

OCEANOGRAPHIC DATA BUOY

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INTRODUCTION

During the last 10 years interest in air-sea interaction and, in particular, in understanding the response of the upper layers of the ocean to the atmosphere, has increased markedly. Growing interest in coastal processes on the part of geophysical community has increased. Mesoscale research in this areas has been severely impeded by the expense and complexity of measurement systems available for use in the coastal zones, where wind conditions are generally quite different from those at beach/land sites, and where a concentration of commercial traffic and pollution occur. This talk describes a small oceanographic data buoy currently under development in the institute.

BUOY DESCRIPTION

The schematic diagram of the buoy is given in fig.1. A spherical hull made from aluminium and filled with polyurethane foam with diameter approximately 1m. A 0.38m i.d. cylinder penetrates the hull and extends approximately 0.50m below the sphere bottom. Electronics and gel-cells brace in air-tight cylinder in freon gas to prevent condensation is provided. The sensors stand 2m above the water surface. Wind speed is measured with RRM young model 6101 popeller, and relative wind direction with a vane assembly, and buoy orientation with a flux-gate compass which is located in the electronics unit. Air, sea-surface and in-house buoy temperatures are measured with thermistors. The wave-height sensor is Hippy (Datawell) model with a maximum capacity of +10m range. The detailed parameters are listed as in Fig.2.

The anchoring mechanism consists of: a float-line connecting the buoy to a secondary float. The float-line is nylon with thick plastic coating and having foam floats attached every 2m. The line attaches just below the buoy equator, at its center of drag: producing minimum tilting torque when the line is in tension. The combination floats reduce probability of entanglement, and the recovery/replacement can be easily done by disconnecting the float-line at the secondary float: Fig 3.

The complete block diagram of the system as detailed in Fig 4 will be explained during the course of the talk.

