

# mains on delay circuit

The delay is intended to switch on the mains to heavy loads gradually to ensure that the switch-on current remains within certain limits and to prevent the fuses from blowing. The elements that cause high currents at switch-on are, for instance, the electrolytic capacitors in the power supply of an output amplifier. Since these are not charged at switch-on, they constitute a virtual short-circuit on the supply lines. The current can, however, be kept within limits by inserting the present delay circuit between the mains outlet and the transformer primary. The amplifier is then powered in two stages: in the first instance, the current is limited by a number of heavy-duty series resistors; a second later these resistors are shunted (short-circuited) by a relay contact.

In the diagram,  $R_4$ – $R_7$  are the heavy-duty series resistors, each with a value of  $10\ \Omega$  and rated at 5 W. They limit the switch-on current to about 5.5 A.

The relay is a type whose contact is rated at 2000 VA, which will be sufficient in most cases. Its supply is derived directly from the mains via potential divider  $R_3$ – $C_1$ – $B_1$ –relay coil. The resistor,  $R_3$  limits the current at switch-on, after which  $C_1$  limits the current in normal operation to about 20 mA. The delay time is determined by electrolytic capacitors  $C_2$  and  $C_3$  in parallel with the relay. The delay time may be altered by suitably changing the value of one or both of these capacitors.

For safety's sake, the board also has provision for a mains fuse,  $F_1$ . The rating of this depends, of course, on the current drawn by the load.

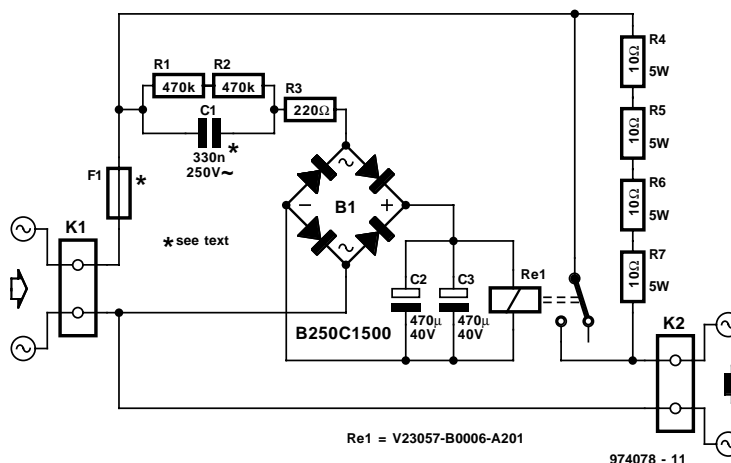
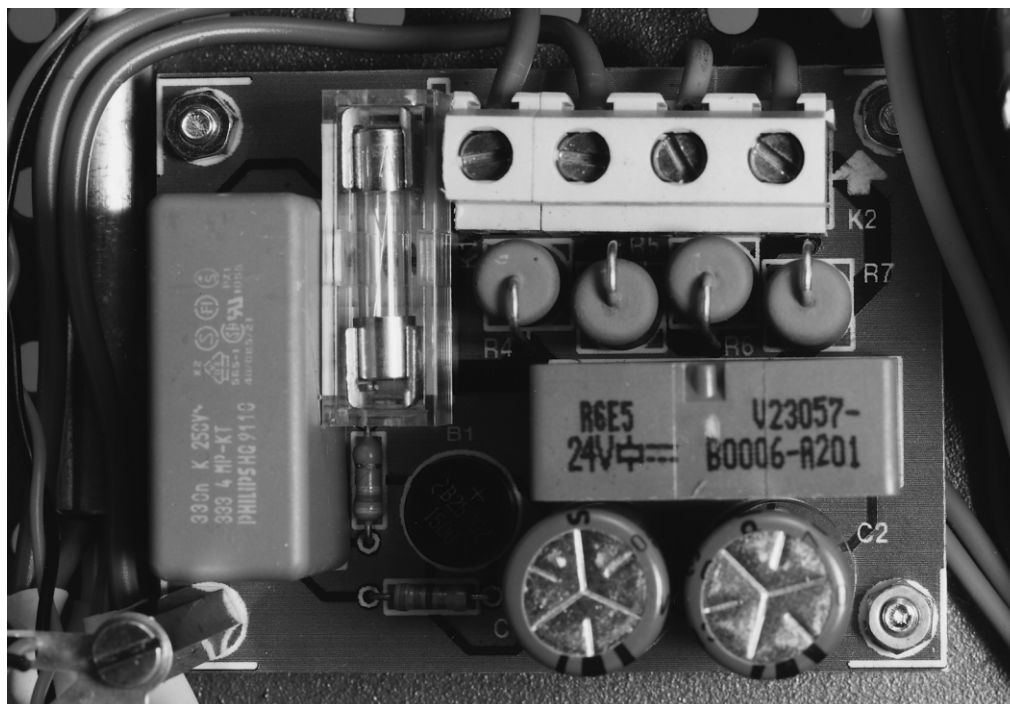
It should be noted that in the case of a double-mono stereo output amplifier (with separate power supplies) each of the mono amplifiers must be given a mains-on delay.

As mentioned earlier, the values of  $R_4$ – $R_7$  refer to a switch-on current of about 5.5 A. If the power rating of the load is lower than 200 VA, it is advisable to use resistors with a slightly higher value.

Note that  $C_1$  is a metallized paper type, which is designed specially for mains voltage applications and meets stringent regulatory requirements.

Finally, at all times bear in mind that the circuit is connected to the mains, so do not touch anything inside the unit during operation and make sure that all wiring is safe and secure.

[Giesberts – 974078]



Re1 = V23057-B0006-A201

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## Parts list

### Resistors:

$R_1, R_2 = 470\ \text{k}\Omega$   
 $R_3 = 220\ \Omega$   
 $R_4$ – $R_7 = 10\ \Omega, 5\ \text{W}$

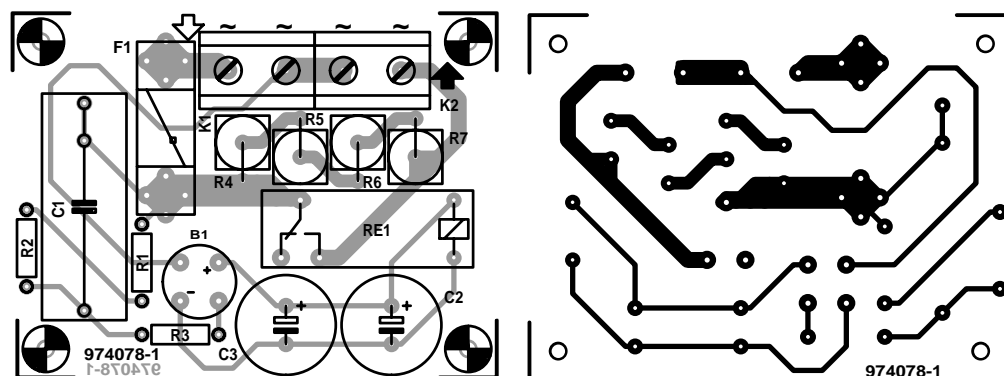
### Miscellaneous:

$K_1, K_2 = 2$ -way terminal block, pitch 7.5 mm  
 $B_1 = B250C1500$ , round  
 $RE_1 =$  contact rating 250 V, 8 A, coil 24 V, 1200  $\Omega$

$F_1 =$  see text

### Capacitors:

$C_1 = 0.33\ \mu\text{F}$ , 250 VAC, metallized paper  
 $C_2, C_3 = 470\ \mu\text{F}$ , 40 V



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