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### A direct coupled, active loaded, parallel feed output SE 45 amplifier

*Design by John Tucker, with contributions by Mike LaFevre, John Camille, and Kim Jenkins.*

*(reprinted from Valve, October 1997)*

Here's a truly delightful amp circuit for owners of truly efficient speakers (see the schematic shown below).

The prototype of this circuit, built at the first amplifier builder's class after VSAC '97, left all in the room at it's debut rather smitten, particularly John Tucker, who currently uses this circuit as his front line amp on his Exemplars.

The midrange is balanced, smooth, and very real. Bass articulation is phenomenal, you would never expect this sound from a puny 45. Top end? How 'bout -1dB at 46kHz, and black as can be?

Downside? Well, it's only 1.6 watts, so you better have some pretty efficient speakers (although Kim Jenkins seems happy with this setup on Whamos).

And it's not a forgiving circuit, if your front end sucks, you'll know it. This amp reveals a great deal of information.

Also, doing it right means it isn't a super cheap project. For best performance you'll want to use nickel core parallel feed output transformers, and proper plate loading chokes. The choice of manufacturers for these items is pretty narrow (said with a big grin). The name of this amp gives about 90% of the circuit's description. Note the use of an active load on the driver stage. This load is quite similar to the one used in the Afterglow circuit, and in concert with the parallel feed output arrangement, accounts for the amp's superior speed and bass response.

You might try this load, with the proper adjustments as outlined in the note on the next page, as a load for your other projects. Try it on the first stage of the 5963 output stage in George Wright's line amp, or on top of the mu follower in the S.E.X. amp (put it in in place of the 20K resistor).

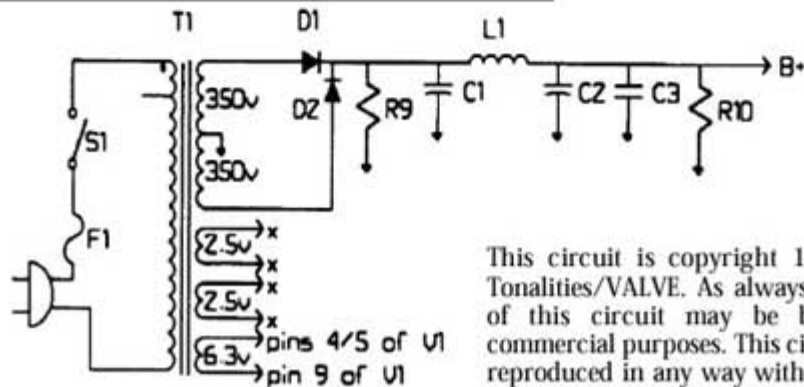
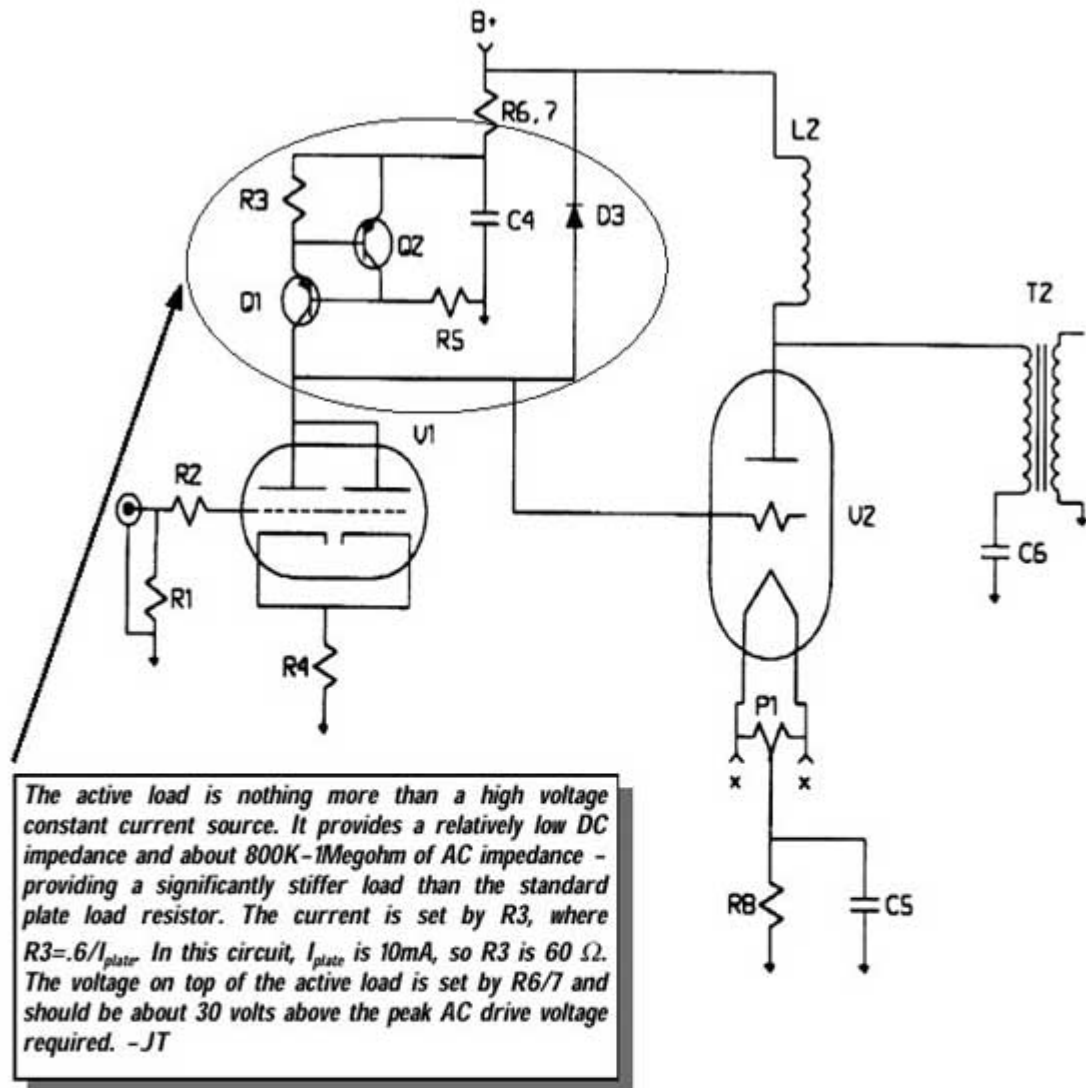
The 45 is running at a classic operating point, 250V plate-to-filament, with -50V grid bias, yielding a 34mA current draw. Note that these voltages are translated up by the plate voltage of the direct coupled driver stage, so actual measured voltage on the plate of the 45 is more like 400V above ground. Man, I

