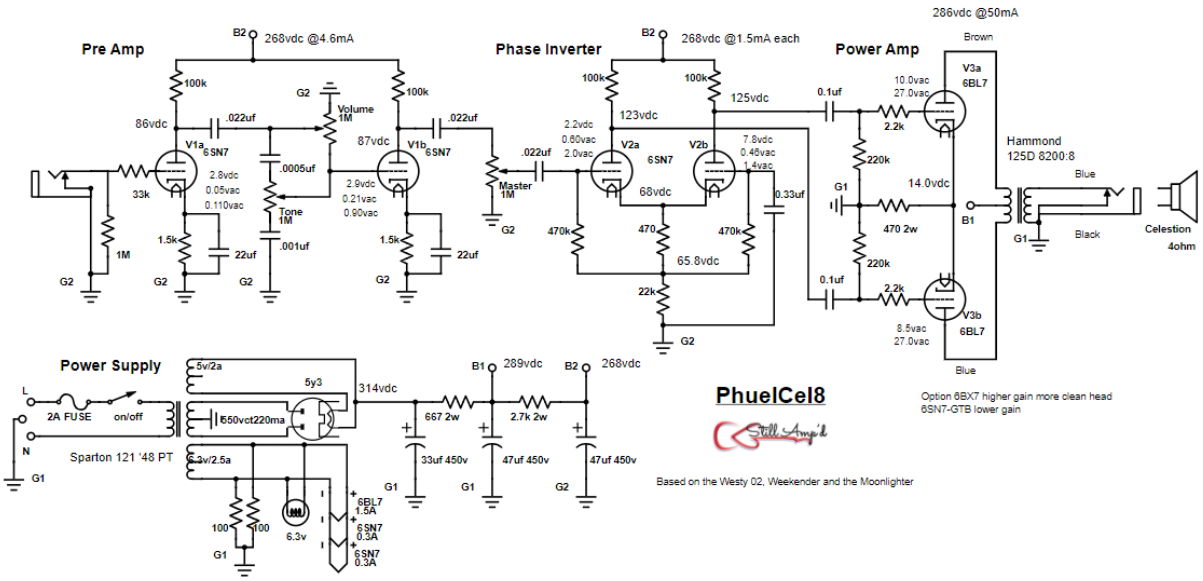
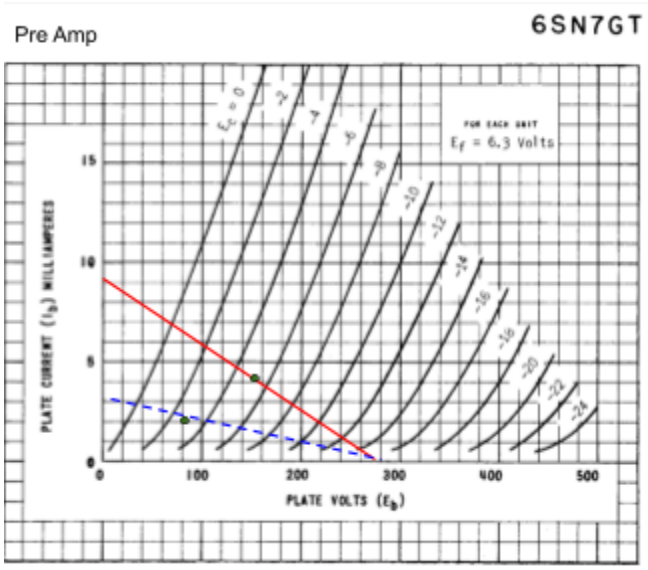
PhuelCel8



PreAmp Design



Pre Amp Case 1
Ra = 270v/9ma = 30k ohm (red line)

With original 100k Iplate = 3ma (blue line)
R_{bias} = 3v/2ma = 1.5k

Bias center = -5v; V=155v; I=4.1ma
Rb=5/4.1ma = 1.22k ohms

Bias = -6v, V=160, I=3.7ma
Rb = 6/3.7ma = 1.62k ohms

Bias = -7v; V=175, I=3ma
Rb = 7/3ma = 2.33k ohms

Pre Amp Change:
Change Ra from 100k to 30k ohm V= 155vdc (green dot); 55% of supply
Leave Rb at 1.5kohms; bias ~ 5.7v/3.8ma

