

## A COMBINED EVENT AND FIXED-TIME RECORDER

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### ABSTRACT

A flexible general-purpose recorder which is based on a standard printing counter and a battery-wound clock is described. Totals accumulated in the counter are printed on a roll of paper on command. Recording of rainfall, solar radiation and wind run are possible applications.

### INTRODUCTION

A new low-cost recorder based on a Swiss printing counter mechanism has been developed. It allows events, such as rainfall, solar radiation, etc., to be recorded:

- (a) by printing time on a paper tape when an event of predetermined magnitude occurs; or
- (b) by printing the total number of events at predetermined time intervals.

A single switch is operated to change from mode (a) to mode (b).

### DISCUSSION

The recorder is designed to be of maximum use in investigations where the user requires quick access to the data, e.g. for the purpose of extracting daily totals, peak intensities, etc. The user also decides the form of recording, i.e. event or fixed time.

The event mode could be used for recording where relatively short periods of activity are separated by longer periods of inactivity or where the activity is not high. This applies particularly in the case of rainfall recording.

The fixed-time mode could be used where the high activity occurs almost continuously yet a condensed record is required. An integrator with a pulse rate proportional to solar radiation intensity and an average rate of 100 pulses per day will obviously produce a shorter record if recording is in the fixed-time mode at one print-out per hour.

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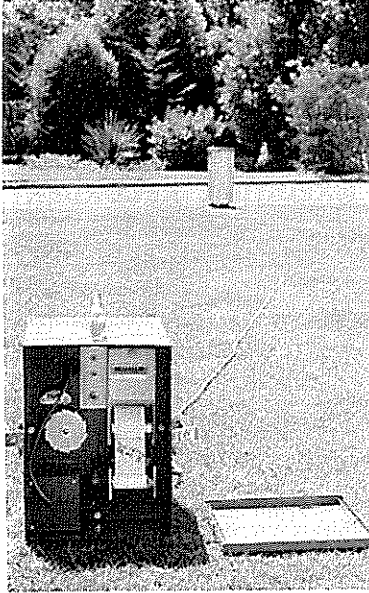


FIG. 1—Prototype recorder under test.



FIG. 2—Sodeco PL103 printing counter.

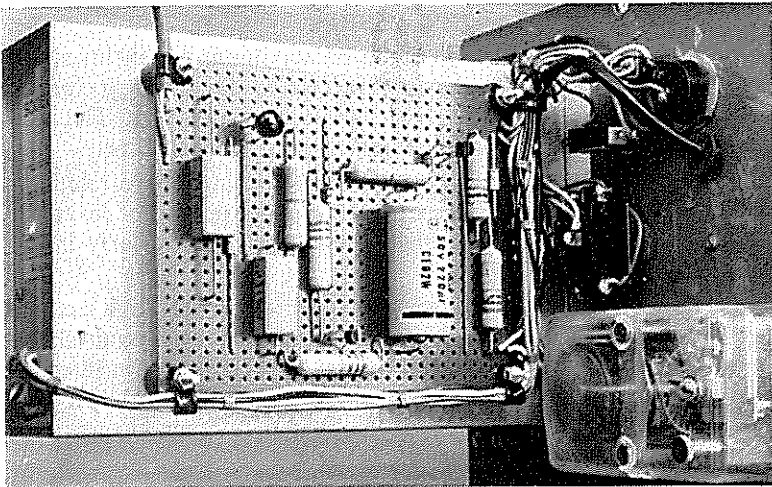


FIG. 3—View behind front panel of counter, circuit, switches and clock.

Existing event recorders (Chandler and Patterson, 1970) produce short records which can be processed automatically by a computer. If this feature is not required, then the printing recorder becomes attractive, as the record is not encoded and is therefore easy to read.

It is estimated that a printing recorder can be made for half the cost of existing event recorders, and this ratio is expected to be preserved in spite of the rising cost of instrumentation in general.

The recorder (Fig. 1) is a single compact unit with its own internal battery power supply. It is about half the size of existing event recorders and weighs 9 kg complete with batteries.

To accommodate the tape produced, a simple take-up mechanism is employed. The tape is long enough for 10 000 impressions; servicing and tape replacement could, therefore, be carried out at the same time. A plastic tape is being investigated as a possible alternative to paper. The inking system is soundly designed and should not give trouble.

The recorder consists basically of:

- (a) A standard Sodeco PL103 printing counter (Fig. 2).
- (b) A standard Ergas timer with a selection of timing cams.
- (c) A battery box for standard D-size cells (manganese-alkaline cells are recommended, although torch cells work well).
- (d) A simple electronic circuit controlling the counter, printer, timer motor, and the take-up mechanism.
- (e) Two push buttons, two plugs and one switch.

All of these are mounted in a suitable weather-proof metal box.

Because standard mass-produced components are used, costs are low. Nevertheless, all items are well made and should be reliable.

## THE CIRCUIT

The circuit provides control of the resetting, counting and printing coils, the timer and the take-up mechanism (Fig. 3). When the change-over switch is in one position, the event activates the printing coil and the clock activates the counting coil; in the other position the roles are reversed. The take-up mechanism is activated only when the printing coil is on. A lock-out device can be provided to prevent counting and printing at the same time, but as this is a remote possibility (approximately 1 in 3600 at a six-minute interval) it is unnecessary in many applications. The addition of an integrator to this circuit would allow solar radiation totals to be recorded.

## CONCLUSION

The tape printer employed is a versatile mechanism available as single and multichannel units, and it has considerable potential as a reliable low-cost basic recording unit for hydrological and meteorological investigations. Applications outside these fields (e.g. industrial counting) are attractive, mainly because of the fast counting and printing action.

## ACKNOWLEDGMENTS

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## REFERENCE

- Chandler, A.; Patterson, J. E. 1970: Digital event recorders for representative and experimental basins. In: *Proceedings of the Symposium on the Results of Research on Representative and Experimental Basins, Wellington, 1970*. IASH Publication No. 96. pp. 700-707.