Rako Engineering

Capacitor discharge worksheet

Parameters	Value	Unit			
Capacitor Charged Voltage	180	V			
Capacitor Value	0.01	F			
Number of Capacitors in parallel	3	each			
Resistor Value	33000	Ohm			
Number of resistors in parallel	6	each			
Avg current through one resistor	0.0027	A			
Peak current through one resistor*	0.0055	A			
Peak power dissipated through each resistor*	0.9818	W			
Average current through all resistors	0.0164	A			
Peak current through all resistors*	0.0327	A			
Peak power dissipated though all resistors*	5.8909	W			
Time to discharge to 10V	311.667	s	=	5.194	minutes
Time to discharge to 0V	330.000	s	=	5.500	minutes

Note: * = Peak as in the beginning of power down procedure.
Note: * = Peak would be the acutal current/power during operation

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Capacitor Charged Voltage	180	V			
Capacitor Value	0.01	F			
Number of Capacitors in parallel	3	each			
Resistor Value	33000	Ohm			
Number of resistors in parallel	3	each			
Avg current through one resistor	0.0027	A			
Peak current through one resistor*	0.0055	A			
Peak power dissipated through each resistor*	0.9818	W			
Average current through all resistors	0.0082	A			
Peak current through all resistors*	0.0164	A			
Peak power dissipated though all resistors*	2.9455	W			
Time to discharge to 10V	623.333	s	=	10.389	minutes
Time to discharge to 0V	660.000	s	=	11.000	minutes

Note: * = Peak as in the beginning of power down procedure.
Note: * = Peak would be the acutal current/power during operation

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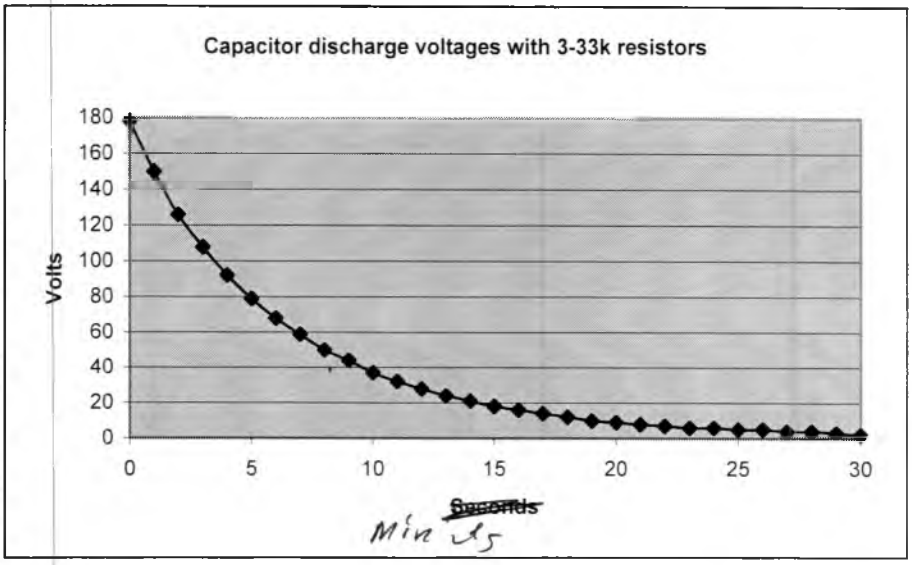
Actual Test data for discharging capacitors

Seconds	Volts
0	178
1	150
2	126
3	108
4	92
5	79
6	68
7	59
8	50
9	44
10	37
11	32
12	28
13	24
14	21
15	18
16	16
17	14
18	12
19	10
20	9
21	8
22	7
23	6
24	6
25	5
26	5
27	4
28	4
29	3
30	2



