

RAIN ALARM

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In this circuit, a Darlington transistor pair amplifies the small current passing through drops of water falling on a sensor and sounds an alarm. The circuit is shown in Fig. 1. Power is supplied by a standard 9V battery.

When a drop of rain bridges the sensor vanes, which are adjacent strips on a piece of stripboard, a small current flows between the connecting wires. This current flows through R1 and the base-emitter junction of TR1. A much bigger current, about 200 times, flows through the collector-emitter circuit of TR1. This current comes from the base-emitter junction of TR2, turning it on and sounding the buzzer. R1 is included to limit the current out of TR1 in case of a short circuit.

When transistors are wired in this manner (Darlington pair), the current gain

of the circuit is equal to the gain of the two transistors multiplied together (current gain is the ratio of collector current to base current). In this circuit, current gain is about 4000 times, so only a fraction of the buzzer's small current will flow through the sensor.

The Sensor

All that is required is to wire a piece of stripboard a few tracks deep and a few holes wide (size isn't critical) so that alternate strips may be connected together. The wiring is done with small wire links on the topside of the board.

PARTS LIST

R1: 1M, **TR1:** ZTX300, 2N39094, etc., **TR2:** TIP31A or other plastic NPN power transistor, **B1:** 9V battery, **S1:** miniature toggle switch, **WD1:** 6 to 9V buzzer.

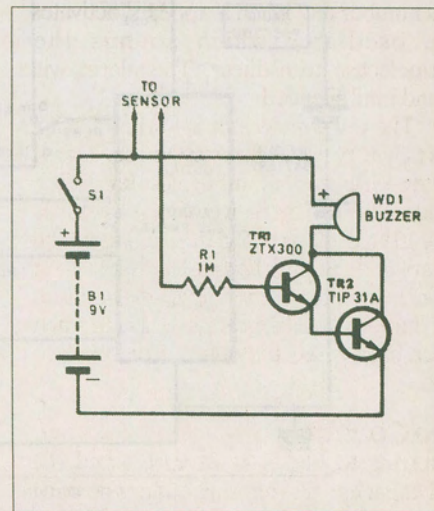


Fig. 1. Circuit diagram of the Rain Alarm.