

# SWITCHING CIRCUITS FOR 4-OHM SPEAKERS

Virtually all receivers and integrated preamplifier/amplifiers have multiple output terminals for connection of two sets of speaker systems, with front-panel switching so that either pair can be played alone or both pairs simultaneously. The speaker selector switch may be labeled "Main — Remote — Both", "A — B — A + B" or some such legend. In the "A + B" setting the speaker pairs are connected in parallel, and the total load on the amplifier is of lower impedance than it is with either pair alone connected.

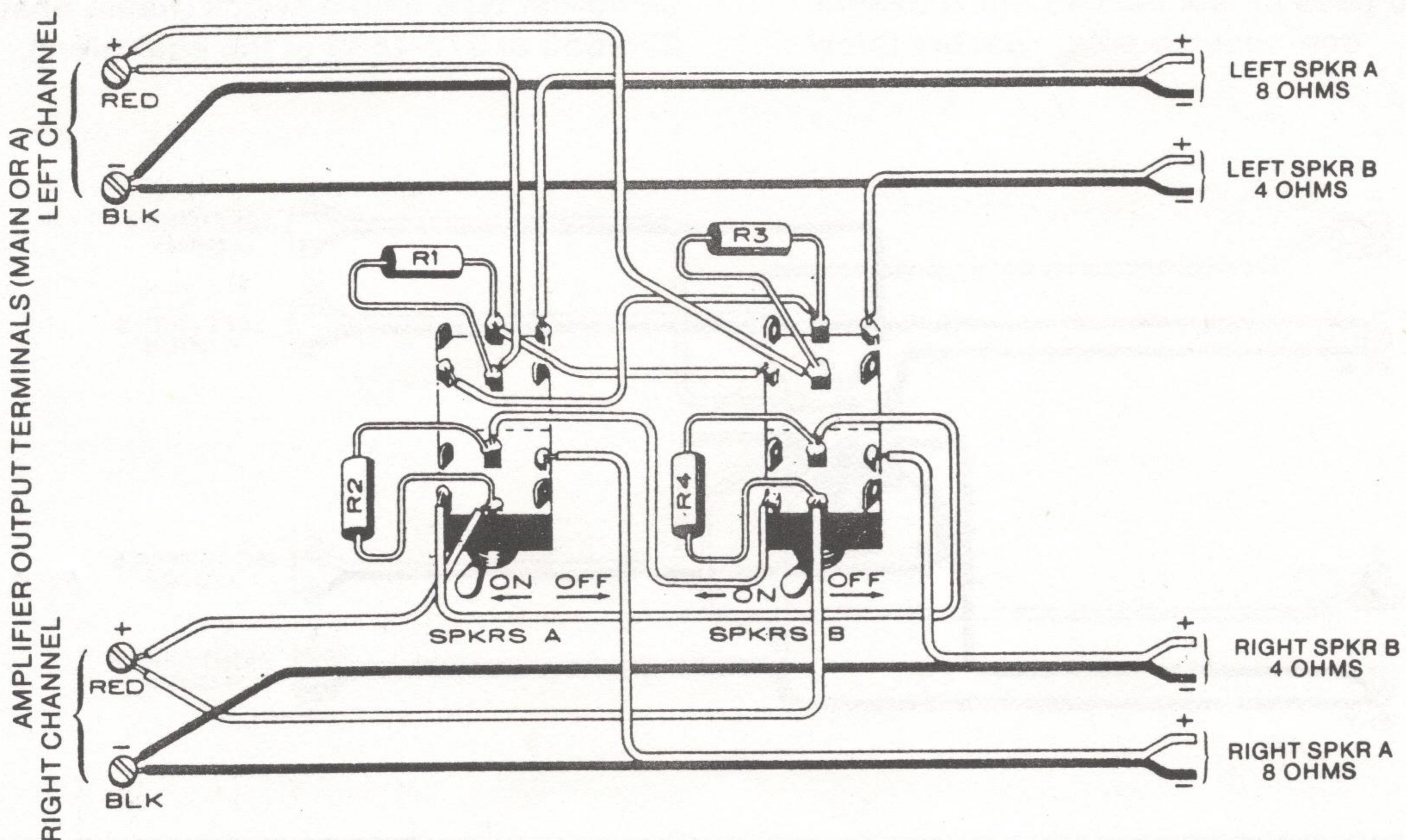
This is not a problem if both pairs of speaker systems are of 8 ohms nominal impedance. The total load impedance in the "A + B" mode is then 4 ohms, which is high enough to be a safe load for all high-quality receivers and amplifiers. But 4-ohm and 8-ohm speakers used together have a total impedance of  $2\frac{2}{3}$  ohms, and two 4-ohm speakers in parallel are 2 ohms. These are not safe loads generally (although a very few amplifiers will tolerate them).

