

NON-CONTACT POWER MONITOR

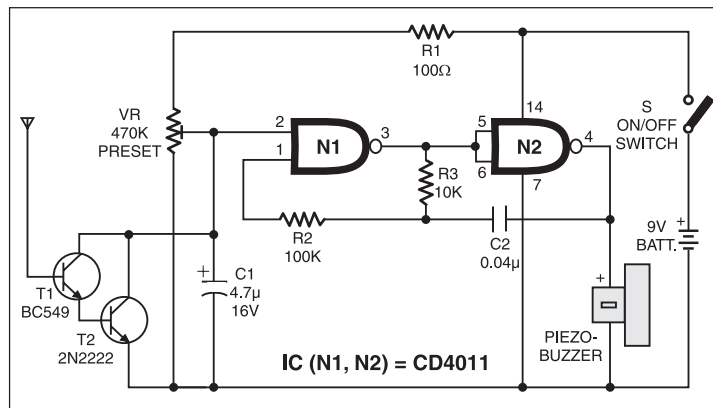


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Here is a simple non-contact AC power monitor for home appliances and laboratory equipment that should remain continuously switched-on. A fuse failure or power breakdown in the equipment going unnoticed may cause irreparable loss. The monitor sounds an alarm on detecting power failure to the equipment.

The circuit is built around CMOS IC CD4011 utilising only a few components. NAND gates N1 and N2 of the IC are wired as an oscillator that drives a piezobuzzer directly. Resistors R2 and R3 and capacitor C2 are the oscillator components. The amplifier comprising transistors T1 and T2 disables the oscillator when mains power is available.

In the standby mode, the base of T1 picks up 50Hz mains hum during the positive half cycles of AC and T1 conducts. This provides base current to T2 and it also conducts, pulling the collector to ground potential.



As the collectors of T1 and T2 are connected to pin 2 of NAND gate N1 of the oscillator, the oscillator gets disabled when the transistors conduct. Capacitor C1 prevents rise of the collector voltage of T2 again during the negative half cycles.

When the power fails, the electrical field around the equipment's wiring ceases and T1 and T2 turn off. Capacitor C1 starts charging via R1 and preset VR and when it gets sufficiently charged, the oscillator is

enabled and the piezobuzzer produces a shrill tone. Resistor R1 protects T2 from short circuit if VR is adjusted to zero resistance.

The circuit can be easily assembled on a perforated /

breadboard. Use a small plastic case to enclose the circuit and a telescopic antenna as aerial. A 9V battery can be used to power the circuit. Since the circuit draws only a few microamperes current in the standby mode, the battery will last several months. After assembling the circuit, take the aerial near the mains cable and adjust VR until the alarm stops to indicate the standby mode. The circuit can be placed on the equipment to be monitored close to the mains cable.