

TOP-OF-THE-LINE “RIBBON” ALL-FET CLASS-A POWER AMPLIFIER.

EB-700/343 DRIVER WITH REGULATORS.

The “RIBBON” driver is a Top-of-the Line driver circuit, intended for ribbon/electrostatic speakers and high-speed cone speakers. Its high speed, high resolution and transparency makes it equally applicable in high-end home systems as in studio monitor and recording applications. Its unprecedented tonal balance lets you use it in full-range systems and its silky mids and highs make it ideal for mid-range and tweeter drivers. Within its power range it can compete with all power amps on the market, irrespective of price.

With a maximum supply voltage of $\pm 45V$ ($\pm 50V$ unregulated), it can deliver up to 50W. If the power supply and the output stage are chosen correctly, all of this can be delivered in pure Class-A.

The circuit diagram is shown in fig. 1.

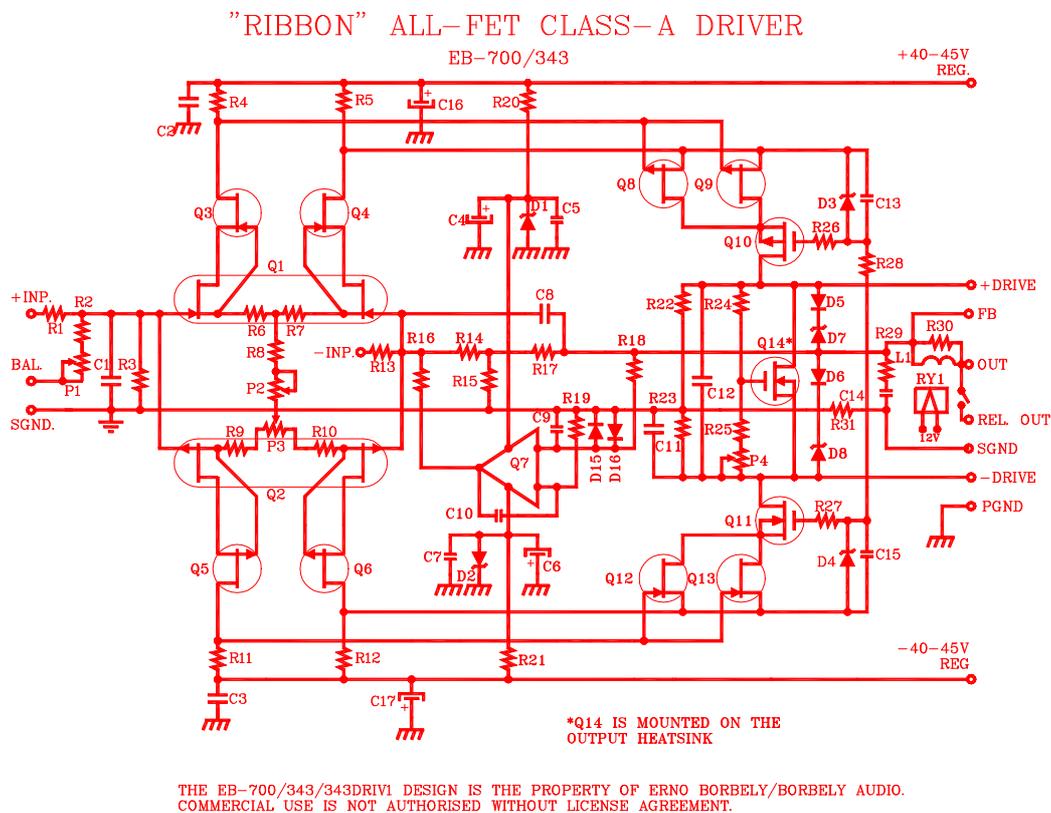


Fig. 1. The “RIBBON” ALL-FET driver circuit.