Encl: Fig.1-4

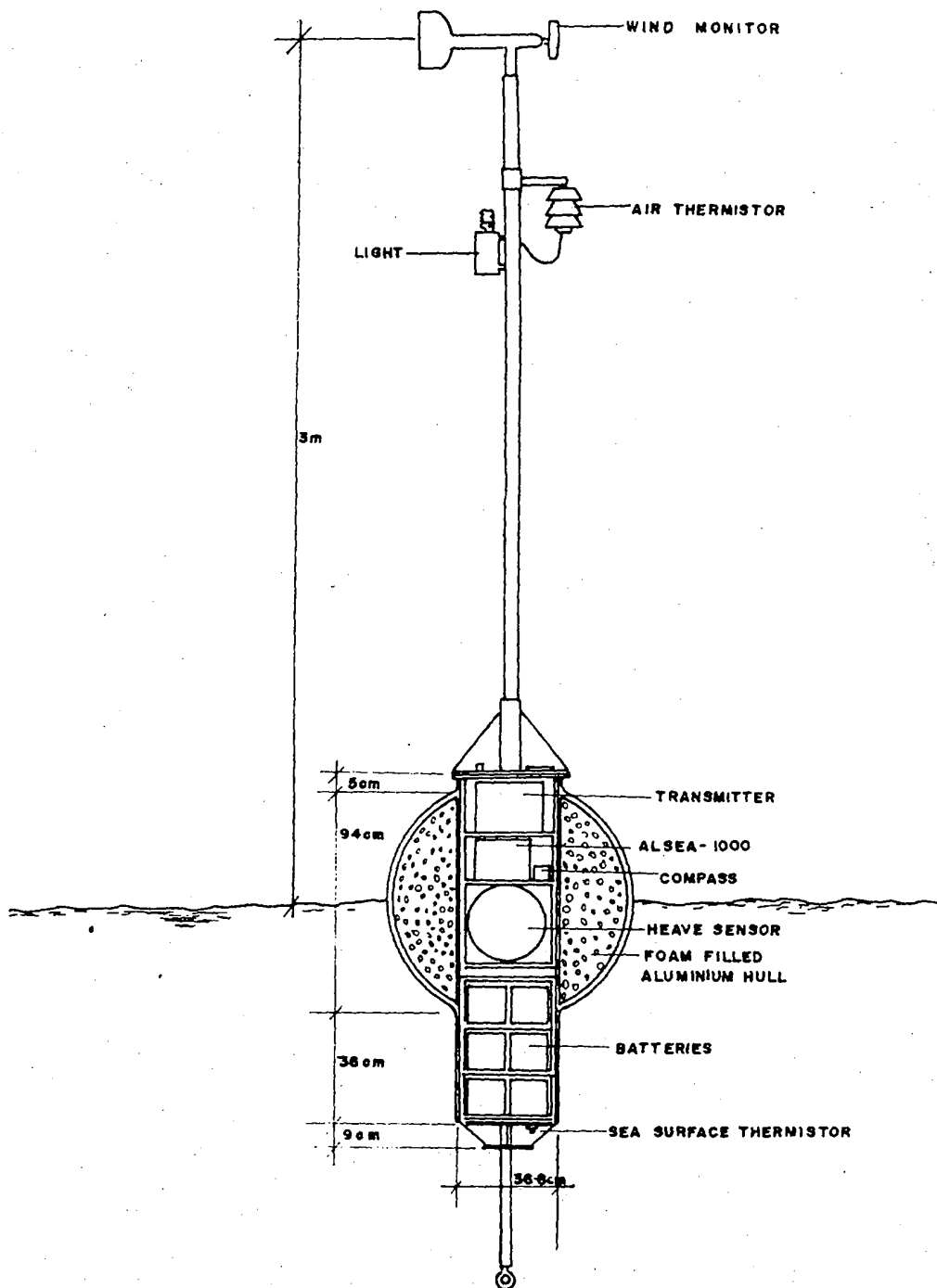


Fig. 1 OCEAN DATA BUOY

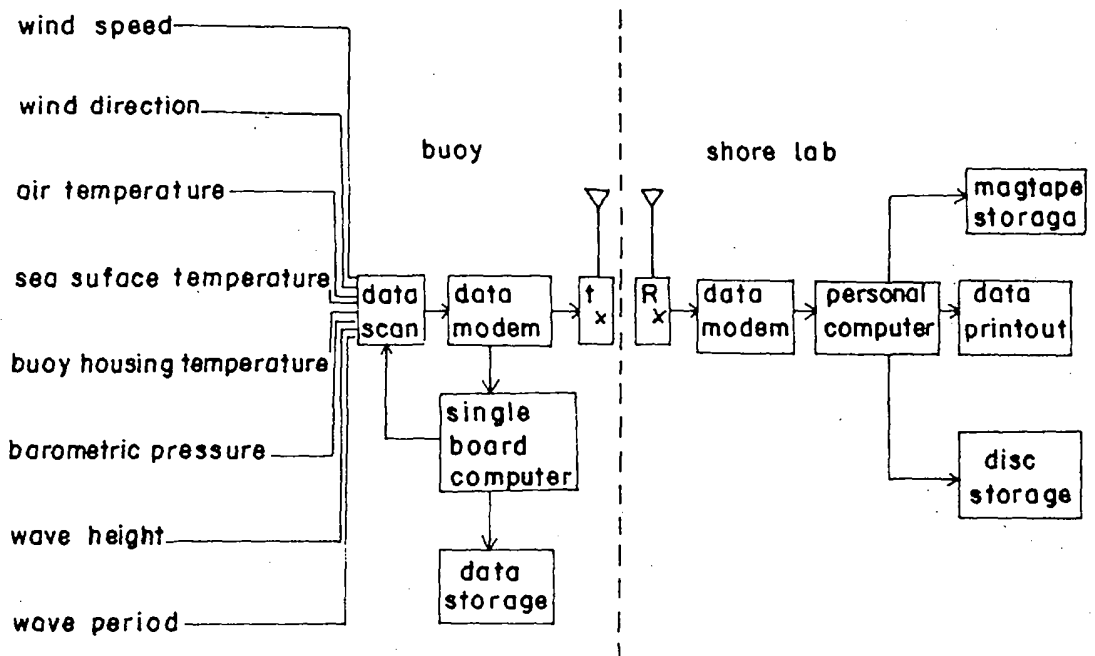
Wave recording ocean data buoy

tentative
specification

range

wind speed	0 - 60m/s
wind direction	0 - 360 deg
air temperature	10 - 40° C
sea surface temperature	10 - 40° C
buoy housing temperature	10 - 40° C
barometric pressure	920- 1080 mb
wave height	10m.
wave period	3 - 30 sec.