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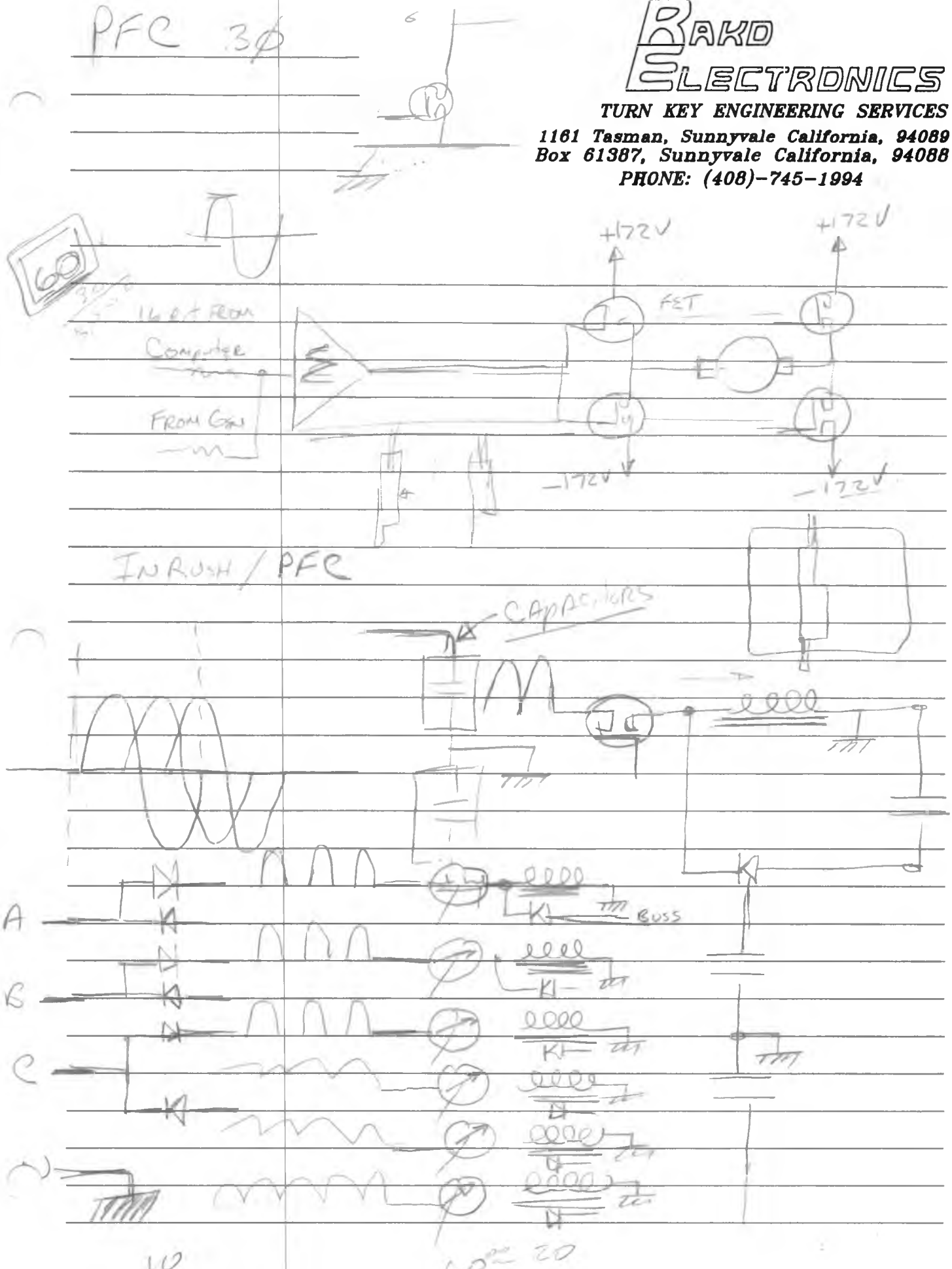
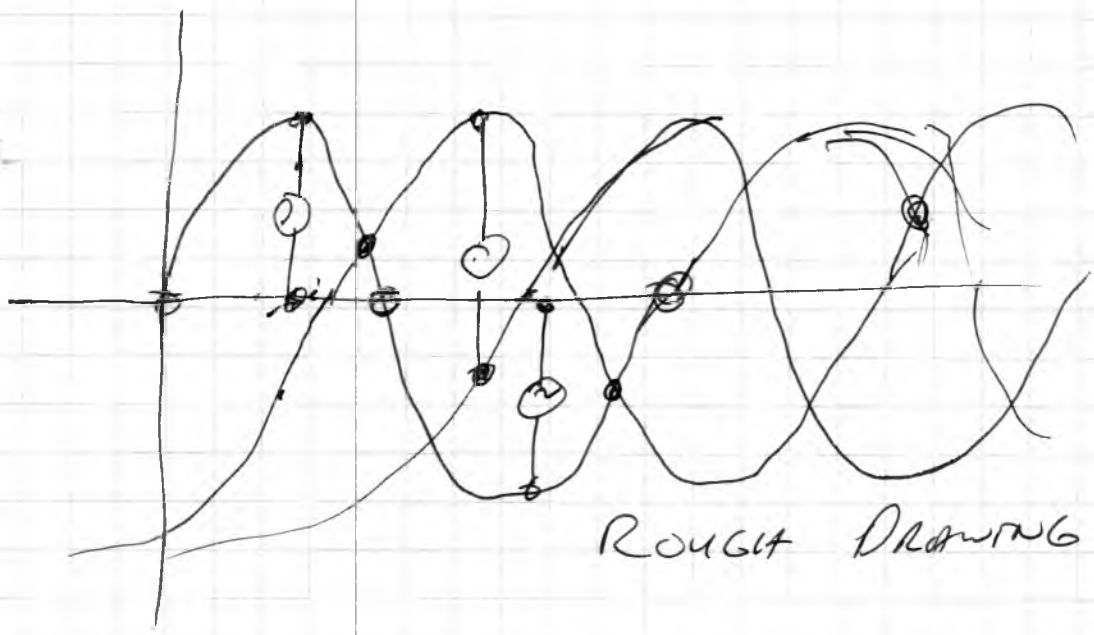