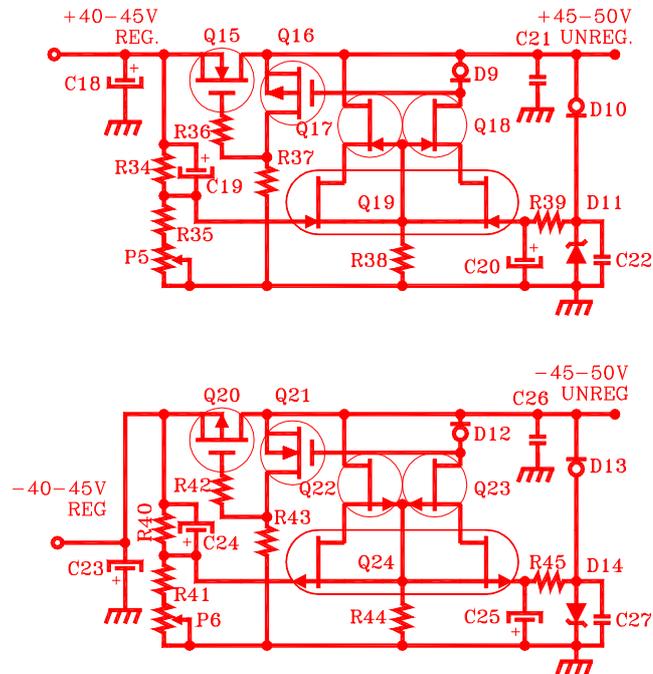
The circuit is a fully complementary design, using only FETs as active elements. The input stage is a complementary differential cascode JFET circuit, using dual monolithic JFETs as input devices. The second stage consists of two JFETs in parallel and a MOSFET, connected in cascode. The JFETs are operated at 8mA each, providing a total of 16mA drive for the output stage.

The bias circuit is a V_{gs} multiplier, using a MOSFET. The MOSFET itself, a TO-220 device, is selected according to the MOSFETs used in the output stage and is mounted on the output heatsink, if necessary. This ensures proper bias tracking with the different output MOSFETs. The output offset is tracked and controlled by Q7, which is a JFET-input opamp. Two shunt regulators provide $\pm 10V$ supply voltage for the opamp.

The driver circuit is supplied from on-board ALL-FET discrete regulators see fig. 2.

"RIBBON" ALL-FET REGULATORS

EB-700/343



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Fig. 2. ALL-FET discrete regulators.

Each regulator is one half of a complementary ALL-FET power amplifier. The regulators are made up of a differential cascode input stage, and a single MOSFET driver and output stage. The reference voltage is provided by 6.9V low-noise buried-zener reference diodes, which are fed from JFET constant current sources. Output voltage can be adjusted between 20 and 45V. Minimum input/output voltage difference is 4V, but, to make sure that the regulator is always operating correctly, we recommend a difference of 5V. Maximum input voltage is 50V.

EB-1199/114 ALL-FET CLASS-A OUTPUT STAGE.

Recommended output stage for the "RIBBON" driver is the EB-1199/114, laid out for one pair of TO-220 GSD driver MOSFETs and five pairs of TO-3P GSD output MOSFETs. The output MOSFETs are matched and do not require source resistors. The EB-1199/114, if properly heatsinked, can deliver up to 50W in pure Class-A and up to 100W in Class-AB. With the supply limitations of the "RIBBON" driver, the maximum output is 50W. The schematic is shown in fig. 3.

