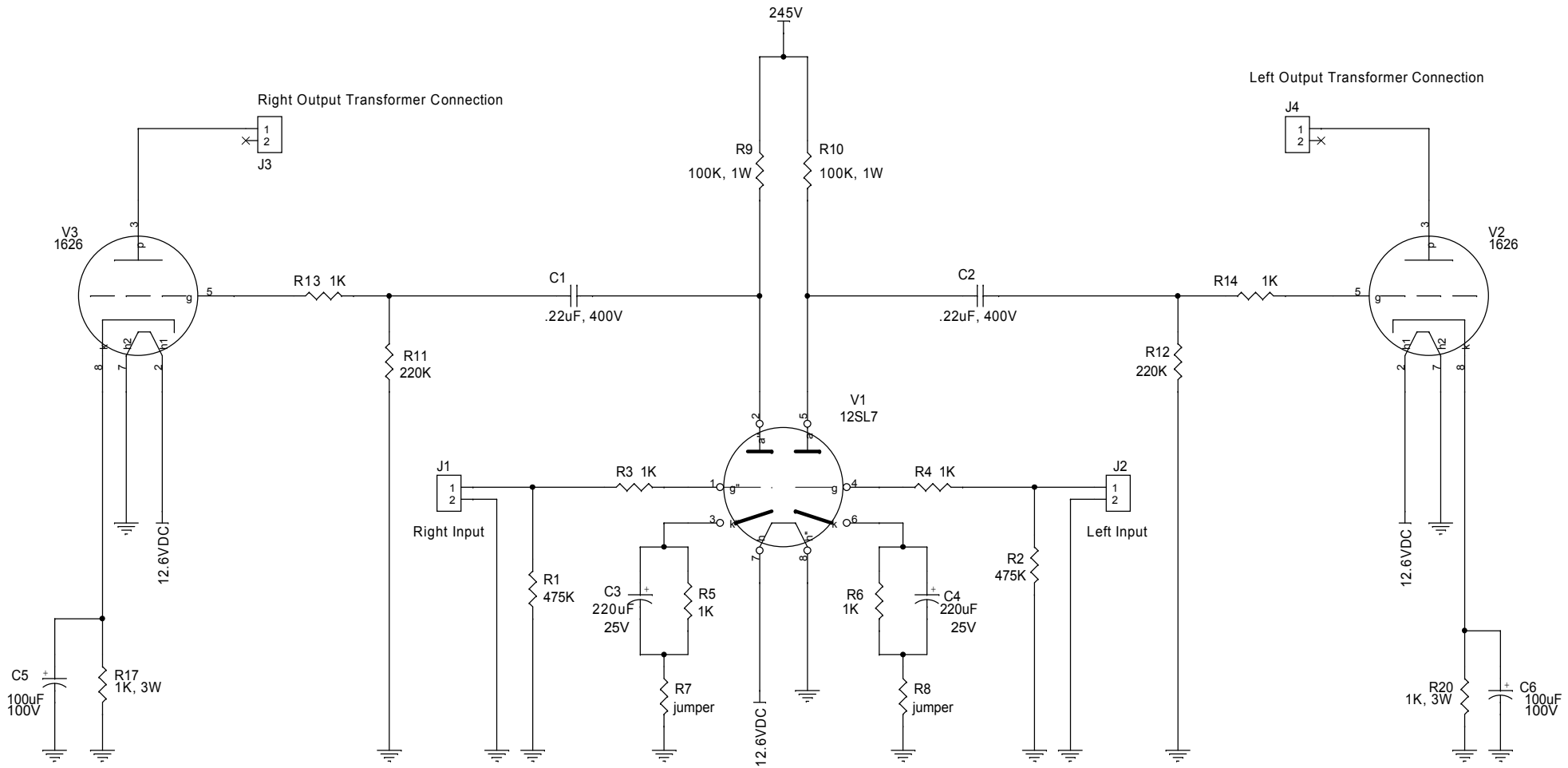

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Size: Custom	Document