



The textbook Totem Pole amplifier. Very popular. This circuit seems to promise it all. Low distortion, low Z_o , high gain. It works by using a top triode as a current source and a cathode follower at the same time. Resistors R1 and R2 set up the bias voltage for the top triode.

Tube

Tube = 12AT7
 Number = 1
 $\mu = 60$
 $g_m = 4 \text{ ma/v}$
 $r_p = 15000 \text{ ohm}$
 $I_{max} = 25 \text{ ma}$
 $V_{max} = 300 \text{ v}$
 $W_{max} = 2.5 \text{ w}$
 $C_{gp} = 1.5 \text{ pf}$

Circuit Setup

$R_k = 100 \text{ ohm}$
 R_k bypassed
 $R_{in} = 1 \text{ k}$
 $R_L = 220 \text{ k}$
 $R_a = 3.3 \text{ k}$
 $Cap = 0.1 \mu\text{f}$
 $I = 5 \text{ ma}$
 $V_{B+} = 220 \text{ v}$

AC Results

Gain = 54.96
 Phase = inverts
 $Z_{input} = 96.5 \text{ k}$
 $F_{-3dB \text{ low}} = 7.2 \text{ hz}$
 $Gain \text{ dB} = 34.8 \text{ dB}$
 $PSRR = -22.7 \text{ dB}$
 $Z_{output} = 1.18 \text{ k}$
 $F_{-3dB \text{ high}} = > 1 \text{ mhz}$

DC Results

$V_{tube} = 102 \text{ v}$
 $V_{bias} = -0.44 \text{ v}$
 $V_{th} = 2.72 \text{ v}$
 Plate Dis. = 508 mw
 $R_a \text{ Dis.} = 82 \text{ mw}$
 $V_{Ra} = 16.5 \text{ v}$
 $V_{g2} = 118 \text{ v}$
 $V_{max \text{ out}} = -24/+149 \text{ v}$
 Total Dis. = 1.1 w
 $W_{Rk} = 3 \text{ mw}$

Calculated Part Values

$R_k = 88.7 \text{ ohm}$
 $R_1 = 1.02 \text{ m}$
 $Cap_{Rk} = 111 \mu\text{f}$
 $R_2 = 1.18 \text{ m}$