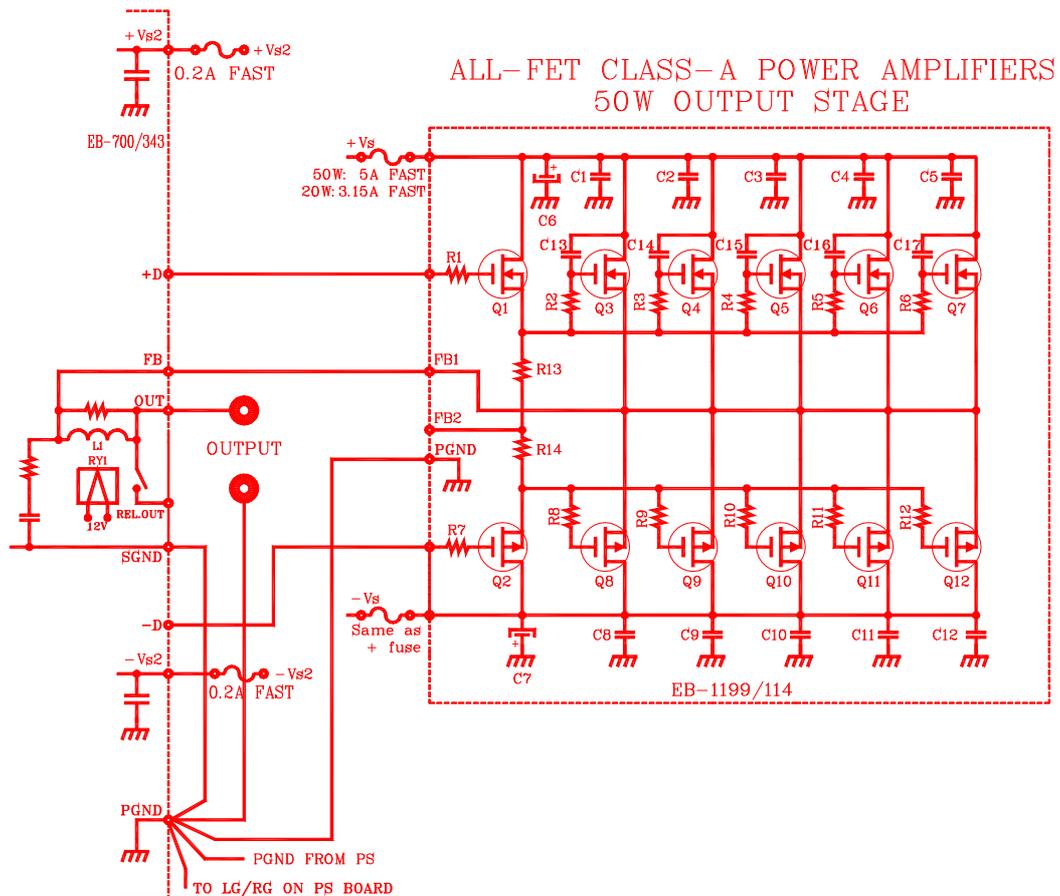
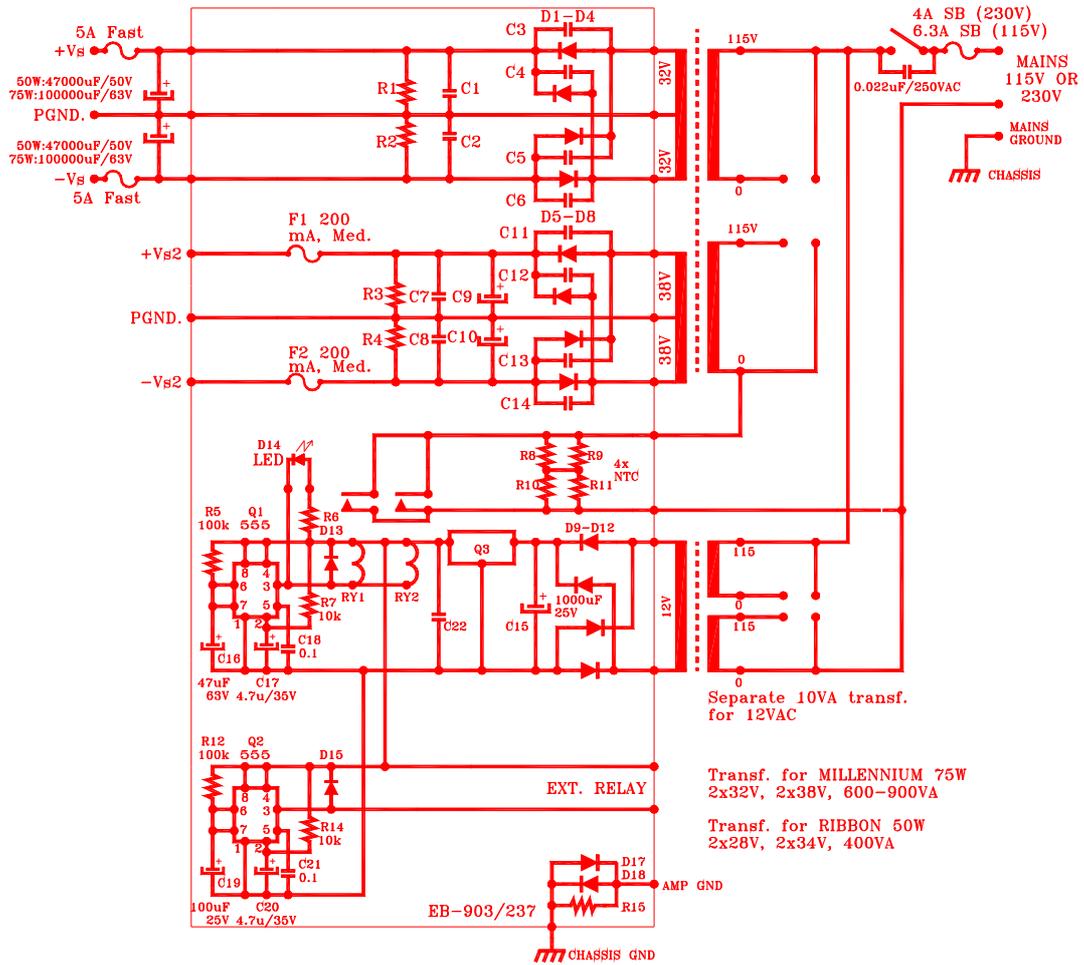