Stage Two
Same design as Preamp

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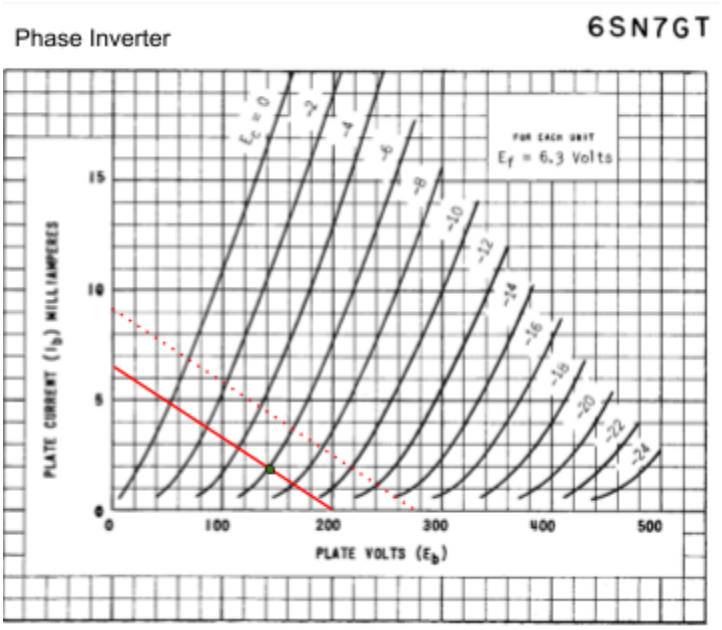
Phase Inverter



Case 1
B2 = 270v
V_{tail} = 70v (26% of B2)
V_{triode} = 200v
I_{triode} = 6.5ma
R_{plate} = 200v/6.5ma = 30.8kohm

Bias
V_{bias} = -6v
I_{bias} = 2ma
R_{bias} = 6v/(2*2ma) = 1.5kohm

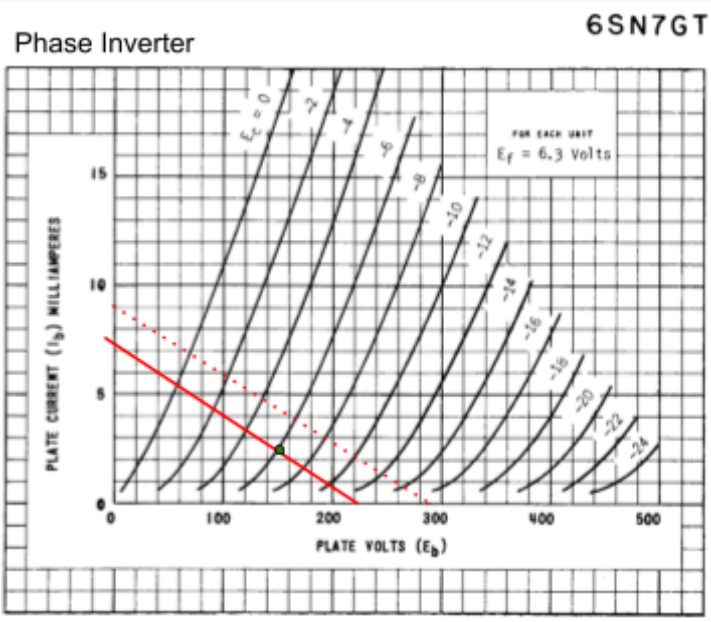
Tail
R_{tail} = (70v-6v)/(2*2ma) = 16kohms

Conclusion:
Change Ra from 100k to 30k ohm V= 160vdc
Change Rb from 470 to 1500ohms
Change R_{tail} from 22k to 16kohm

Phase Inverter Case 2
B2 = 290v; 9ma 6SN7 typical spec
V_{tail} = 70v (24% of B2)
V_{triode} = 220v
I_{triode} = 7.5ma
R_{plate} = 220v/7.5ma = 29.3kohm

Bias
V_{bias} = -6v
I_{bias} = 2.5ma
R_{bias} = 6v/(2*2.5ma) = 1.2kohm

Tail
R_{tail} = (70v-6v)/(2*2.5ma) = 12.8kohms



Phase Inverter Conclusion:
Change Ra from 100k to 30k ohm V= 150vdc (green dot); 68% of supply (150/220)
Change Rb from 470 to 1.2kohms; Vbias = -6v
Change R_{tail} from 22k to 12.8kohm; Vtail = 64v

