Try a screen driven driver stage

by Rickard Berglund

Some output tubes (211, 845) need a very high drive voltage with low distortion. Some tube freaks have used the 300B tube as a driver but it is very expensive. Others have tried to use a triode connected EL34 but it is not linear enough.

A pentode driven on the screen grid is very linear. I have tried this concept in a new driver stage, as shown on the accompanying schematic. The first two tubes V1 and V2 form an asymmetrical mu-follower. V3 is a screen grid driven pentode. Adjust the potentiometer R9 to 350V DC at the plate of V3. You can use many different tubes for V3.

I made distortion measurements for some different tube types with the results given in table 2. EL36 and 5881 are the two best tubes. The linearity of these two tubes in this "enhanced" mode is even better than for a 300B tube used as a driver.

The sensitivity of this driver stage is so high that it can be used direct with a CD player. Use an 100k ohm pot as volume control. Both the 400V and 700V supplies should be well filtered, maximum ripple 2mV.

You can of course use higher voltage than 700V for better linearity. The EL36 tube can withstand more than 1000V. The 6DN6 tube can also be used for very high operating voltages. Never use more than 1000V B+ supply voltage and be sure to set the anode voltage to 50% of B+ voltage. Use a separate filament supply for V2. Be careful, high voltages are dangerous!

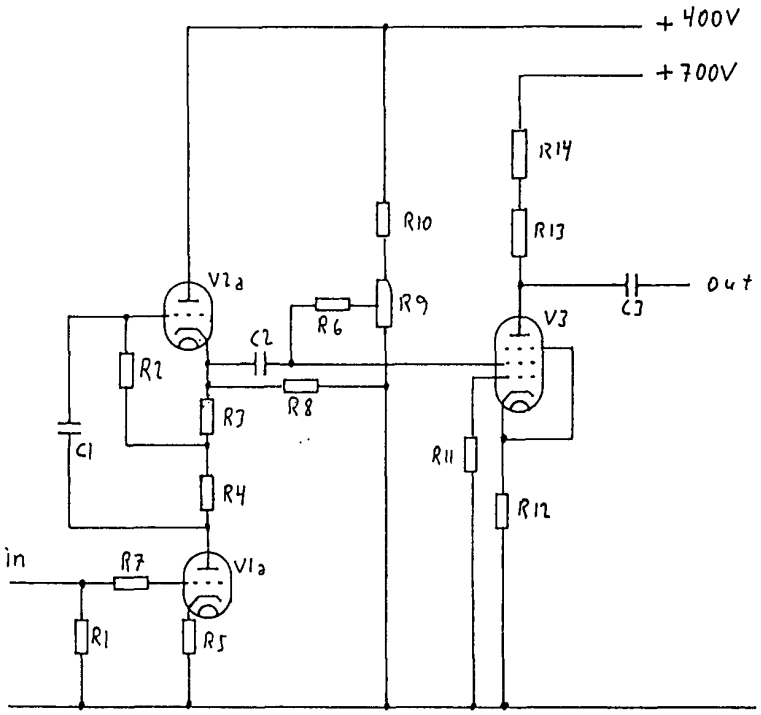

TABLE 1 - Parts List

R1, R6	100k ohm	R12	100 ohm
R5, R7, R11	1k	R13, R14	12k 6W
R2	470k	C10	.10uf 400V P
R3	68k	C2	1uF 400V PP
R4	22k	C3	1uF 630V PP
R8	68k 2W	V1	12AX7/ECC83
R9	50k pot.	V2	12AU7/ECC
R10	150k 2W	V3	see text

TABLE 2 **Distortion for different tubes at V3 measured at 50V RMS output**

V3	Distortion in dB 2nd	3rd	Drive mV for 50V out	Brand
EL34	-46	-43	141	Telefunken
EL36	-47	-74	65	Tungsram
5881	-48	-73	122	Sovtek
6L6GA	-45	-54	144	Tungsram
6AV5GA	-45	-68	82	Sylvania
6DN6	-47	-58	51	G.E.
6CD6GA	-39	-47	68	G.E.