Fig. 3. The EB-1199/114 ALL-FET Class-A output stage.

EB-903/237 Power Supply.

The recommended power supply for a mono block “RIBBON” power amplifiers is the single PS board EB-903/237, see fig. 4. The 237 includes independent PS for the output and the driver, and two timers for the slow-turn-on circuit and for the output relay. The timer circuits should be supplied from a separate 12VAC transformer. The main electrolytics for the output stage are not included on the PCB, and not supplied in the kit. Minimum value for these caps is 47000uF. The mains transformers should be rated at min. 400VA.



POWER SUPPLY FOR ALL-FET 50/75W CLASS-A MONO BLOCKS
EB-903/237/PS75W237

Fig. 4 Single PS for RIBBON mono blocks.

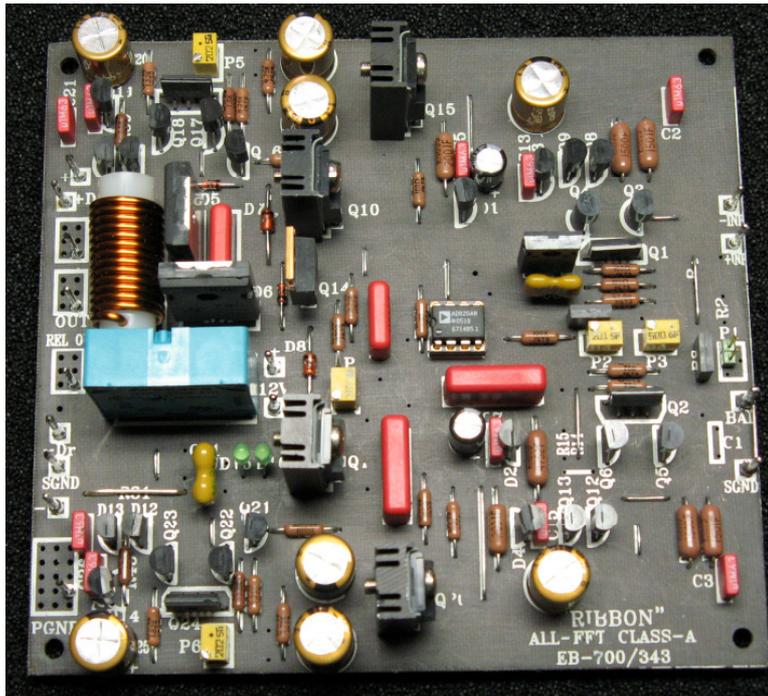


Fig: 5. The RIBBON driver on Teflon PCB, with Caddock upgrade.

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