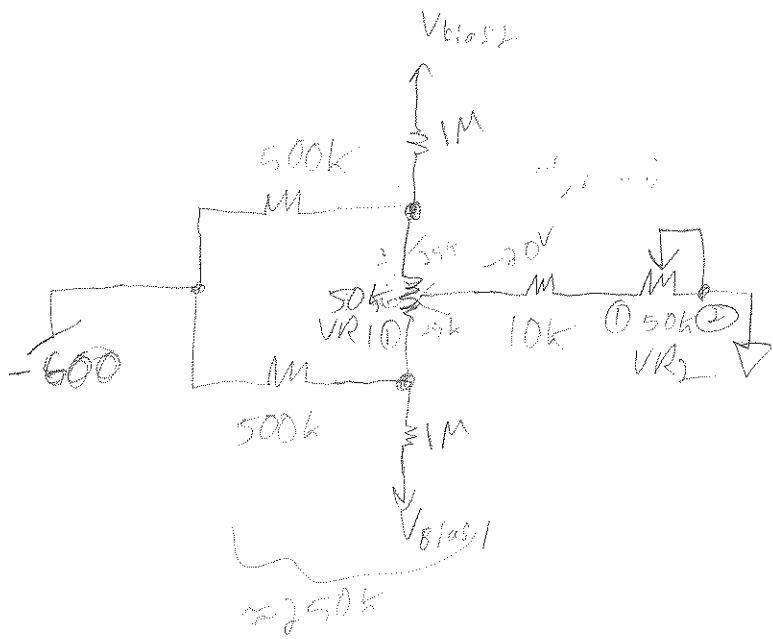
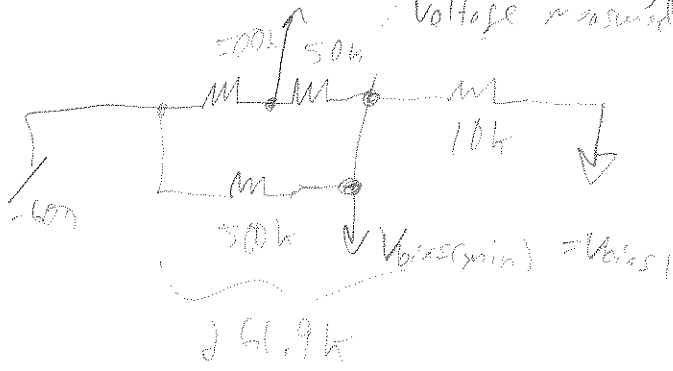


