

Fig. 3. Practical realisation of design 3, which provides good stability and an easy-to-implement circuit. Two ECC88 double triodes are used at the input.

pair. In this way each output valve has its own DC regulation, regulated by its associated EF86.

Using the EF86, the long-tail pair has a higher output impedance. This tends to cause a problem with high frequencies if no feedback is used. However, gain is high so more feedback can be applied to overcome this problem.

Square waves fed into this amplifier come out fine. Overall feedback is approximately 10dB.

Good stability, simpler circuit – design 3

We tried replacing the three EF86s with two ECC88s, Fig. 3. Stability was just as good. After 36 hours of continuous operation, the voltage across the cathode resistors of the EL84s changed only 0.3V.

Only 2dB feedback is used here. Current for the long-tail pair can be set by changing the 100kΩ resistor connected to the negative supply. It is approximately,

$$\left(150 \frac{100k}{100k + 180k}\right) \div 15k$$

or about 3.6mA. This configuration should also work with ECC85s.

Amplifier design 4

Figure 4 shows a practical DC-coupled design using an ECC85, a current source and two additional potentiometers. These pots are there to allow current and the high voltage of the input stage to be adjusted.

Current of the ECC85 is set to half that of ECC88. The other section of the ECC88 is used in the plus section of the power supply, in this way the voltage of the input stage is adjustable.

The grid of the ECC88 is controlled by the resistor divider between the negative rail and ground. Using the potentiometer, the high voltage can be easily set to approximate 206V.

The current source should be set to approximately 1.7mA. Bear in mind that the current source should be adjusted in so that the anode voltage of the ECC85 reads +74V.

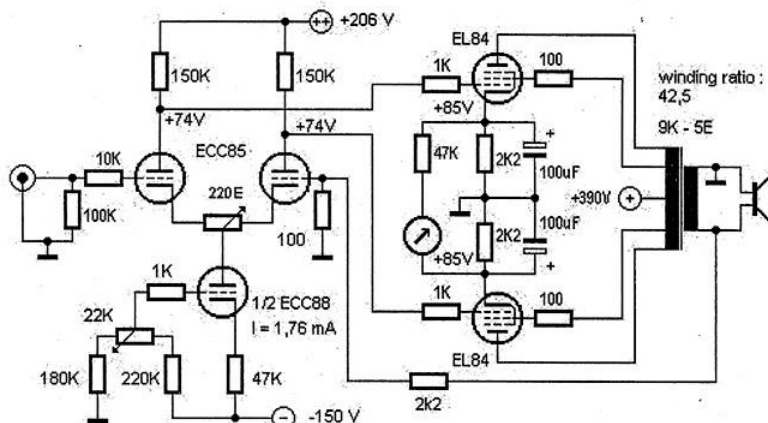
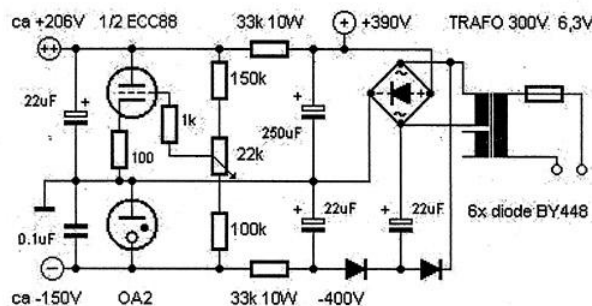


Fig.4. Of the four designs, this one is the most practical. It provides good stability and is easy to adjust.



Power supply for amplifier design 4 with a simple triode shunt regulator on the positive supply and a neon shunt stabiliser for the -150V rail.

Technical support

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