

R.C. coupled amplifiers or phase splitters can conveniently be built around a high- μ double triode with separate cathodes such as the ECC 83. The amplification factor of this tube is 100, so that adequate gain can be obtained in the cathode-coupled type of phase splitter used for the AMPEREX-designed 5-tube 10-W amplifier and the 20-W amplifier using 6CA7 output tubes.

HEATER

Can operate with other tube filaments in series or parallel, A.C. or D.C.

The heater is center-tapped and the two sections may be operated in series or in parallel.

Series: Filament voltage applied between pins 4 and 5.

Parallel: Filament voltage applied between pin 9 and pins 4 and 5 connected together.

	Series	Parallel	
Filament Voltage	12.6	6.3	V
Filament Current	0.15	0.3	A

CHARACTERISTICS (each section)

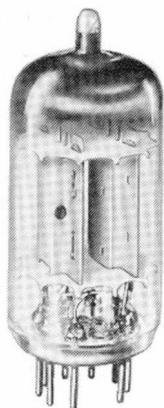
Plate Voltage	100	250	V
Plate Current	0.5	1.2	mA
Grid No. 1 Voltage	-1.0	-2.0	V
Transconductance	1250	1600	micromhos
Amplification Factor	100	100	
Plate Resistance	80	62.5	K Ω

DESIGN CENTER MAXIMUM (each section)

Plate Voltage	300	V
Plate Dissipation	1.0	W
Cathode Current	8.0	mA
Grid Resistance**	2	M Ω
Filament to Cathode Voltage	180	V
Filament to Cathode Resistance††	20	K Ω

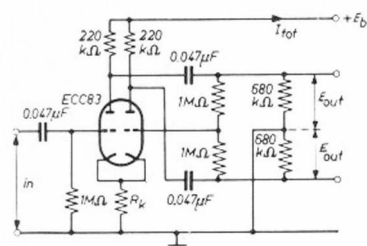
**With grid current biasing max. grid resistance = 22 M Ω .

††When used as a phase inverter immediately preceding the output stage, filament to cathode resistance max. may be 150 K Ω .

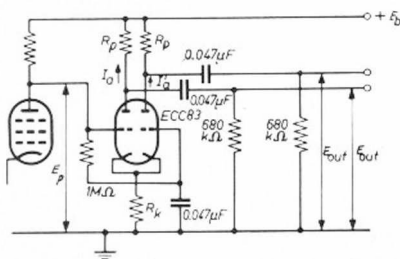


ECC83

(12AX7)



Circuit A



Circuit B

TYPICAL OPERATING CONDITIONS

Operating Conditions as R. C. Coupled A. F. Amplifier (with cathode bias)

E_b (V)	R_p (k Ω)	I_k (mA)	R_k (Ω)	Voltage Gain	E_o^* (V_{rms})	d_{tot}^* (%)	R_{g1}^\ddagger (k Ω)
400	47	2.45	680	44	37	3.6	150
350	47	1.98	820	42.5	33	4.4	150
300	47	1.55	1000	40	26	5.0	150
250	47	1.18	1200	37.5	23	7.0	150
200	47	0.86	1500	34	18	8.5	150
400	100	1.72	820	63	38	1.7	330
350	100	1.40	1000	61	36	2.2	330
300	100	1.11	1200	57	30	2.7	330
250	100	0.86	1500	54.5	26	3.9	330
200	100	0.65	1800	50	20	4.8	330
400	220	1.02	1200	76.5	38	1.1	680
350	220	0.85	1500	75.5	37	1.6	680
300	220	0.63	2200	72	36	2.6	680
250	220	0.48	2700	66.5	28	3.4	680
200	220	0.36	3300	56	24	4.6	680

*Output voltage and distortion at start of positive grid current. At lower output voltages the distortion is approximately proportional to the voltage.

†Grid resistor of following tube.

Typical Operating Conditions as a Phase Inverter

CIRCUIT A

E_b (V)	I_{tot} (mA)	R_k (Ω)	E_o^* (V_{rms})	Voltage Gain	d_{tot}^* (%)
250	1.08	1200	35	58	5.5
250	1.08	1200	7	58	1.1
350	1.7	820	45	62	3.5
350	1.7	820	7	62	0.7

CIRCUIT B

E_b (V)	$\ddagger E_p$ (approx.) "V"	$I_p + I_p$ (mA)	R_k (k Ω)	R_p (k Ω)	E_o^* (V_{rms})	Voltage Gain	d_{tot}^* (%)
250	65	1.0	68	100	20	25	1.8
250	65	1.0	68	100	9	25	0.6
350	90	1.2	82	150	35	27	1.8
350	90	1.2	82	150	10	27	0.5

*Output voltage and distortion at start of positive grid current. At lower output voltages the distortion is approximately proportional to the voltage.

†(Approx) E_p should be adjusted so that $I_p + I_p' = 1.0\text{mA}$ at $E_b = 250\text{V}$ and 1.2mA at $E_b = 350\text{V}$.

NOTES

MICROPHONICS The tube can be used without special precautions against microphonic effect in amplifiers in which the input voltage is higher than 50 millivolts when the tube is mounted in the near vicinity of a 5 watt loud speaker with an acoustical efficiency of 5%.

HUM The hum and noise level will be better than -60 db when the grid circuit impedance is less than 0.5 megohms (at 60 cps), the center tap of the heater is grounded and the cathode resistor is decoupled by a capacitor of at least 100 μf .