

## Letters to the Editor

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### A NULL DETECTOR FOR PYRHELIOMETER OBSERVATIONS

1. An indigenous electronic galvanometer has been constructed in the Central Radiation Laboratory, Poona to replace imported 'Norma' Galvanometers for pyrheliometric (compensation type) observations. The galvanometer is used to compare the equality of temperature of the two similar strips in the pyrheliometer. The strips are in thermal contact with a thermocouple, whose output is sensed by the galvanometer.

2. Two operational amplifiers  $\mu A 741C$  manufactured by Electronics Corporation of India are used as d. c. amplifiers to amplify the output of the thermocouple. The amplifiers are connected in cascade and the amplification of each stage is kept low to minimise drift. The output of the amplifier is fed to a 0 to 50  $\mu A$  d. c. microammeter through a filter and bridge. The filter, the bridge and the condenser across the meter are used to reduce drift and improve stability. The variable resistor in the first amplifier is present whereas the one in the second amplifier is brought out as an adjustable control to set the deflection of the meter with no input in the

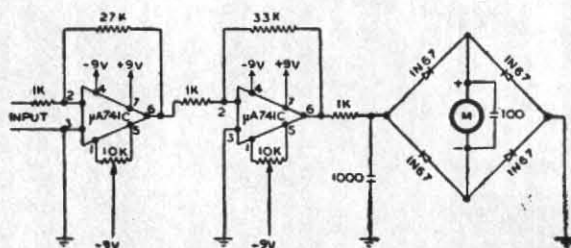


Fig. 1. Electronic galvanometer

middle of the scale. With an input voltage, there is a deflection on the meter which depends on the polarity and magnitude of the input.

3. The accuracy has been tested by using this instrument and Norma Galvanometer as null detector alternately on a clear day for pyrheliometer observations. The heating currents taken by the pyrheliometer measured on a precision milliammeter was agreeing.

No drift was observed in the instrument after initial setting during a pyrheliometer observation period of 3-5 minutes or standardisation period of 10-15 minutes. Even if small drift is present it is automatically compensated as the strip getting heated in the pyrheliometer is interchanged alternately.