

STEREO SPEAKER PROTECTOR

The advent of the superamplifier, capable of supplying 100 to 200 watts per channel on a continuous basis, has been both a blessing and a curse to the audiophile. The blessing is that a recording's dynamic range can now be more faithfully reproduced, even with inefficient loudspeakers. Unfortunately, these amps are so powerful that loudspeakers can often be overdriven and eventually destroyed, if sufficient care is not exercised. If your amp lacks provisions for speaker protection, you may want to build the speaker protector diagrammed here.

The contacts of relay K1 are hooked in series with your right-and left-hand speakers in such a way that, when K1 is unenergized, its contacts close and complete the circuit to each loudspeaker.

Inputs to the protection circuit come from your amp's outputs (the same outputs that drive the speakers). If the signal feeding the 'right' input is sufficiently large to charge C1 to a potential greater than the breakdown voltage of Q1's emitter, a voltage pulse will appear across R7. Similarly, excessive inputs to the 'left' channel will also produce a pulse across R7, this time due to the discharge of C2 by Q2. The pulse across R7 triggers SCR Q3, which latches in a conducting state and energizes K1. This interrupts both speaker circuits, and the resulting silence should alert you to a problem. Cut back on your amp's volume; then, press and release S1 to reset the circuit and restore normal operation.

The circuit can be adjusted to trip at lower levels from 15 to 150 watts rms. To calibrate, feed a deliberately excessive signal to the 'right' input, and raise R3's wiper up from ground until K1 pulls in. Disconnect the signal from the 'right' input, and apply it to the 'left' input. Press S1 to reset the circuit, and raise R4's wiper up from ground until K1 pulls in again. The circuit is now calibrated. Your calibration signal should preferably be a continuous tone, but a musical passage of fairly constant loudness will probably suffice. K1's contacts should be rated to carry a 3- to 5-amp load.

PARTS LIST FOR STEREO SPEAKER PROTECTOR

- C1, C2—.22 uF capacitor
- D1, D2, D3—1N914 diode
- K1—6-volt relay, DPDT contacts (see text)
- Q1, Q2—2N2646 unijunction transistor (Radio Shack RS2029)
- Q3—2N5060 sensitive-gate SCR
- R1, R2—100-ohm, 1/2-watt resistor 10%
- R3, R4—100-ohm linear-taper potentiometer
- R5, R6—220K-ohm, 1/2-watt resistor
- R7, R10—100-ohm, 1/2-watt resistor
- R8, R9—1,000-ohm, 1/2-watt resistor
- S1—N.O. pushbutton switch