# Frankenstein Mik 2 Quad 40 Bias Circuit Design Notes

-600V, -20 to -100V bias, 50k pot

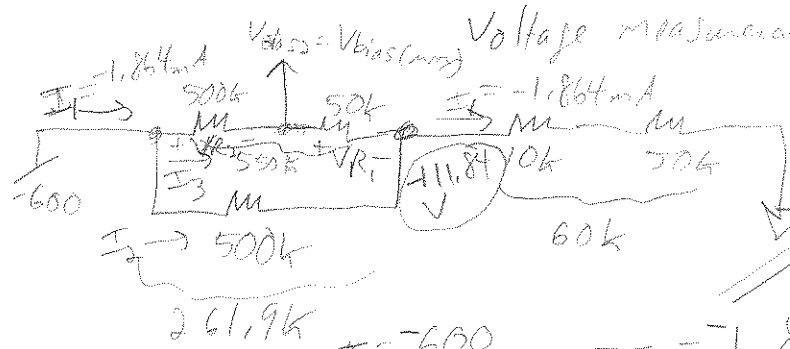


Min voltage: VR2 wiper at ①, VR1 wiper at ①, voltage measured at Vbias1



$$V_{Bias(min)} = -22.07 V$$

Max Voltage: VR1 wiper at ①, VR2 wiper at ②, voltage measured at Vbias2



$$V_{R1} = -0.887(50k) = -44.35$$

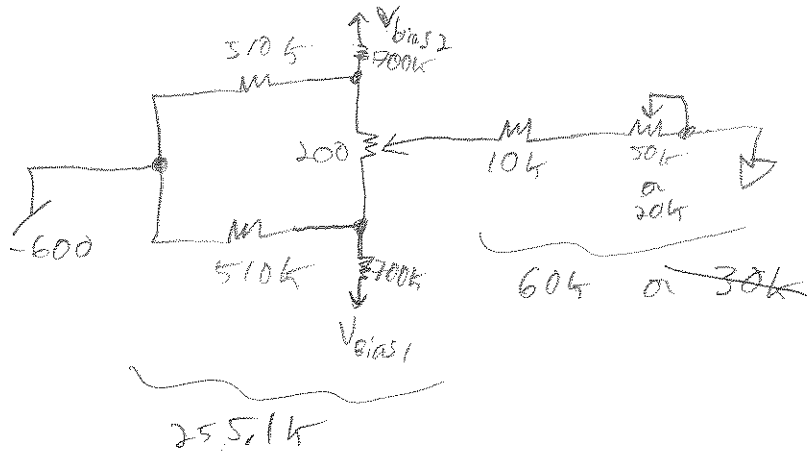
$$V_{R2} = -0.887(500k) = -442.5$$

$$V_{Bias(max)} = -111.84 - 44.35 = -156.19$$

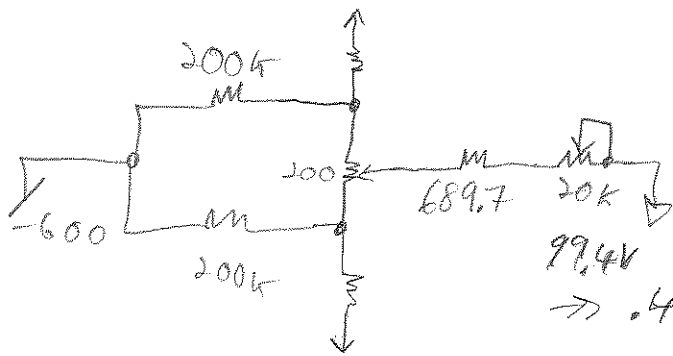
$$I_1 = \frac{-600}{261.9k + 60k} = -1.864 mA$$

$$I_2 = (-1.864 mA) \frac{1}{\frac{1}{500k} + \frac{1}{500k}} = -0.887 mA$$

$$I_3 = (-1.864 mA) \frac{1}{\frac{1}{500k} + \frac{1}{500k}} = -0.976 mA$$



114.2 V or ~~63.13~~

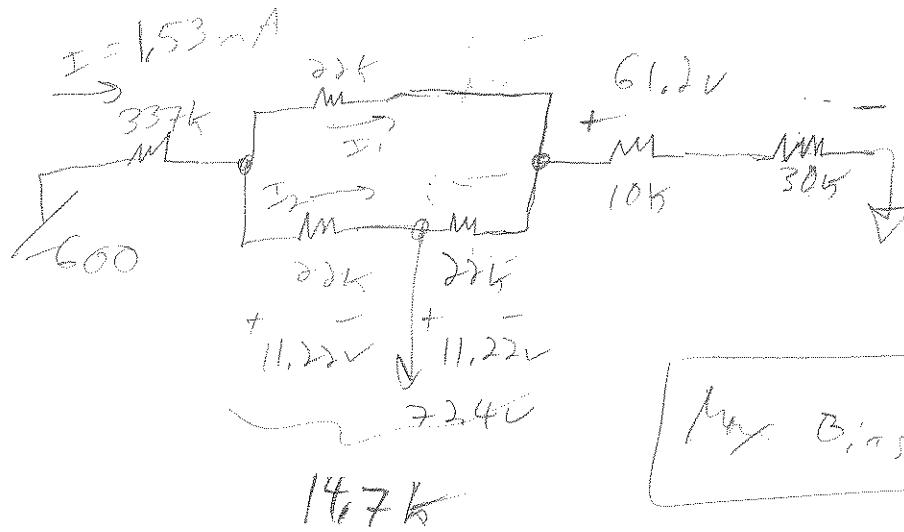


$V = IR$

4.97 mA

$\rightarrow 0.49 \mu W$  across  
 the  $20k$  pot

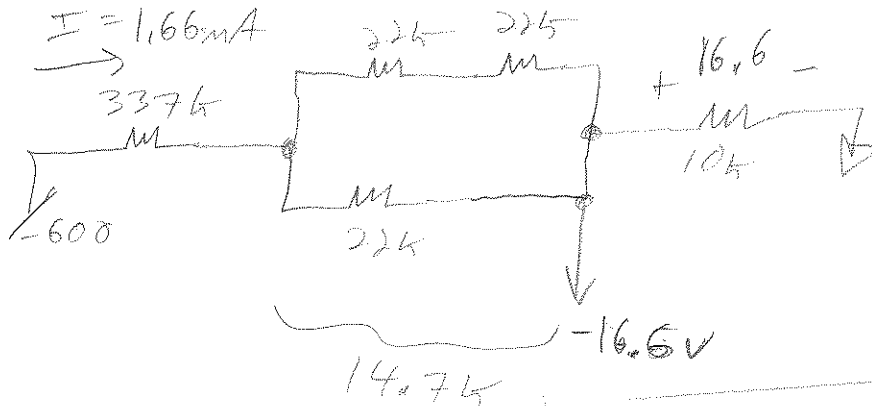
# Max Bias



Max Bias =  $-72.4 \text{ V}$

$$I_2 = (1.53 \text{ mA}) \frac{1}{\frac{1}{44 \text{ k}} + \frac{1}{22 \text{ k}}} = 0.51 \text{ mA}$$