Number: <Doc>	Rev: -
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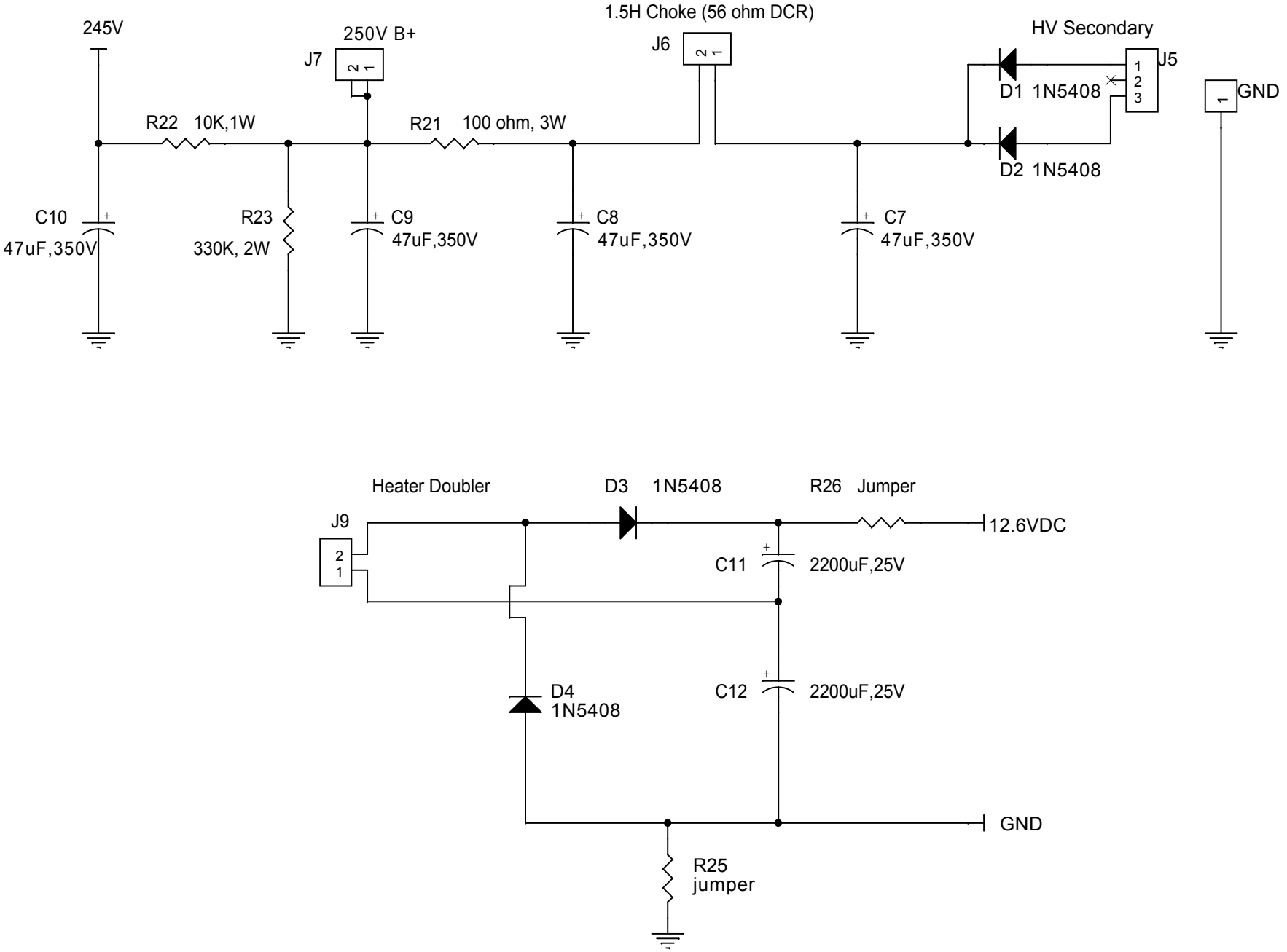

