Track chart with ROSCOP form

Report of Proceedings

RRS Shackleton Cruise 1/74 leg 1. 8 - 29 May

Original plans called for an effort on passage to get apparatus required in the Eastern Med. for legs 1, 3 and 4 working and to carry out a detailed c. s. p. grid survey and a variable-angle sonobuoy seismic experiment SE of Crete at 33°35'N, 28°45'E. At a later stage of planning we undertook to shoot a two-ship variable angle seismic experiment with the French (I. F. P.) ship R/V Florence off the coast of Algeria at 37°40'N, 4-5°E. Planning the passage at 200 miles per day left 6 working days for these three experiments.

Bad weather and the necessity of landing two members of the catering department caused us to arrive 36 hours late at Gibraltar so I cancelled the experiment with the French. On passage we tested the profiling system, checked that the explosive on board (aquaflex) could be fired ($8\frac{1}{2}$ successes in 10 shots), and made three trial lays of four Cambridge sonobuoys. These revealed a serious malfunction. We arrived at the area SE of Crete, as scheduled, at noon 23rd, and spent three days making the c. s. p. survey, a grid of tracks 24 miles long and $2\frac{1}{2}$ miles apart navigating by radar on a moored transponder buoy whose position was checked by satellite fixes. At the end of this we made a fourth trial lay of the sonobuoys but the results were not encouraging so we spent the night using disposable sonobuoys to determine seismic velocities and the remaining 24 hours of working time in profiling round three sides of Mt Eratosthenes, south of Cyprus. The fourth side will be profiled at the start of leg 3. We thus achieved only two out of the four objectives of this leg.

The Cambridge profiling systems and the Cambridge and RVB Bolt airguns worked well. Initially we had difficulty connecting up the array because of a worn 64 pin plug and a spare which also proved to be faulty. The sonobuoy system was unchanged from previous years except that the replay unit had been completely redesigned. We had on board two new boxes of Scotch 3M 1800 ft spools of triple play $\frac{1}{4}$ inch magnetic tape identical, so far as we knew, to tape used for several years past. After the first trial lay we discovered that this new tape was running in jerks through the modified Uher decks. We solved this and persuaded the system to work on an oscillator signal in the lab. but it refused to work in the buoys. We expect to have this problem solved before JOHN MURRAY 12/74.

Measurements with an accelerometer system revealed the source of the excessive vibrations that ruined measurements of gravity with the Cambridge Askania GSS-2 aboard Shackleton in 1972: the vibrations of the steel deck under the platform are at a reasonably low level but they are amplified by the relatively flimsy wooden floor which rests on the deck and further amplified by resonance in the platform. The resulting vibration is at a level of about 2 g in the sensitive band about 30 hz.

RVB equipment gave some trouble. The Barringer magnetometer would not cycle when first switched on and this was traced to a loose board in the magnetometer power supply. Subsequently it would cycle but produced only a square wave, 25 V p to p, in place of the precession signal. Attempts to find the source of this oscillation were handicapped by the late discovery that

after initial switch-on the polarising relay is energised, disconnecting the bottle from the magnetometer, until the 'manual' button is pushed (tho' the transistor switch is off so no polarising current flows)/. In the end the problem was solved by plugging the magnetometer into stabilised instead of unstabilised A. C. mains. The behaviour was reproducable tho' there appeared to be nothing wrong with the unstabilised supply viewed on an oscilloscope. This trouble lost us all magnetic observations until just before we reached Gibraltar. I recommend that the how-to-do-it book be amended to describe the waveforms that should appear at all four test points on the front of the magnetometer when the instrument is working correctly. (Only one is mentioned).. In the Mediterranean the magnetometer chart recorder paper drive collapsed as it so often does and we had to record on a Cambridge Servoscribe recorder, sacrificing a record of the ship's speed. The satellite navigator had difficulty reading its instructions from the teleprinter and difficulty locking-on the low channel (temperature sensitive board) and the crystal clock in the lab. jumped repeatedly to the distraction of time-marks on other records; Ken Robertson knows about these problems. I recommend the installation of a reliable clockwork clock in the laboratory. The radar transponder buoy gave comfortable ranges to more than 15 miles. The e/m log speed and the Bergen Nautic log distance run were calibrated on runs across the measured mile off Malta: both were reduced by 5% as a result.

The ships' officers and crew continue to be the friendliest and most competent with whom I have worked. The engine room officers maintained the array winch diesel and the compressors in excellent order. The scientists' cabins are greatly improved.

I recommend that, in addition to the things under equipment:

1. You try replacing the wooden drum on the after capstan by a similar one with flat, not curved, cheeks to see if it would stop putting turns into the magnetomer cable when recovering the fish.

2. The ship should have several portable cable trays permanently on board. They should be 6 ft x 8 ft x 1 ft (minimum) with a slatted base. They are not for lifting cables on a crane but for keeping them out from under peoples feet.

3. The chart drawers in the laboratory should be replaced by drawers big enough to hold a British Admiralty 1:1,000,000 plotting sheet, the standard sheet on which soundings are submitted to the HO and the IHB The sheets are 3'6" x 2'6", larger when copied. /Our drawers here measure 3'9½" x 2'9½" x 1½"/.

4. Further consideration needs to be given to the fairlead arrangements onto the drum for the hydrophone array. Perhaps Peter Barker and I could consult.

These are all minor. The one major recommendation follows:

Someone in the Office will have to keep an eye open for navigational hazard warnings that should be passed to Scientists planning cruises. Although NAVEAMS had been promulgated several months ago I knew nothing until we got there of the existence of a declared war zone in the Eastern Med. extending