# Min Bias

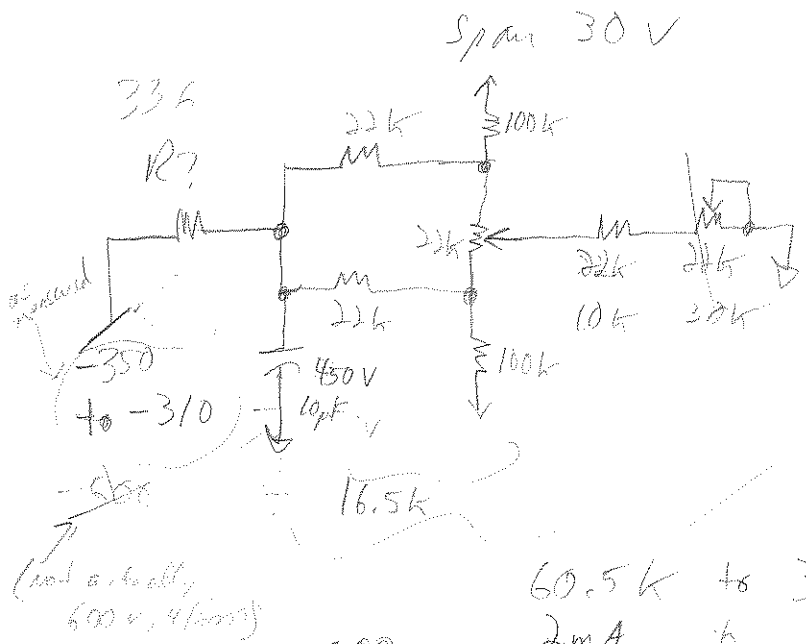


Min Bias =  $-16.6 \text{ V}$

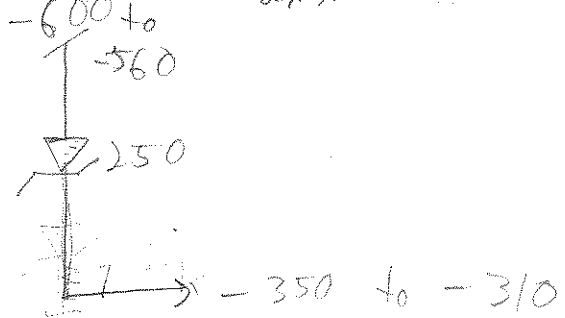
$20\text{ mA} \rightarrow -54\text{ V}$   
 $100\text{ mA} \rightarrow -38\text{ V}$

design for:  
 $-61\text{ V to } -31\text{ V}$

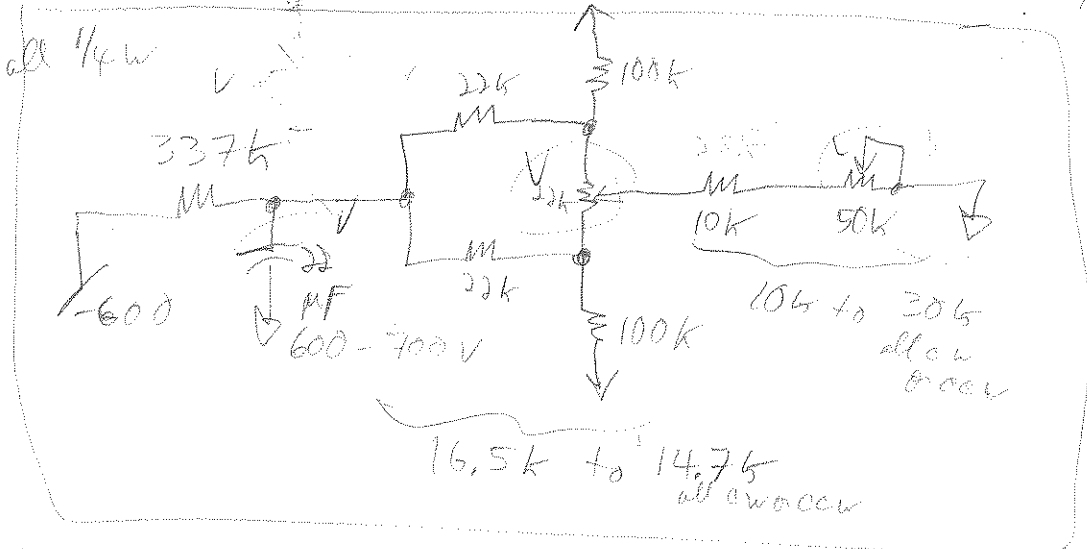
$\Delta V = 16\text{ V}$   
 $\text{cata} = -46\text{ V}$



$60.5\text{ k to } 38.5\text{ k}$   
 $2\text{ mA to } 3.1\text{ mA}$



$\checkmark$  wire ties  
 $\checkmark$  supply caps  $\times 4$   
 $470\mu\text{F } 350\text{V}$



Final Bias Design  
 for Quad-40