

BUILD A LOW-DISTORTION COMPRESSOR

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Many circuit topologies are possible for use in tube compressors. Although most of these designs produce a high distortion level, the balanced topology presented here produces very low distortion.

As shown in *Fig. 1*, the input signal is fed to a line transformer. The transformer's secondary winding must have a center tap. The secondary impedance can be anywhere in the range of 600Ω – $10k\Omega$. The input signal is

fed to the right part of tubes V1 and V2. The signal is also fed to the left parts of these tubes, although in opposite phase and at only one-tenth of the amplitude. The grid of the left part is normally held at $-2.5V$ when no compression occurs. When compression occurs, the grid potential becomes positive, while the current in the left section increases and the current in the right portion decreases. The end result is a reduced output amplitude.

The signal from V1 and V2 is then fed

to the long-tailed pair, V3. The signals added to the long-tailed pair cancel the second-order harmonic, the most dominant source of distortion from tubes V1 and V2. The output from V3 is fed to cathode follower V4A.

to page 37

TABLE 1

PARTS LIST

COMPRESSOR RESISTORS

| | |
|------------------|-------------------------|
| R1, R2 | 100k |
| R3, R4 | 10k |
| R5, R6 | 1k |
| R7, R8, R11, R12 | 33k 1W |
| R9, R10 | 68k 2W |
| R13 | 33k 2W |
| R14, R15 | 100k |
| R16, R17 | 22k 2W |
| R18 | 1M |
| R19 | 100k log. potentiometer |
| R20 | 10k lin. potentiometer |
| R21 | 330Ω |
| R22, R24 | 68k |
| R23 | 150k |
| R25 | 15k |

CAPACITORS

| | |
|--------|--------|
| C1, C2 | 0.22μF |
| C3 | 0.1μF |
| C4, C6 | 10nF |
| C5 | 3.3μF |
| C7 | 22μF |
| C8 | 0.33μF |

MISCELLANEOUS

| | |
|--------------|--------------------------|
| BR1 | 400V/1A |
| BR2 | 5.6V zener diode |
| V1, V2 | 6ES8/ECC189 |
| V3, V4 | 6DJ8/ECC88 |
| TR1 | Line transformer |
| POWER SUPPLY | |
| R1–R4 | 330Ω 2W resistors |
| F1 | 1A slow-blow fuse |
| F2 | 0.5A slow-blow fuse |
| F3, F4 | 0.1A fast fuse |
| BR1 | 400V 1A bridge rectifier |
| BR2 | 100V 6A bridge rectifier |
| D1 | 1N4001 |
| C1–C6 | 220μF 250V cap. |
| C7 | 10,000μF 25V cap. |
| C8 | 1μF 16V cap. |
| TR1 | 270V 65mA CT transformer |
| TR2 | 15V 2A transformer |
| IC1 | 12V 2A regulator |

FIGURE 1: Low-distortion compressor circuit topology.

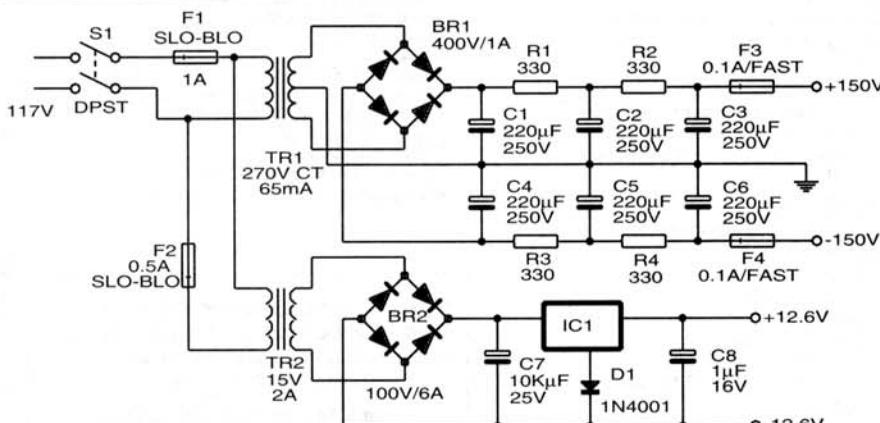


FIGURE 2: Power-supply schematic for a stereo compressor.