AUTO SHUT-OFF FOR CASSETTE PLAYERS AND AMPLIFIERS

ARTHUR LOUIS

Here are two simple, low-cost circuits that can be used to shut off the mains supply to any audio or video equipment (such as tape recorder, CD player, and amplifier). These circuits are helpful to those in the habit of falling asleep with their music system on.

The circuits will also protect the equipment from getting damaged due to high-voltage spikes whenever there is a resumption of power after a break. This is possible because the equipment will get switched off automatically under such conditions but will not get switched on automatically on resumption of mains supply.

The circuit in Fig. 1 can be used to shut off any cassette player that has a reliable auto-stop mechanism. Whenever switch S1 is pressed momentarily, it extends the supply to the step-down transformer of the tape recorder and charges capacitor C1 through diode D1. This, in turn, makes transistor T1 conduct and energise relay RL1 to provide a parallel path to switch S1, so that supply to the step-down transformer continues even when switch S1 is released.

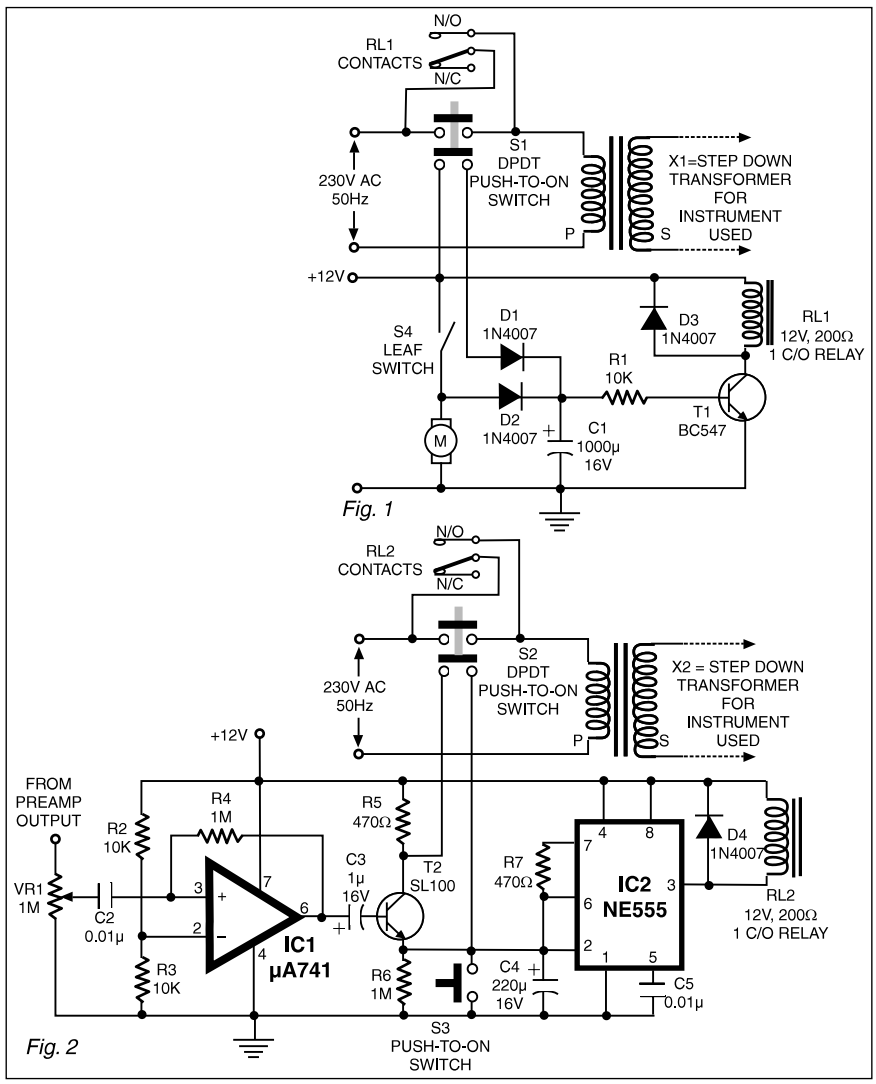
When any button on the cassette player is pressed, the capacitor charges through diode D2. This ensures conduction of transistor T1 and thus the continuity of operation of cassette player. However, whenever the auto-stop mechanism functions at the end of a tape, the leaf switch gets opened. This cuts the charging path for the capacitor and it starts discharging slowly. After about one minute, the relay opens and interrupts main power to the transformer. The time delay can be increased by increasing the value of capacitor C1.

If the appliance used is a two-in-one type (e.g. cassette player-cum-radio), just connect another diode in parallel with diodes D1 and D2 to provide an additional path for charging capacitor C1 via the tape-to-radio changeover switch, so that when radio is played the relay does not interrupt the power supply.

The other circuit, shown in Fig. 2, functions on the basis of the signal received from preamp of the appliance used. In this circuit, opamp µA741 is wired in inverting opamp configuration. It amplifies the signal received from the preamp. Timer NE555 is used to provide the necessary time delay of about one minute.

Preset VR1 is used to control the sensitivity of the circuit to differentiate between the noise and the signal. Resistor R4 offers feedback resistance to control the gain of the opamp. By increasing or decreasing the value of resistor R4, the gain can be increased or decreased, respectively. The preset time delay of timer NE555 (which is about one minute) can be increased by increasing the value of C4.

Initial energisation of relay RL2 and charging of capacitor C4 take place on depression of switch S3 in the same manner as charging of capacitor C1 (refer Fig. 1) on depression of switch S1. As a result, pins 2 and 6 of NE555 go high and the output of timer goes low to switch off mains supply from the relay to step-down transformer X2 of the appliance. Bleeder resistor R6 is used to discharge capacitor C4. Now if signals are received from the



preamplifier, these are amplified by 741 and fed to the base of transistor T2, which keeps capacitor C4 charged through resistor R5. When there is no signal, T2 will not conduct and the capacitor slowly discharges through R6. The output of 555 goes high to switch off the relay and thus the mains supply to transformer X2. Switch S2 can be depressed momentarily if the device needs to be manually switched off.

Note. The 12V supply should be provided to the circuit from the equipment's power supply. Opamp 741 should be driven from the preamplifier of the gadget used, and not from its power amplifier output. Switches S1 and S2 are 2-pole push-to-on switches. These can also be fabricated from 2-pole on-off switches, which are widely used in cassette players, by removing the latch pin from them.❑