

DELAYED SWITCH ON FOR SPEAKERS

THIS circuit connects the loudspeaker to a power amplifier a few seconds after the amplifier is switched on, thereby avoiding turn on 'thumps' and possible damage to the speaker.

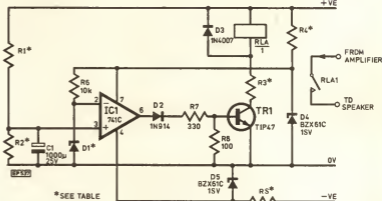
When the power is switched off, the speaker will be disconnected when the rail voltage falls by about 30%; the time taken depending on whether the amplifier is handling a signal. This disconnection protects the speaker from the d.c. offsets at the output, and oscillations that occur in many power amplifiers a few moments after being switched off.

If the amplifiers form part of a large system driven at high levels, and a power failure occurs, then the speakers will be disconnected very rapidly. Even if the power is immediately reinstated, the connection of the speakers will be delayed, thus turn on 'thumps' from preamps, mixing desks, crossovers, etc, will cause no damage.

D1 sets up a reference voltage at pin 2 on the comparator (IC1). At the moment of turn on, the voltage at pin 3 is zero and the output voltage swings negative, hence TR1 and RLA remain off. C1 charges via R1 and when the voltage on pin 3 of IC1 exceeds the reference, the output (pin 7) swings positive, turns on TR2, which in turn connects the RLA and the speaker. When the power is disconnected, the supply rail falls rapidly (provided a speaker is being driven) and the relay will 'drop out' naturally when the supply rail falls to a fraction of its nominal value. In addition, C1 discharges via R2 and when the voltage on pin 3 of IC1 falls to some 70% of its original value, the comparator output will swing negative and turn off TR1, hence RLA and the speaker.

The voltage on pin 2 of IC1 is normally some 70% of that on pin 3 to allow for variations in the rail voltage which occur in the unstabilised power supplies common to all high quality audio power amplifiers.

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Power	Max. voltage	R1	R2	R3	R4	R5	RLA.	D1 (All BZX85 or BZX61c)
17w into 8Ω				Link				
35w into 4Ω	24V	10K	2K	across	470R	1K2	24V	3V3
40w into 8Ω				1 watt	1 watt			
80w into 4Ω	35V	10K	1K5	220R	1K	2K7	24V	3V3
80w into 8Ω				Link	1 watt			
150w into 4Ω	47V	10K	1K	across	1K6	4K3	48V	3V6
150w into 8Ω		1 watt		1 watt	2 watt	1 watt		
250w into 4Ω	63V	10K	1K	560R	2K2	6K8	48V	4V7
250w into 8Ω		1 watt		2 watt	4 watt	1 watt		
500w into 4Ω	85V	10K	1K	1K5	3K3	10K	48V	6V2

All Resistors $\frac{1}{2}$ watt unless otherwise indicated.