

It is often useful for audio or video equipment to be switched off automatically after there has been no input signal for a while.

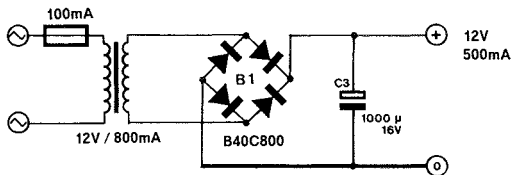
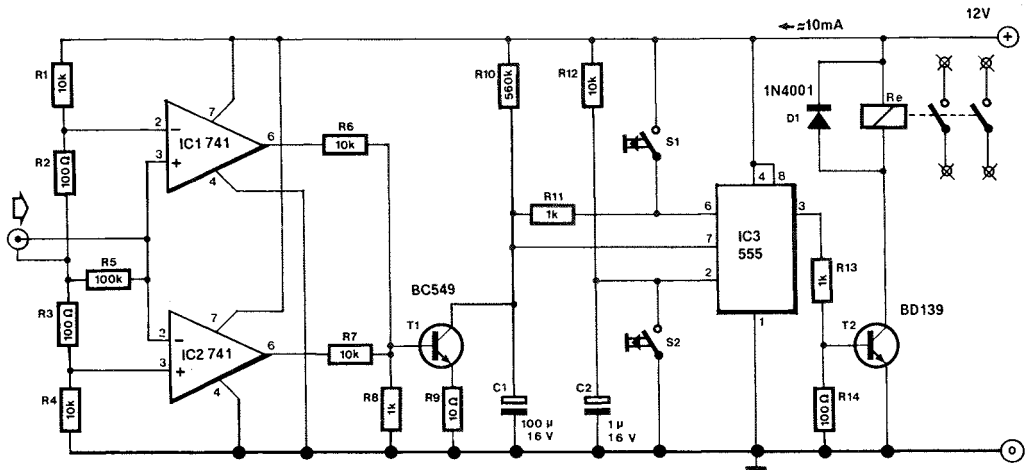
The function of the on-off switch in such equipment is then taken over by switch S_2 in the accompanying diagram. It remains, however, possible to switch off manually by means of S_1 . Automatic switch-off occurs after there has been no input signal for about 2 minutes: this delay makes it possible for a new record or cassette to be placed in the relevant machine.

The audio input to the proposed circuit may be taken from the output of the relevant TV set, amplifier, or whatever. The input earth is held at +6 V with respect to the circuit earth by potential divider R_1 - R_2 - R_3 - R_4 . The two 741s function as comparators: the output of IC_1 goes high when the input signal is greater than +50 mV, whereas the output of IC_2 goes high when the input signal becomes more negative than -50 mV. Resistors R_6 , R_7 , and R_8 form an OR gate that drives transistor T_1 . If the output of either IC_1 or IC_2 is logic 1, T_1 conducts.

The 555 operates as a retriggerable monostable, whose period is determined by R_{10} and C_1 . The device is triggered when its pin 2 is earthed by the closing of S_2 . Its output, pin 3, then remains high for 1 to 2 minutes, depending on the leakage current of the 555. The monostable resets itself as soon as the potential across C_1 exceeds a certain value. As long as there is an input signal to the circuit, T_1 conducts and C_1 remains uncharged. As soon as the audio signal ceases, T_1 switches off, and C_1 charges until the potential across it is sufficient to reset the 555. The monostable may also be reset by closing S_1 , which connects pin 6 of the 555 to +12 V.

When IC_3 is reset, C_1 is discharged via its pin 7. Resistor R_{11} serves as protection, because without it T_1 could short-circuit the supply lines.

When the output of IC_3 goes high, T_2 conducts, the relay is energized, and the relay contacts switch on the mains voltage as appropriate. To counter the induced potential when the relay contacts close, which could damage T_2 , diode D_1 has been connected in parallel with the relay coil.



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