block schematic



TYPICAL INSTRUMENT DEVELOPMENT PATH:

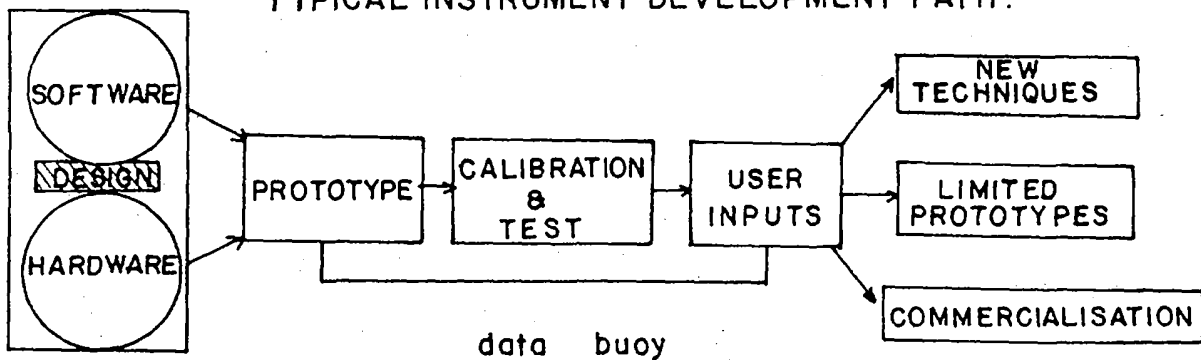


Fig.2

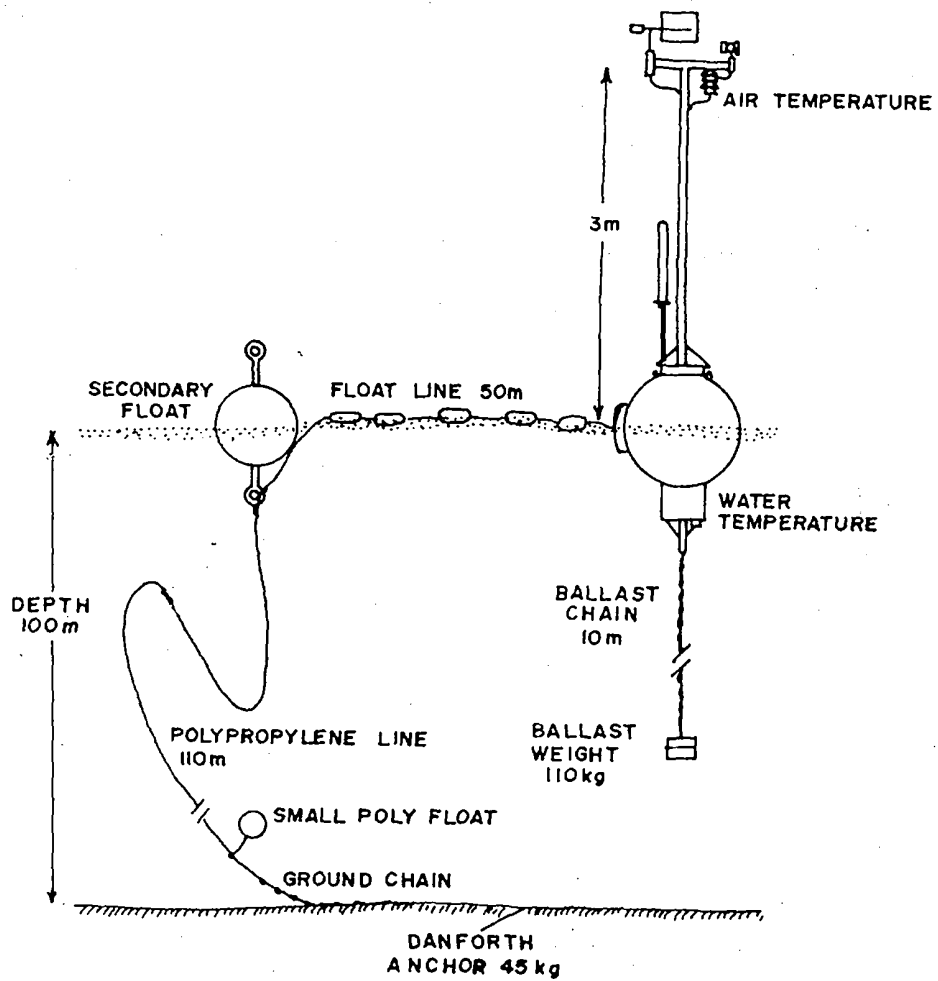
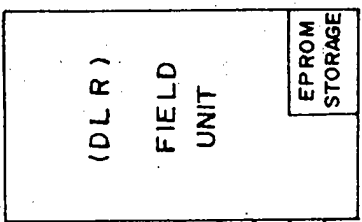


