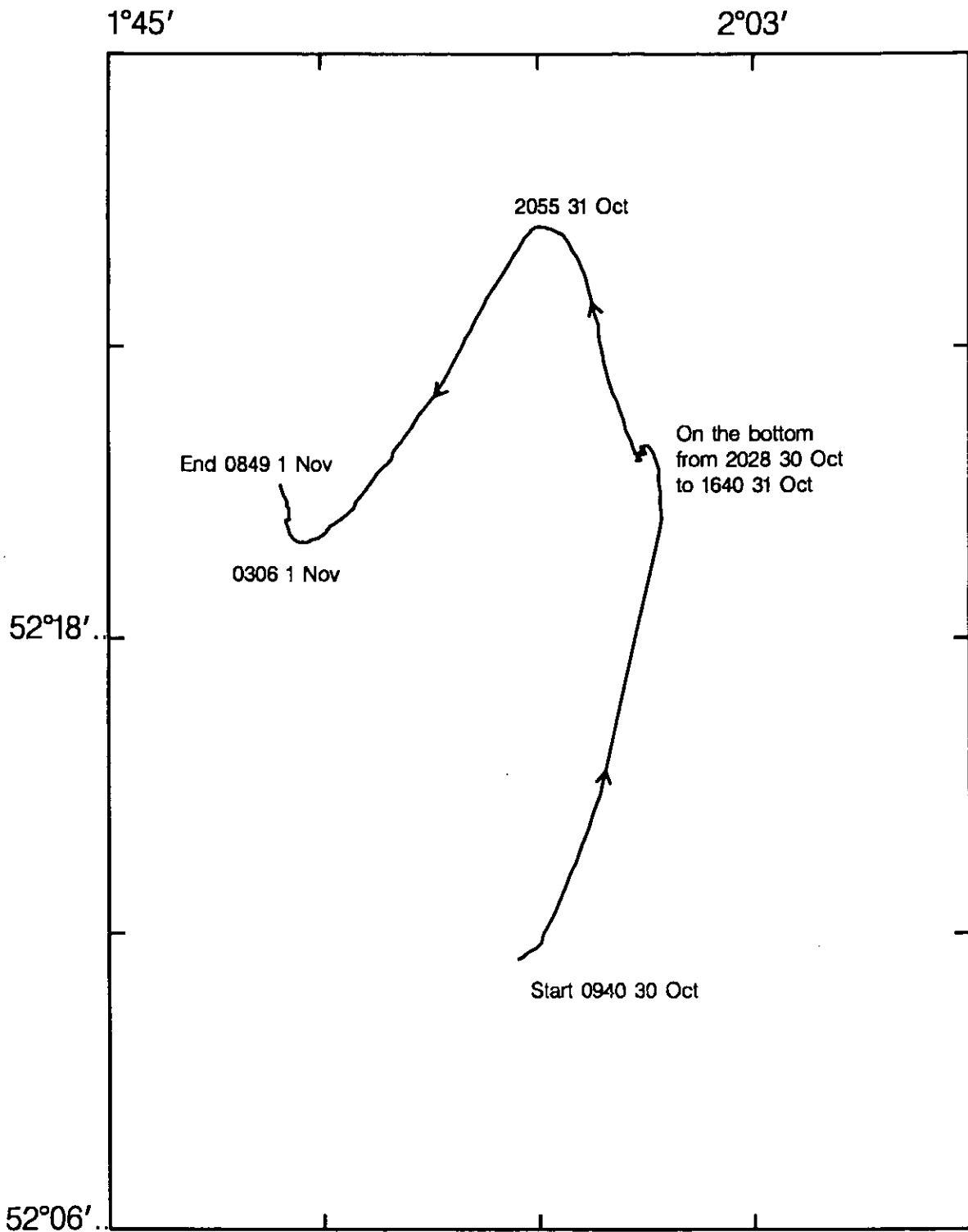


FIGURE 2