

Home Alarm System

THE circuit diagram in Fig. 2 is a simple home alarm system panel designed to provide some of the more useful features of commercial panels at a fraction of the cost. The loops marked as "Zone 1", "Zone 2" and "Entry/Exit" (S4, S5, S7) are normally-closed alarm sensors. The "Tamper Loop" (S6) is also a normally-closed tamper protection circuit.

If Zone 1, for example, was opened then pin 2 of the OR gate IC1a would be brought high via resistor R1, thus causing l.e.d. D5 to light, and the monostable IC5 would also be triggered via transistor TR5. The relay contacts RLA1 will close for a period set by VR2.

A triggering circuit, comprising of TR5 and capacitor C8, is required because if the sensor (S4) connected to the OR gate were to remain permanently open (e.g. a broken window strip), then the alarm would sound indefinitely. Resistor R16 allows C8 to discharge a few seconds after the zone (e.g. a PIR) has been closed again thus resetting the alarm.

The three key switches S1 to S3 may take many forms, but to disarm the alarm they must be closed and to arm the system and trigger the exit timer they must be open. On the prototype, the "Lock" was a 36-way Centronics socket and the "Key" simply a matching plug with six pins jumpered.

Exit time is provided by means of IC4, another NE555 monostable timer. With "key switch" S1 closed (system disarmed) pin 2 of IC4 is grounded (0V) thus output pin 3 of the timer is held high. This output is inverted by IC3c and fed to one input of IC2a (a 4081 AND gate), the output of which connects to the set input of the bistable latch formed by IC3a and IC3b. Assuming the Exit timer IC4 has timed out then pin 2 of IC2a will be high but pin 1 will be low (Exit/Entry zone closed).

Upon opening of the entry/exit zone the bistable will be set, thus bringing its Q output (pin 4 of IC3b) high. This begins to charge

capacitor C3 to give an entry time of about 17 seconds before pin 5 of IC1a is brought high. If the key is inserted during this interval then the Alarm Bell Timer (IC5) is disabled, the exit timer re-established and the bistable is reset. If not then the alarm sounds as before. Capacitor C4 provides power on reset for the bistable and the l.e.d.s. D1 to D4 provide visual indication of zone status.

A power supply circuit capable of charging a lead acid battery is shown separately in Fig.3b. The alarm circuit could easily be modified to accept more zones by the use of the second OR gate in the 4072 package.

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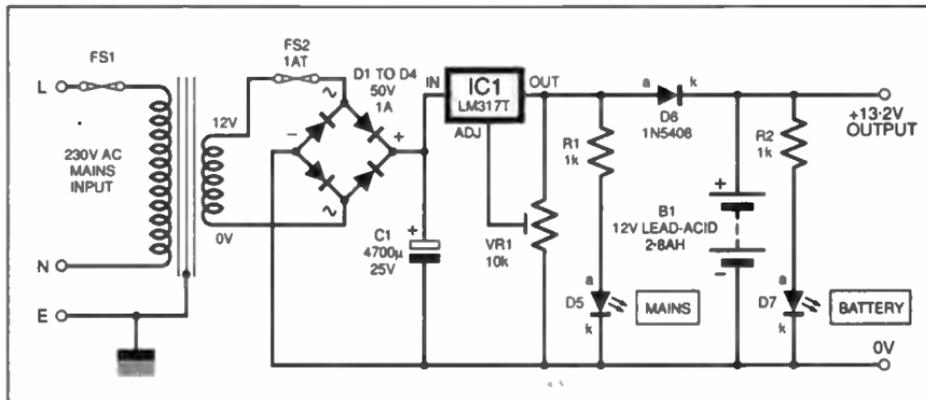


Fig.3. Suggested power supply/charger circuit for the Home Alarm System.

Fig.2. Control circuit diagram for the Home Alarm System