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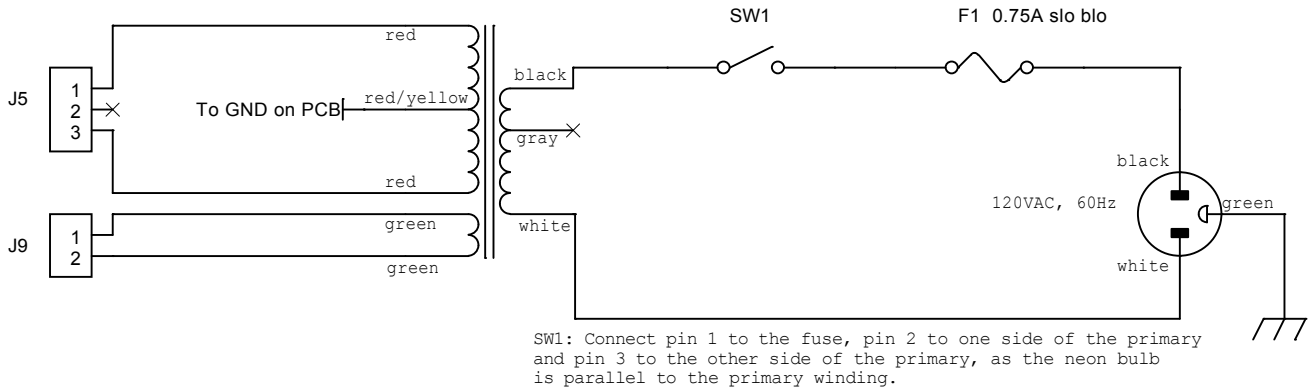
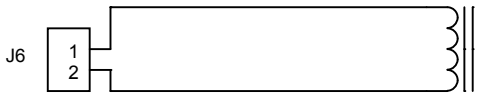
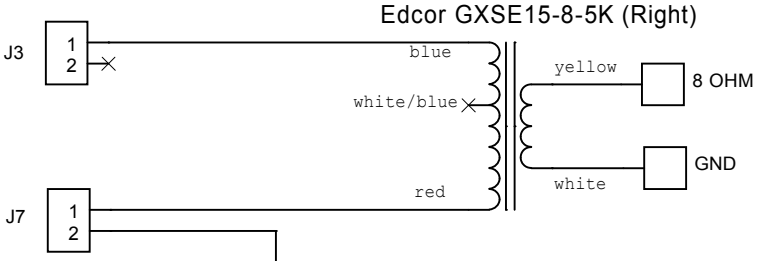
Hammond 269EX, 380VCT



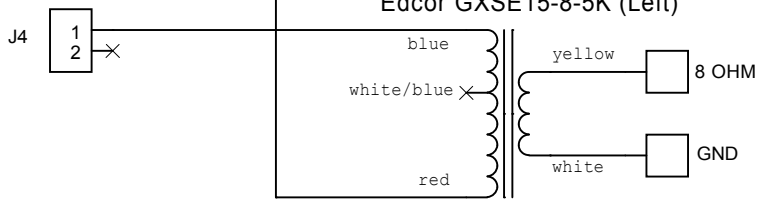
SW1: Connect pin 1 to the fuse, pin 2 to one side of the primary and pin 3 to the other side of the primary, as the neon bulb is parallel to the primary winding.

