Alarm monitors rotational speed of dc motor

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You can use the circuit in **Figure 1** to monitor the rotating speed of a dc fan motor and sound an alarm if the motor stalls. One potential application of the circuit is monitoring the CPU-fan speed in a PC in which overheating the CPU can ruin the whole system. A PC BIOS (basic input/output system) often has a limited capability for monitoring the speed of CPU or chassis fans during boot-up. Moreover, if you enable the CPU-fan-protection function of BIOS today, you can have a problem with it tomorrow: If the fan's starting acceleration slows down, the BIOS powers down the PC at the beginning of the boot sequence, not allowing you to go into BIOS settings to correct the situation. So, the manual often advises you to disable this fan function. The circuit in **Figure 1** shows how to implement continuous monitoring and sound an alarm and automatically power off the system if a fan problem occurs.

The impulses on R_1, arising from commutation in the fan's brushless motor, start up the Schmitt trigger, Q_1/Q_2, which controls transistor switch Q_3, commutating the sense pin of the fan's motherboard connector; the frequency of commutation is proportional to the rotation speed. Optionally, the output of the trigger resets the timer with two time-out periods; the expiration of the first time-out activates the alarm buzzer.

After the second time-out, transistor Q_5 powers down the PC with or without the relay switch. The relay switching is more consistent, is less prone to interference, and is preferable when the distance between this circuit and the power-switch connector on the motherboard exceeds 20 to 30 cm. You must connect the collector of Q_5 or the contacts of the relay in parallel with the power-switch button. The alarm circuit comprises Q_4 and a three-terminal piezoelectric buzzer.EDN
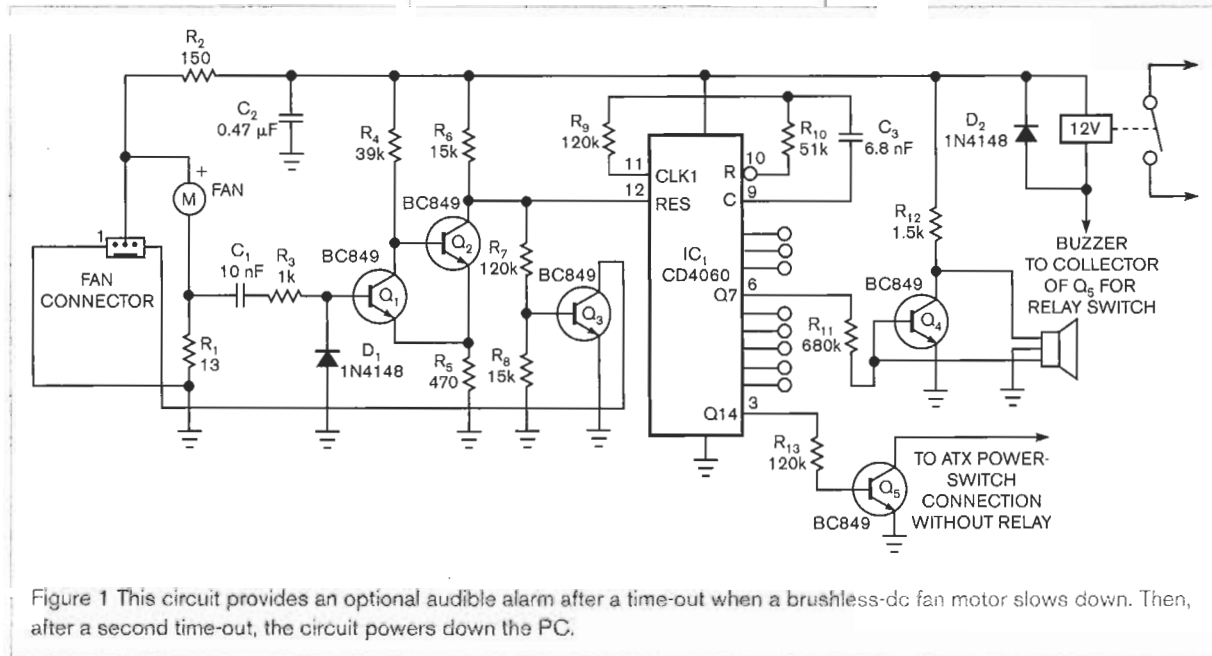

Figure 1 This circuit provides an optional audible alarm after a time-out when a brushless-dc fan motor slows down. Then, after a second time-out, the circuit powers down the PC.