

# A MINIATURIZED SYSTEM FOR LONG TERM RECORDING OF TEMPERATURE MICROSTRUCTURE FROM ANCHORED BUOYS HAVING AN ACCURACY OF MEASUREMENT OF THE ORDER OF $0,01^{\circ}\text{C}$

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## SUMMARY

The system consist of a number of sensors physically and electrically connected with the mooring cable of a submerged instrumented buoy. The temperatures are recorded intermittently inside the buoy on a low speed 2 channels tape recorder having up to one month life. They appear in terms of time duration between electrical pulses.

These pulses can also be telemetered via FM radio from a light surface buoy to an attending ship 5 to 10 miles away.

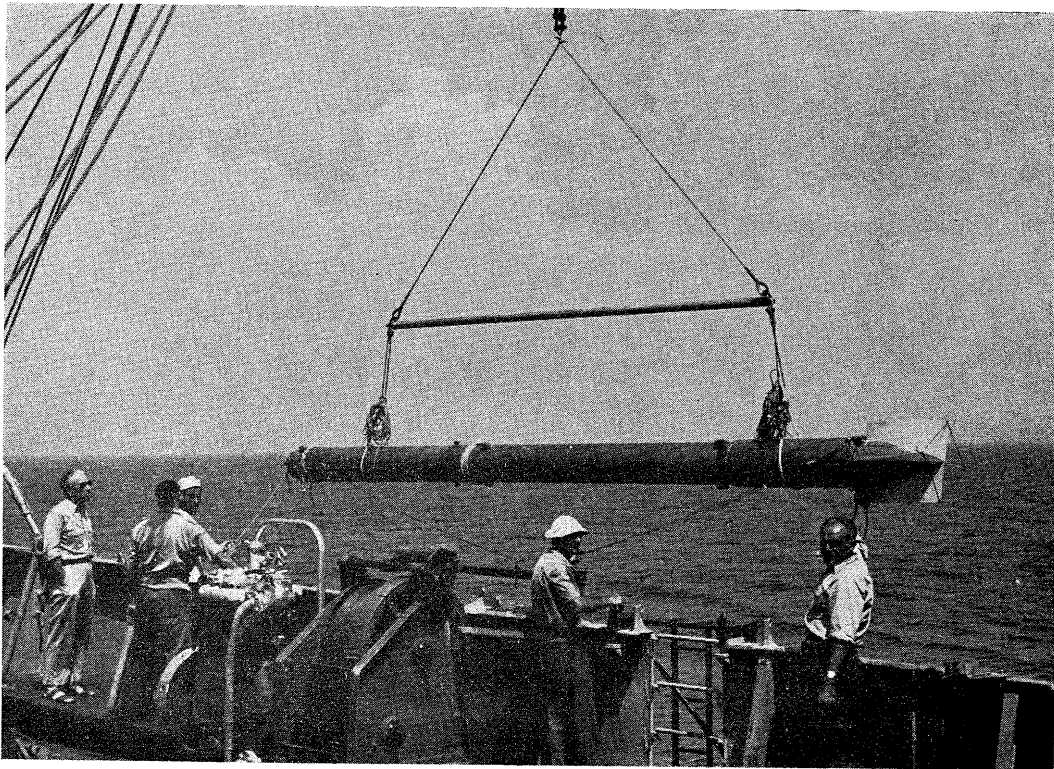


FIG. — The recoverable submerged instrumented buoy is torpedo-shaped to minimize drag. It consists of two sealed tubes mechanically connected in series and an openable container of instruments. Its total length is 5 meters, diameter 27 cm, total buoyancy 120 kg, weight in air 150 kg, including wooden ogives (nose and tail).

On the play back system the information from each thermistor, electronically corrected is stored in counters and subsequently on a punched tape wich in turn is fed to an electronic computer for analysis.