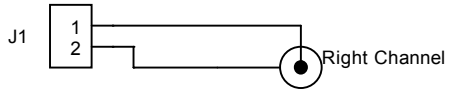


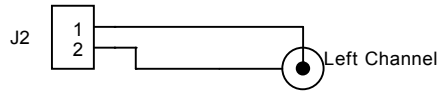
Edcor GXSE15-8-5K (Right)



Edcor GXSE15-8-5K (Left)







J1-1 Right Input +
J1-2 Right Input -

J2-1 Left Input +
J2-2 Left Input -

J3-1 Right Output Transformer Plate (blue)
J3-2 No connection

J4-1 Left Output Transformer Plate (blue)
J4-2 No connection

J5-1 Red Secondary
J5-2 No connection
J5-3 Red Secondary
Important: Solder secondary center tap to GND eyelet by J5 & J7.

J6-1 To Choke
J6-2 From Choke

J7-1 Right Output Transformer B+ (red)
J7-2 Left Output Transformer B+ (red)

J9-1 Filament Tap
J9-2 Filament Tap

Clementine Darling Parts List

D1-D4	1N5408 Diode 1000V,3A	512-1N5408	0.25
C1,C2	.22uF, 400V	75-715P400V0.22	1.45
C3,C4	220uF, 25V	647-UVZ1E221MPD	0.22
C5,C6	100uF, 100V	647-UVZ2A101MPD	0.50
C7-C10	47uF, 350V (25mm by 30mm max) (subs: 667-EEU-EE2V470S,667-EEU-EB2V470,667-EEU-EB2V470S)	667-EEU-EE2V470	1.71
C11,C12	2200uF, 25V	647-UVZ1E222MHD	0.77
R1,R2	475K, 1/2W	71-CMF60475K00FHEK	0.16
R3,R4,R5,R6,R13,R14	1K, 1/2W	71-CMF601K0000FHEK	0.16
R7,R8,R25	jumper		
R9,R10	100K, 1W	281-100K-RC	0.13
R11,R12	221K, 1/2W	71-CMF60221K00FHEK	0.16
R17,R20	1K, 3W	72-RWM410-1K-5	0.59
R21	100, 3W	72-RWM410-100-5	0.63
R22	10K, 1W	281-10K-RC	0.13
R23	330K, 2W	282-330K-RC	0.19
R26	jumper		
Not used: R15,R16,R18,R19,R24,R27,R28			
J1,J2,J3,J4,J6,J7,J9	Terminal Blocks 5.08MM 2P	571-2828372	0.41
J5	Terminal Blocks 5.08MM 3P	571-2828373	1.11
Not used: J8,J10,J11			

****

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Total is $22.36 on 7/17/2011.

512-1N5408 4

75-715P400V0.22 2
647-UVZ1E221MPD 2
647-UVZ2A101MPD 2
667-EEU-EE2V470 4
647-UVZ1E222MHD 2

71-CMF60475K00FHEK 2
71-CMF601K0000FHEK 6
281-100K-RC 2
71-CMF60221K00FHEK 2
72-RWM410-1K-5 2
72-RWM410-100-5 1
281-10K-RC 1
282-330K-RC 1

571-2828372 7
571-2828373 1

VOLTAGE CHART

- **DC measurements (unless noted)**
  - **Shorted input, no signal**
  - **All measurements +/-5%**

V1	**12SL7**
PIN#	
1	0V
2	125V
3	1.0V
4	0V
5	125V
6	1.0V
7	12.6V
8	0V

V2,V3	**1626**
PIN#	
1	0V
2	0V
3	239V
4	0V
5	0V
6	0V
7	12.6V
8	24V

J1-1	0V	Right Input +
J1-2	0V	Right Input -
J2-1	0V	Left Input +
J2-2	0V	Left Input -
J3-1	239V	Right Output Transformer Plate (Edcor GXSE blue wire)
J3-2	0V	No connection
J4-1	239V	Left Output Transformer Plate (Edcor GXSE blue wire)
J4-2	0V	No connection
J5-1	200VAC	Red Secondary
J5-2	-	No connection (floating)
J5-3	200VAC	Red Secondary

Important: Solder secondary center tap to **GND** eyelet by J5 & J7.

