The Electrocompaniet Power Amp.   Sam 8/01

With output of 25W per channel into 8ohms, this power amplifier, presents exceptional interest for many, and it applies enough technological solutions, that we do not find in a lot of other amplifiers.

The circuit is designed with regard to reducing T.I.M (Transient Intermodulation Distortion).

Observing the circuit of amplifier, we will see that it is separated in four stages. The three first are full differential amplifiers (in thermal equilibrium, for minimal change in characteristic with temperature variation) and the fourth stage of the classic Darlington arrangement, with Vbe multiplier transistor so set bias current in the output stage.

In the first differential stage Q1 is BCY87 (Philips), in a metal case. The input impedance R1 of the amplifier is very low 1.8K, compared to most amplifiers which are between 47K-100K.
The two first differential amplifiers are supplied by current sources Q2 and Q3 ZTX384 (Ferranti).
The base of Q1 is applied the negative feedback via R18, R2, R4. Compensation for high frequencies is provided by R5 and C2.

In the second differential stage Q4- BCY89 (Philips), trimmer TR1, adjusts for output offset voltage. The constant current sources are roughly 0.2mA for first stage and 0.4mA for second stage.

The third differential stage Q5-Q6, is supplied with current from current mirror Q8-Q9. These function to increase the speed and the linearity of stage. Thermal balance is ensured as Q5, 6, 8, 9 are all in thermal contact.

Q7 and TR2 are a Vbe multiplier, in thermal contact with the output stage

The output stage is the classic Darlington pair for positive and negative supplies. D4 & D5 protect the output transistors from speaker back emf.

A other point of difference is the driver stags are supplied with non symmetrical regulated power supplies of +19V and -44V and the final stage with and unregulated +/- 26V. This segregation of power supplies improves the Power Supply rejection ratio for low noise and decreases the intermodulation and the distortion.

R1-3-19= 1.8Kohms	R24-31= 2.2Kohms	D1= 15V 0.5W Zener
R2= 10 ohms	R25= 2.7Kohms	D2-3= 1N4148
R4= 12Kohms	R28-29= 10 ohms	D4-5= BY206
R5= 120 ohms	R32-33= 56 ohms	Q1= **BCY87** (Philips)
R6-7-27= 1Kohms	R34-35= 1 ohms/5W	Q2-3= ZTX384 (Ferranti)
R8-13= 2.7Kohms	R36-37= 1 ohms/5W	Q4= **BCY89** (Philips)
R9-10= 1Kohms	R38= 1 ohms/ 3W	Q5-6= **BD140**
R11-12= 33 ohms	C1-6-7= 100nF 100V Polyester	Q7-8-9= **BD139**
R14-15-20-21= 10 ohms	C4-5= 680nF 100V Polyester	Q10= BD139
R16= 3.3Kohms	C2= 2.2nF 100V Polyester	Q11= BD140
R17= 4.7Kohms	C3= 2.5nF 100V Polyester	Q12-13= **BD203**
R18-26= 470 ohms	TR1= 220 ohms Trimmer	Q14-15= **BD204**
R23-30= 1 ohm	TR2= 1Kohms Trimmer	All R is metal film 1% except R34-38

SPECIFICATIONS	
OUTPUT POWER	25W/8 ohm - 40W/4 ohm
DAMPING FACTOR	160 [8 ohm]
INPUT IMPEDANCE	1Kohm
SLOW RATE	125V/µs
FREQUENCY RESPONSE	1W/8 ohm DC-1MHZ
THD	0.01% 12.5W
TIM	0.03% 12.5W
S/N	100dB