The externally-wired switching circuits shown here do allow the use of 4-ohm speakers simultaneously with others. The diagrams are for 4- and 8-ohm pairs; for two unlike 4-ohm pairs; and for two identical 4-ohm pairs. In all of the circuits, when **only** the "A" or the "B" pair is turned on, it is driven directly, with no resistors in the circuit. In the "A + B" mode of the circuit for two identical 4-ohm pairs, the speakers on each channel are wired in series, making an 8-ohm load. In the other two circuits, resistors are added in the "A + B" mode to maintain a 4-ohm total load.

The diagrams are pictorial, rather than schematic, for easy wiring.

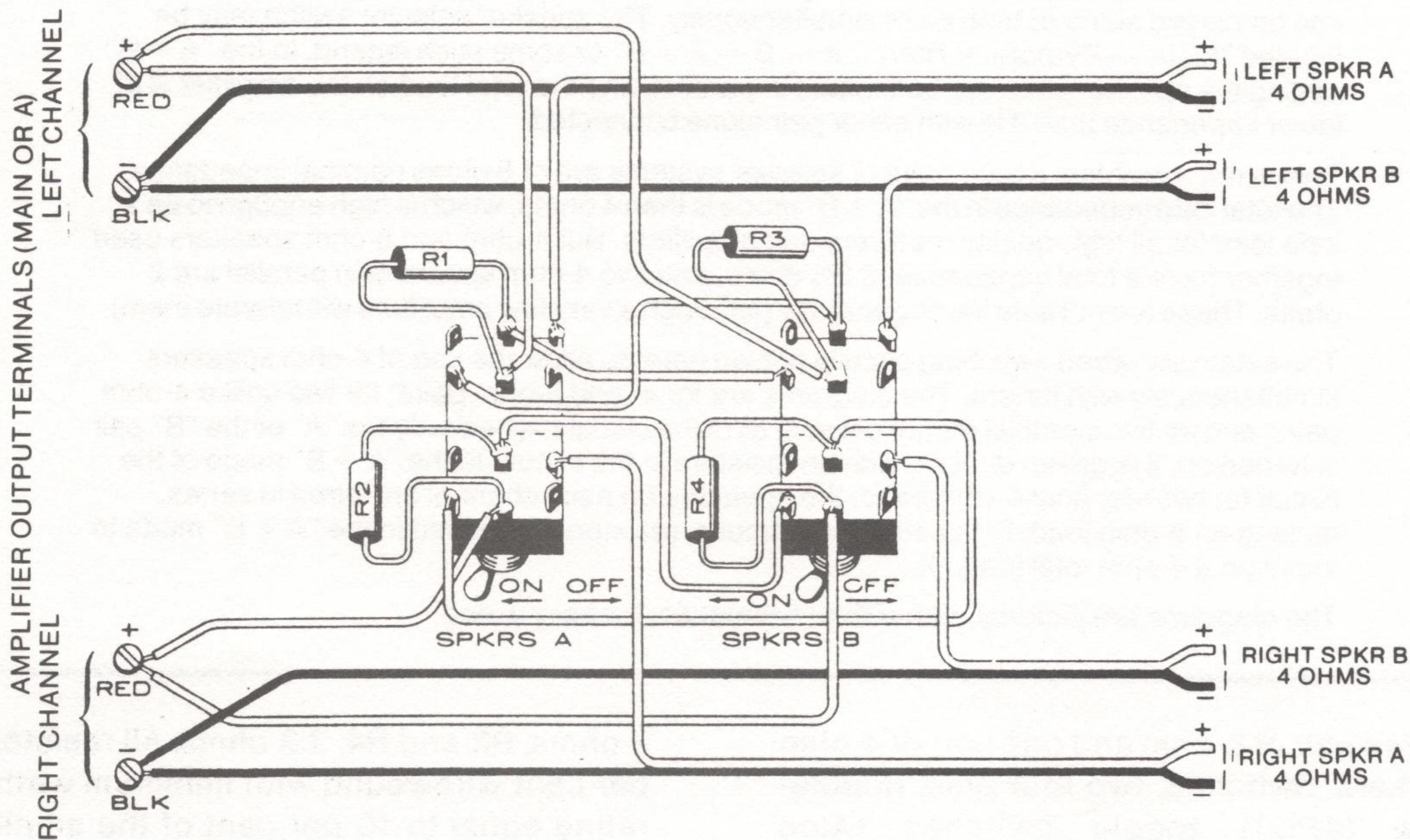
For one pair of 8-ohm and one pair of 4-ohm speakers. Switches: two four-pole, double-throw (4PDT) toggle switches (Alco MTA-406N or equivalent), or four DPDT toggle switches. Resistors: R1 and R2,

2 ohms, R3 and R4, 3.3 ohms. All resistors 5 per cent wirewound with minimum wattage rating equal to 10 per cent of the amplifier power rating.