get all tingly just writing about this amp.

Better get started on my own copy!

***Doc B.***

**Direct coupled parallel feed output SE 45 amplifier and power supply - one channel shown.**



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### Direct coupled parallel feed output SE 45 amplifier parts list (for two monoblocks).

Designator	Description	Value	Tol.	Pwr. Vlt.	Qty
C1,C2	Electrolytic Capacitor (Radial)	100 mfd	10%	450V	4
C3	Metallized Polyester Capacitor	1 mfd	10%	630V	2

C4	Metallized Polyester Capacitor	1 mfd	10%	250V	2
C5	Electrolytic Capacitor (Radial)	220 mfd	10%	200V	2
C6	Poly or Oil	10 mfd	10%	400V	2
D1,D2	Fast Recovery/Soft Start Diode	1N4948		1000PIV	4
D3	Diode	1N4007		1000PIV	2
L1	Filter choke	10H 270 ohms		.90mA	2
L2	Plate Load Choke (Brooklyn BCP 15)	40H 550 ohms		.50mA	2
Q1	Transistor, PNP	MJE350			2
Q2	Transistor, PNP	MPS4250			2
P1	Wirewound Potentiometer	50 ohms		.5W	2
R1	Metal Film Resistor	249K ohms	.1%	1/4W	2
R2	Metal Film Resistor	681 ohms	.1%	1/4W	2
R3	Metal Film Resistor	60.4 ohms	.1%	1/4W	2
R4	Metal Film Resistor	174 ohms	.1%	1/4W	2
R5	Metal Film Resistor	100K ohms	.1%	1/4W	2
R6	Metal Oxide Resistor	10K ohms	.5%	3W	2
R7	Metal Oxide Resistor	13K ohms	.5%	3W	2
R8	Wirewound Resistor	4.4K ohms	.5%	10W	2
R9,R10	Carbon Film Resistors (PS bleeders)	270K ohms	.2%	1/4W	2
F1	Fast Blow Fuse	1 amp		250V	2
S1	SPST switch			3A 250V	2
T1	700VCT, 50mADC 6.3V, .5A 2.5V, 1.5A min.				2
T2	300H 5K primary (MagneQuest EXO- 45 or 46)				2
V1	Medium Mu twin triode 5965				2
V2	Low Mu Triode 45				2

Aside from the parafeed iron, most of the parts spec'd are fairly non-critical in terms of manufacture. I changed Smoothplate's spec for the PS bleeders from metal film to carbon film, because I've found they seem to hold up to big startup voltage swings a little better.

Note that the power trans specs are the bare minimum required. Bigger may work better.

Brooklyn BCP-15 plate loading chokes are available for \$100 the pair, and Magnequest EXO-45 (5K:8) and EXO-46 (5K:16) parallel feed output transformers are available for \$150 the pair with M6 steel laminations, and \$250 the pair with Permalloy (nickel) laminations. For a real treat, we also have a couple of pairs of the Permalloy EXO-46s with pure silver secondaries and Teflon coated 'touched by God copper' primaries, for \$650 the pair. Call 360-697-1936 to order any of these goodies.

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