J6-1	253V	To Choke
J6-2	250V	From Choke
J7-1	245V	Right Output Transformer B+ (Edcor GXSE red wire)
J7-2	245V	Left Output Transformer B+ (Edcor GXSE red wire)
J9-1	6.3VAC from J9-1 to J9-2	Filament Tap
J9-2	6.3VAC from J9-2 to J9-1	Filament Tap

RESISTANCE CHART

- **Take measurements when unit is OFF, supply caps are drained & with no connections to transformers**
- **Consider readings >1 meg to be open**
- **Some readings will fluctuate due to capacitance**
- **All measurements +/-5%**

V1	**12SL7**
PIN#	
1	475K
2	>200K (may fluctuate)
3	1K
4	475K
5	>200K (may fluctuate)
6	1K
7	>200K (may fluctuate)
8	<1 ohm

V2,V3	**1626**
PIN#	
1	open
2	<1 ohm
3	open
4	open
5	220K
6	open
7	>200K (may fluctuate)
8	1K

J1-1 475K
J1-2 <1 ohm

J2-1 475K
J2-2 <1 ohm

J3-1 open
J3-2 open

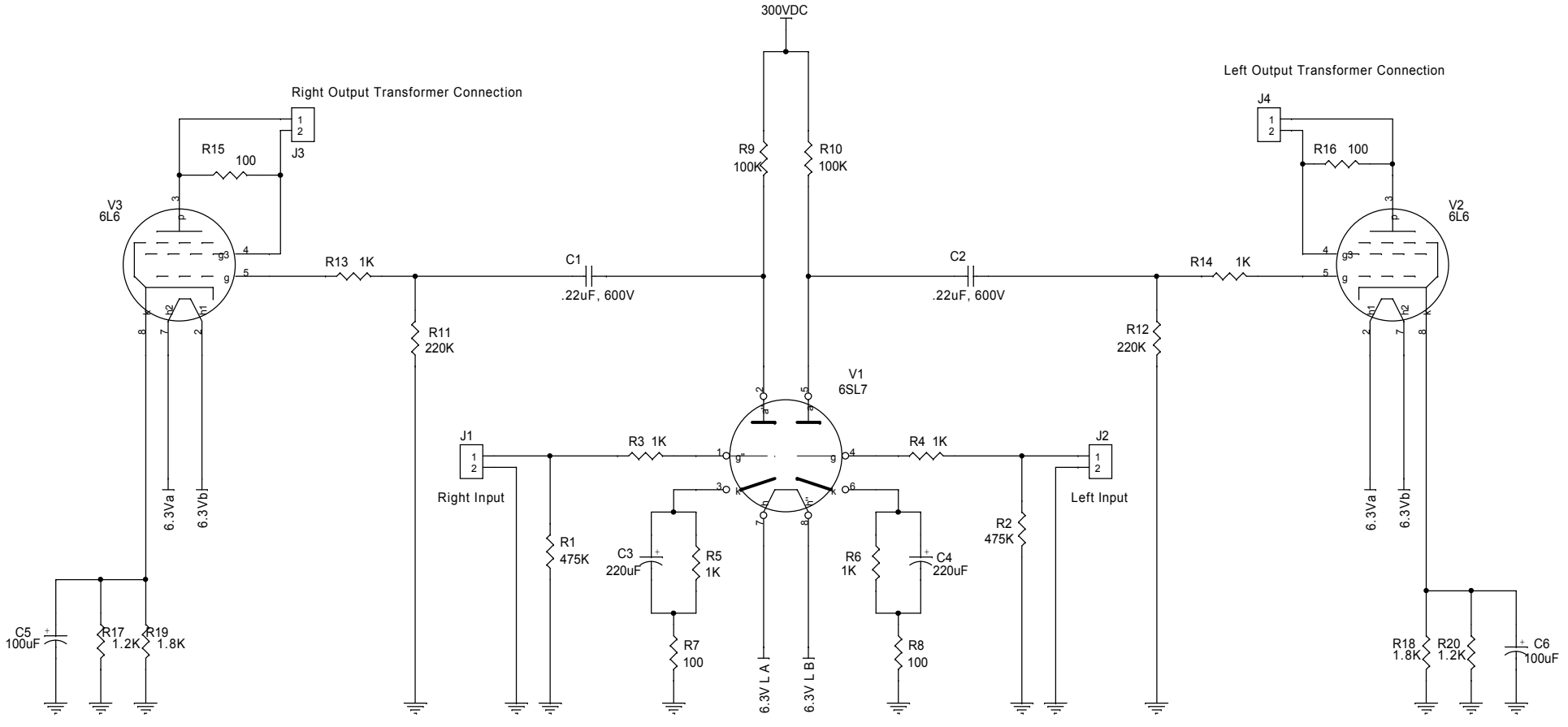
J4-1 open
J4-2 open

J5-1 open
J5-2 open
J5-3 open

J6-1 >200K (may fluctuate)
J6-2 >200K (may fluctuate)

J7-1 >200K (may fluctuate)
J7-2 >200K (may fluctuate)

J9-1 open
J9-2 open



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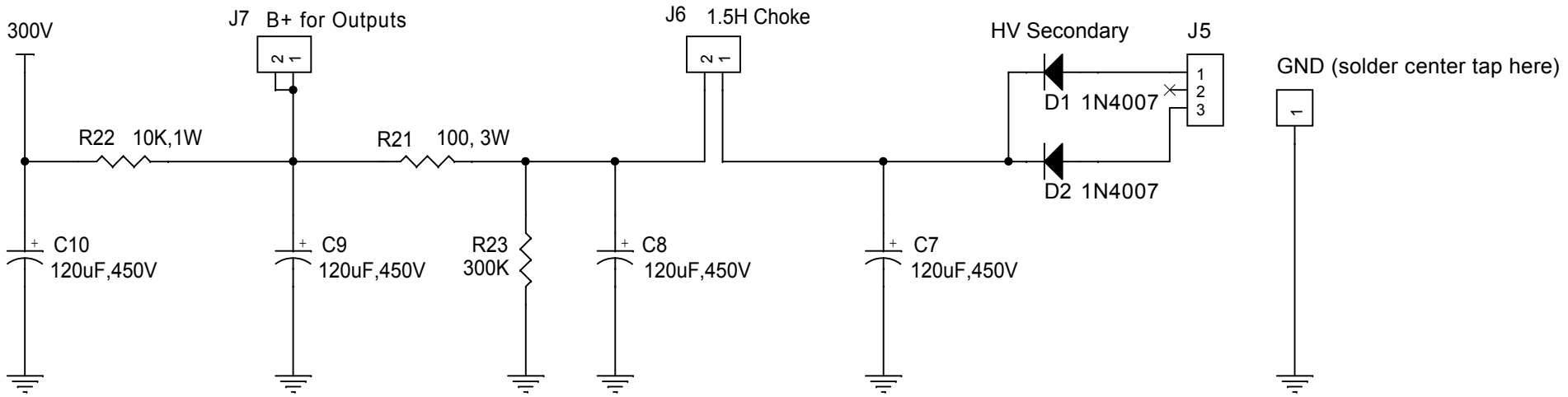
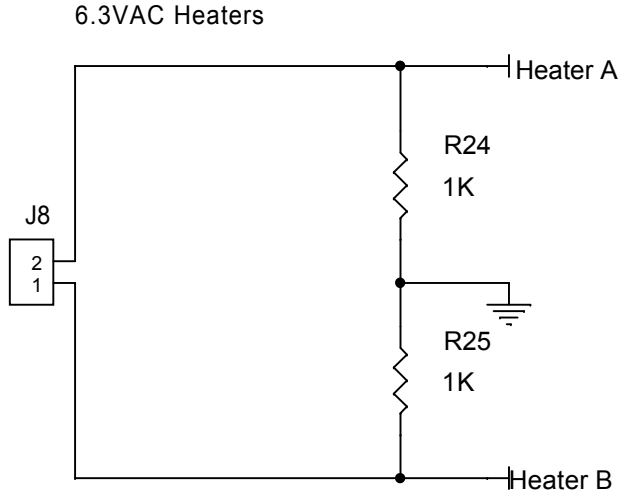
diytube clementine 6L6





