



The textbook Grounded Cathode Amplifier. The most common and easiest of tube circuits. The triode is cathode biased. The output is phase inverted. The gain never exceeds the μ of the triode. Still, a very good line stage can be made from this circuit.

Tube

Tube = 12AX7
 Number = 1
 μ = 100
 g_m = 1.6 ma/v
 r_p = 62500 ohm
 I_{max} = 2.5 ma
 V_{max} = 300 v
 W_{max} = 1 w
 C_{gp} = 1.7 pf

Circuit Setup

R_k = 470 ohm
 R_k bypassed
 R_{in} = 1 k
 R_L = 100 k
 R_a = 4.7 k
 Cap = 1 μ f
 I = 1.3ma
 V_{B+} = 110v

AC Results

Gain = 6.7	Gain dB = 16.5 dB
Phase = inverts	PSRR = -1 dB
Z input = 411 k	Z output = 4.19 k
F -3dB low = 1.53 hz	F -3dB high = > 1 mhz

DC Results

V_{tube} = 103 v	V_{Ra} = 6.11 v
V_{bias} = -0.63 v	$V_g DC$ = 0 v
V_{th} = 0.87 v	$V_{max out}$ = -2/+5.84 v
Plate Dis. = 134 mw	Total Dis. = 143 mw
R_a Dis. = 8 mw	W_{Rk} = 1 mw

Calculated Part Values

R_k = 475 ohm	Cap R_k = 30 μ f
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