

Letter to the Editor

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MINIATURE THERMOGRAPH

A small, accurate miniature thermograph for recording temperature to a precision of 0.5°C in the range $+50^{\circ}\text{C}$ to -10°C over a period of about 12 hours is described. The instrument was specially designed to record air temperature inside a metal gondola used for cosmic rays measurement by the Tata Institute of Fundamental Research, in their high altitude balloon flights from Hyderabad. The main requirements were that the instrument be small, light and rugged and be capable of recording temperature for periods upto 12 hours with a precision of 0.5°C .

Description — The miniature recorder consists of a bimetal coil which serves as the temperature sensor, a clock drive assembly for the chart which can run for 12 hours and a metal stylus which records the temperature on a waxed paper chart.

Fig. 2 shows the thermograph ready for use. The sensitive bimetal element is fixed on a detachable perspex disc and has a sharp stylus which scribes on the waxed chart disc. The chart disc is firmly held on the metal disc by a knurled knob which is driven by a clock work mounted below the perforated cover. The clock is an ordinary time piece or an alarm clock, converted to give a revolution of the metal disc in 12 hours by suitable changes in the pinion and gear assembly at the last stage. The clock work is carefully rated and corrected and generally does not exceed ± 2.3 minutes/day. An aluminium cover protects the clock work from dust. Three hooks are provided on the perforated cover to enable the instrument to be suspended, if required.

Methods of setting the thermograph — Fig. 1 shows the exploded view of the thermograph and its parts. The retainer ring is removed from the notch by pressing the projecting ends together and pulling the ring out. The chart can be removed by unscrewing the central knurled nut. A new chart can now be fixed on the metal disc irrespective of the position of chart. The perspex sheet with the bimetal sensor and stylus is then lowered on the

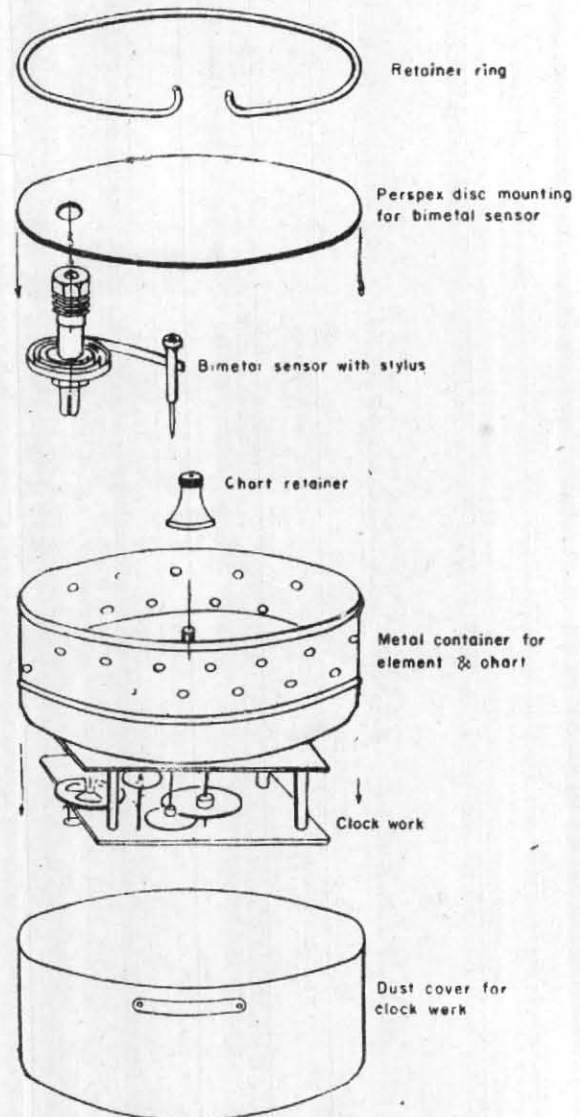


Fig. 1

Exploded view of the Mini-thermograph

disc so that stylus touches the time scale of the chart at the present time. The retainer ring is fixed without moving the perspex sheet. After the time of the thermograph is set, set the stylus to record correct temperature as read on a mercury

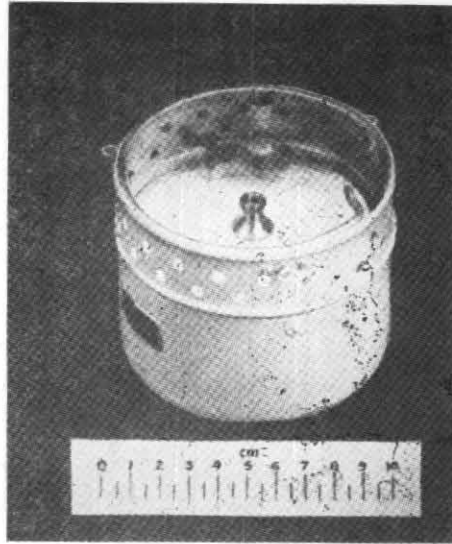


Fig. 2

Mini-thermograph ready for use

thermometer loosening the hexagonal nut on the top of the perspex sheet and with a screw driver rotate the control screw to the required position as read on the chart and lock it by tightening the

hexagonal nut. The thermograph is ready for recording the ambient temperature between $+50^{\circ}\text{C}$ and -10°C . The readings are accurate within $\pm 0.5^{\circ}\text{C}$.

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