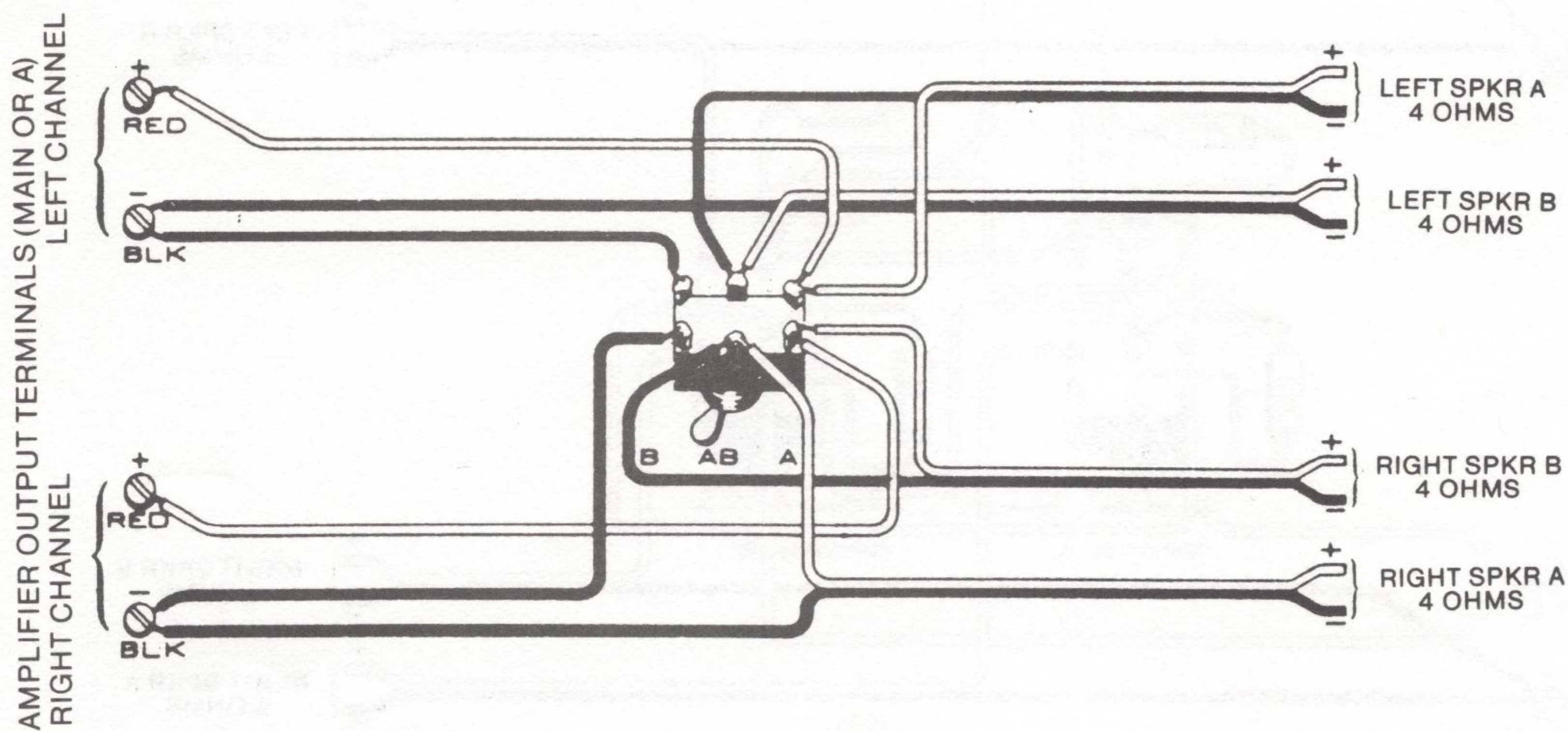
For two non-identical pairs of 4-ohm speakers. Switches: two four-pole, double-throw (4 PDT) toggle switches (Alco MTA-406N or equivalent, or four DPDT toggle

switches. Resistors: R1, R2, R3, and R4, 3.3 ohms. All resistors 5 per cent wirewound with minimum wattage rating equal to 10 per cent of the amplifier power.



For two pairs of identical 4-ohm speakers. Switch: one double-pole, double-throw

center-off-type toggle switch (Radio Shack 275-653 or 275-1533 or the equivalent).



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