Fig. 3 The ballast and mooring configuration for the buoy. A nominal depth of 100m is shown here

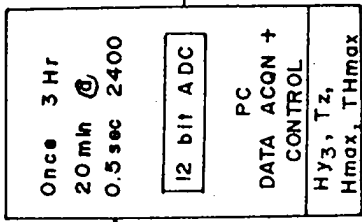
- SAT (ARGOS)
- VHF

BUOY

- WIND SPD
- WIND DIRECTION
- AIR TEMP
- BAR. PRESSURE
- BUOY TEMP
- S.S.T.
- BUOY HDG
- RT C
- BATT VOLTAGE



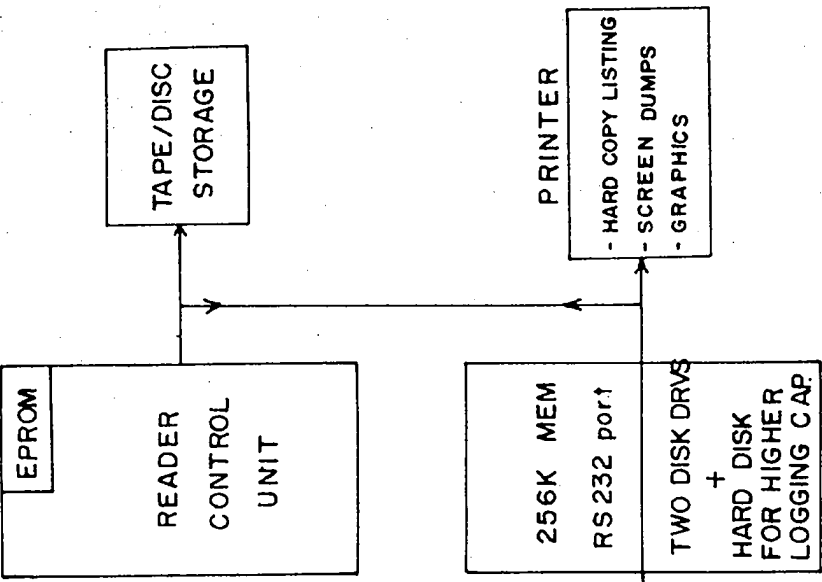
SIGNAL CONDITIONING
+
SENSOR INTERFACE



WAVE (HEAVE)

Tx

SHORE LAB



POWER SUPPLIES
CONTROL + DISTBN.
(FOR ALL UNITS + FLASH
LIGHT)

SEALED LEAD ACID BATTs

AUTOMATED SYSTEM BLOCK DIAGRAM

Fig. 4