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Power Stage

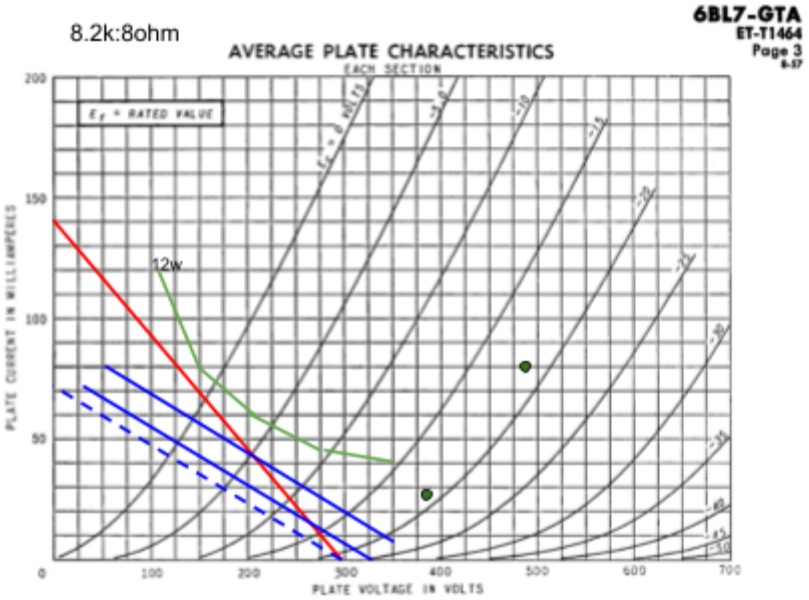
Case 1 - 8.2kohm (125D 2&5)
B1 = 290vdc

I_{classA} = 290v/(8200/2) = 70.7ma
I_{classB} = 290v/(8200/4) = 141.5ma

Bias =-14v; R_{bias} = 14v/15ma = 933ohm
Power = 260v*15ma = 3.9w

Bias = -5v; Rbias = 5v/45ma = 111ohm
Power = 200v*45ma = 9w

14-x/14-5 = 933-470/933-111
14-x=9*463/822
x=14-9*463/822 = 8.9v



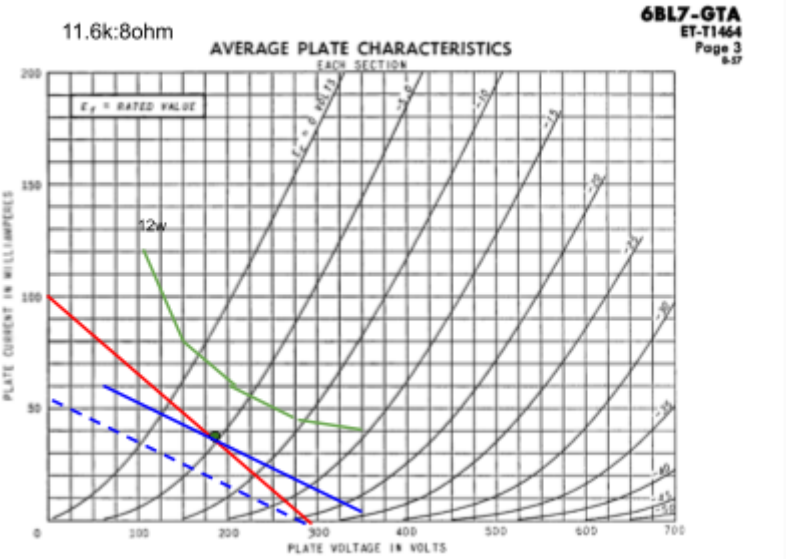
Case 2 - 11.6kohm (125D 1&4)
B1 = 290vdc

I_{classA} = 290v/(11600/2) = 55.8ma
I_{classB} = 290v/(11600/4) = 100ma

Bias = -5v; Rbias = 5/35ma = 142ohms
Power = 285v*35ma = 10w

Bias -10v, Rbias =10/20ma = 500ohms
Power = 182*35ma = 6.4w

Bias = -14v; Rbias = 14/12ma = 1166ohms
Power = 282v*12ma = 3.4w



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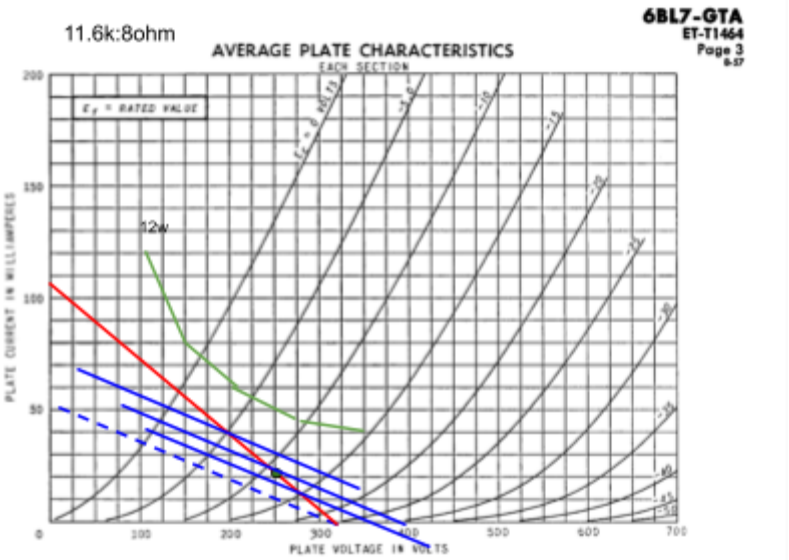

Power Stage Case 3 -
R ot = 11.6kohm (125D 1&4)
B1 = 315vdc

I_{classA} = 315v/(11600/2) = 54.3ma
I_{classB} = 315v/(11600/4) = 108.6ma

Bias = -5v; Rbias = 5/40ma = 125ohms
Power = 200v*40ma = 8w

Bias =-10v; Rbias = 10/25ma = 400ohms
Power = 240v*25ma = 6w

Bias = -15v Rbias = 15/12ma = 1250ohms
Power = 275v*12ma = 3.3w

Power Stage Conclusion -
apply B1a 315v to plate
Use 1&4 from 125D for 11.6k:8ohm
Keep Rbias at 470ohms for Vbias = -10.4v;