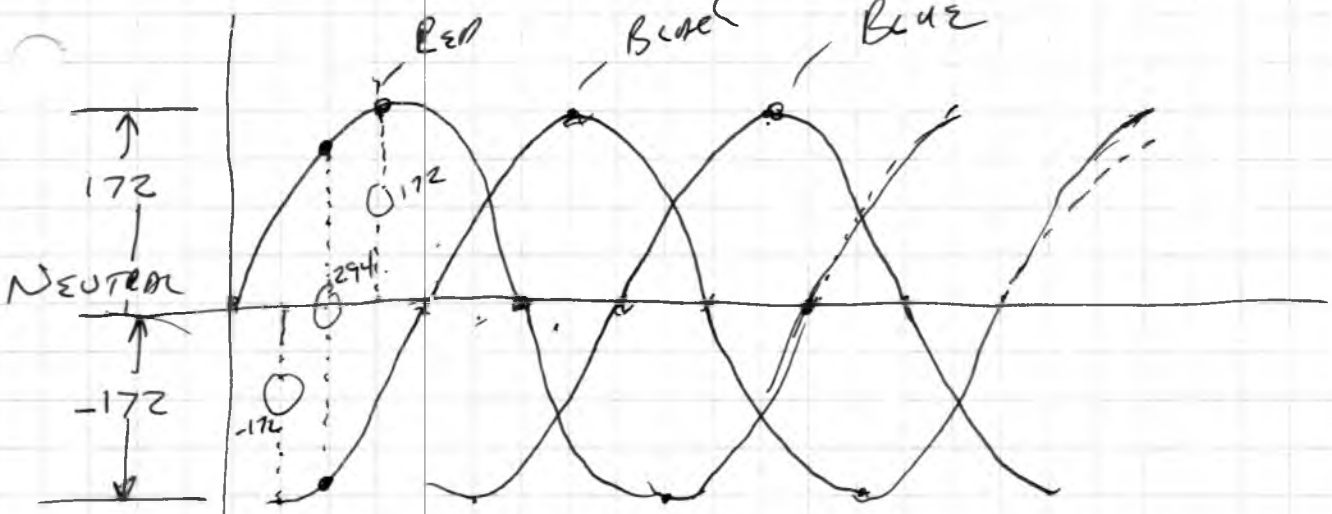


ROUGH DRAWING

BETTER DRAWING

120 V_{RMS} = ±170 V_{p-p}

208 V_{RMS} = ±294 V_{pp-}



$$\frac{208}{120} = 1.733 = \frac{294}{170}$$

if 120 ≡ 4 squares on graph

4(1.733) = 6.93 squares on Graph -

Yup - checks out.