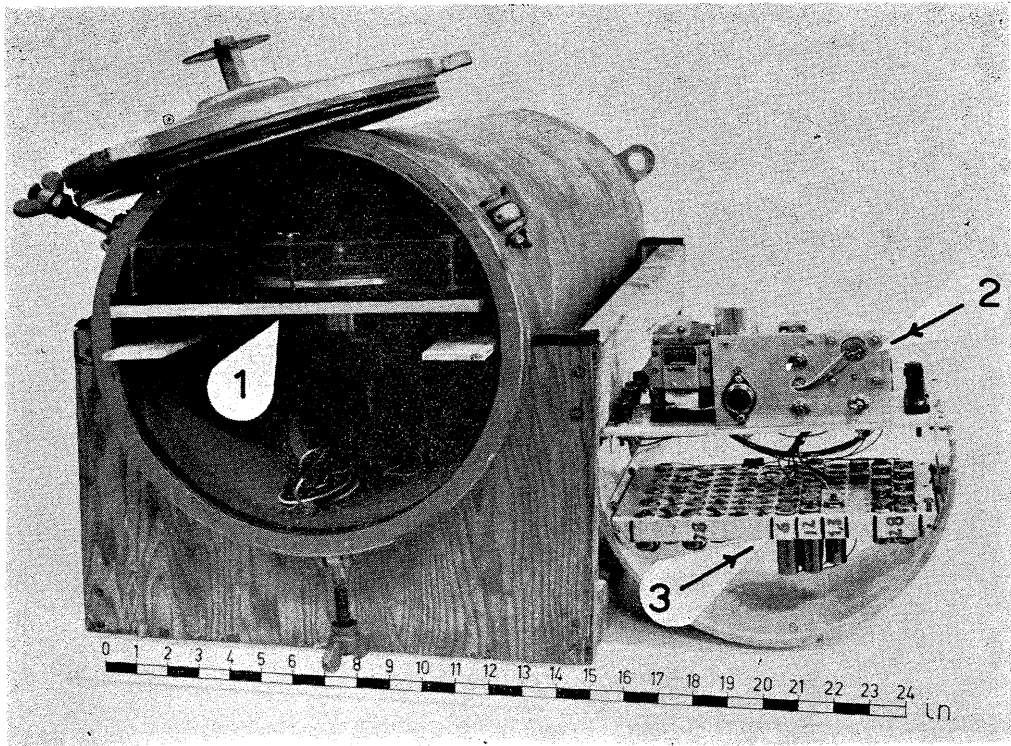


FIG. 2. — (1) Low-speed two-channel magnetic tape recorder, (2) electronic timer and (3) power supply (mercury batteries), contained in the cylindrical container of the buoy shown in fig. 1.

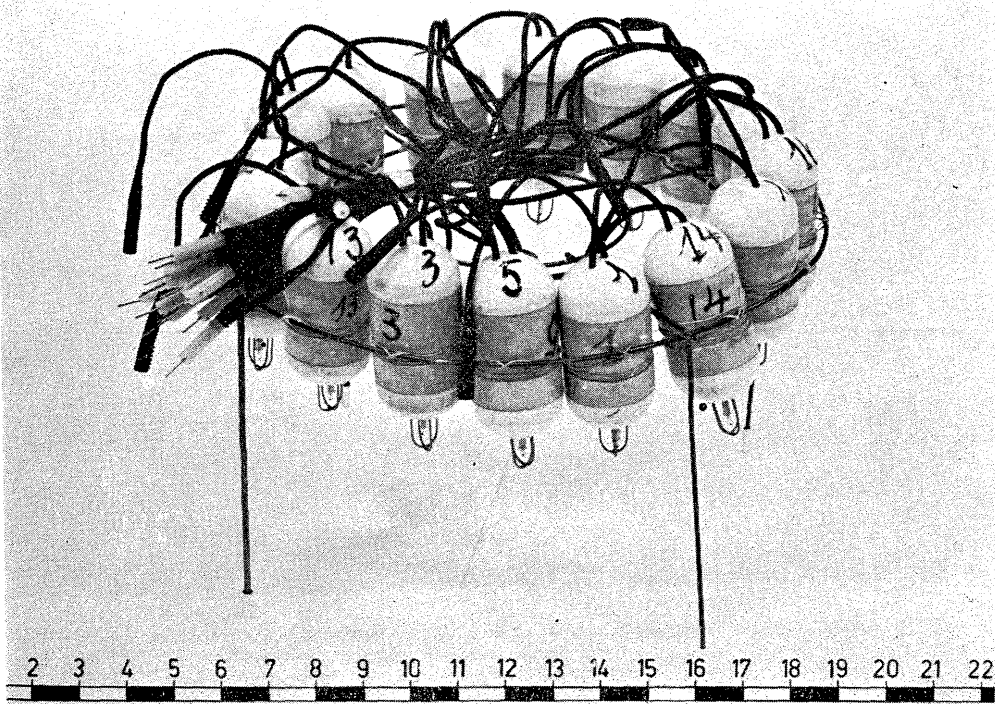


FIG. 3. — Thermal sensors (thermistors and circuits molded in Araldite) arranged in a grid for calibration in Fisher isotemp bath. The sensors are physically and electrically connected to the mooring cable by means of the black wire and watertight connectors seen in this figure. The scale is in inches.

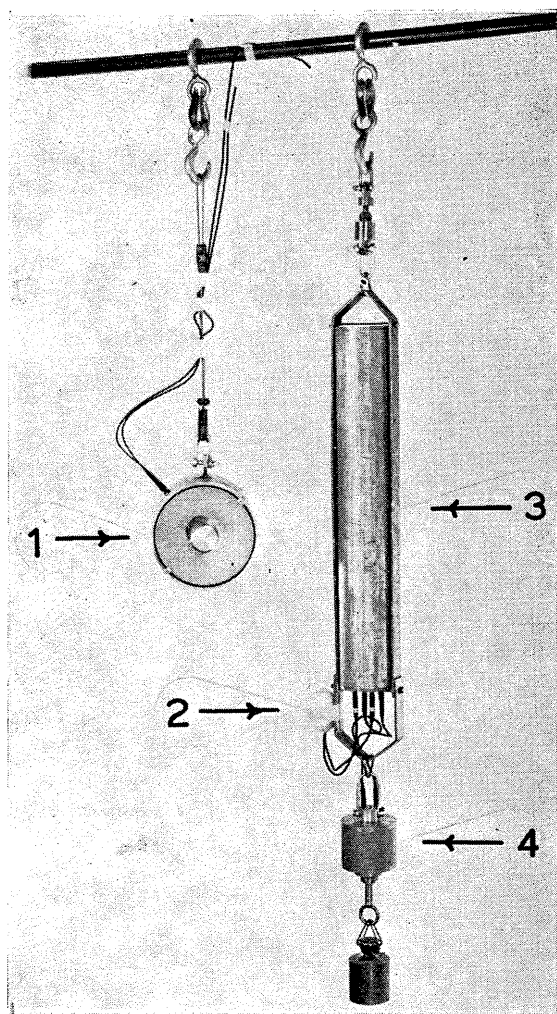


FIG. 4. — Acoustic anchor-release system for recovery of the instrumented buoy and probes. (1) Is the shipborne 1400 cps, 400-Acoustic Watt sound source, (2) a minus-100 db sensitive hydrophone, (3) a receiver including amplifiers and filters arranged to exclude false triggering by ship noise and (4) the mechanical releaser. Only upon receiving a 20-second narrow band signal will the releaser operate.

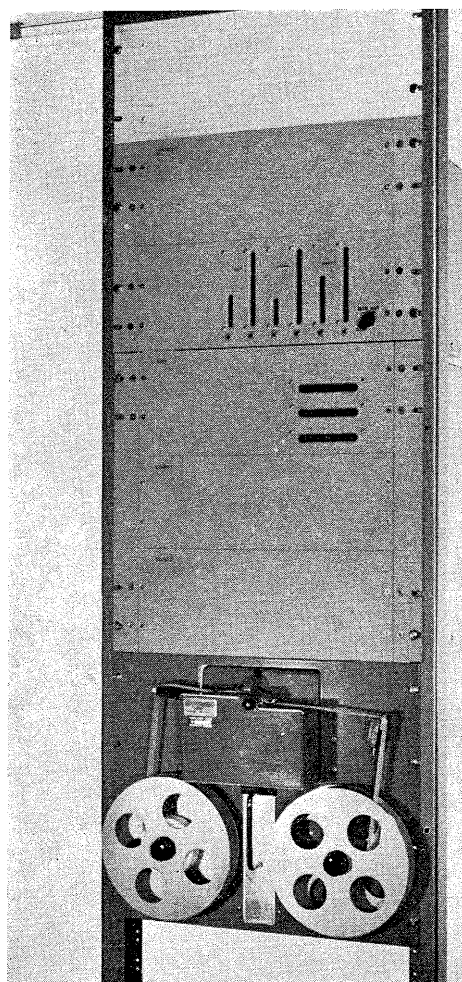


FIG. 5. — The modular, solid state digital recorder of the system for direct recording of FM radio transmitted signals from the buoy or for playback from magnetic tape of the buoy. Pulse signals are counted, stored and printed on the punch tape.

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