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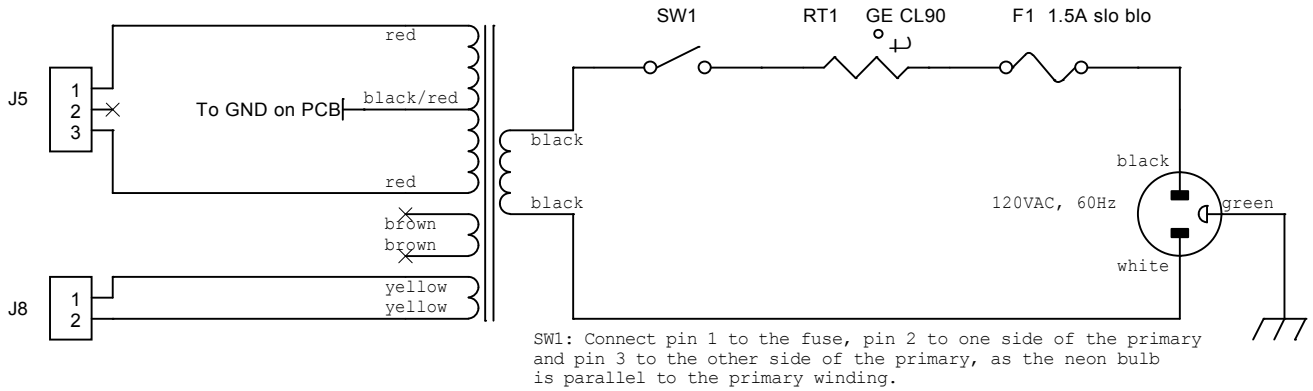
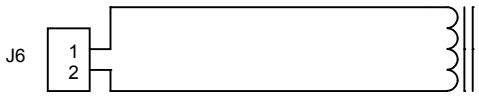
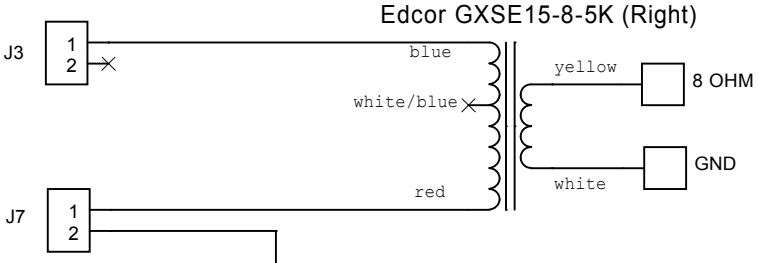
Edcor XPWR005-120 (or PA774)



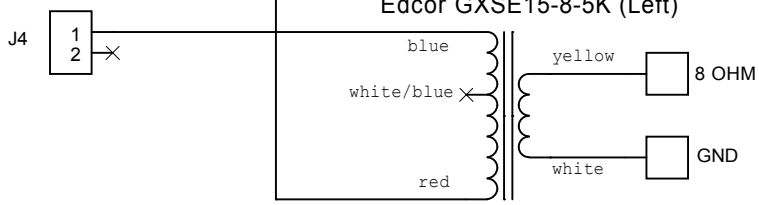
SW1: Connect pin 1 to the fuse, pin 2 to one side of the primary and pin 3 to the other side of the primary, as the neon bulb is parallel to the primary winding.

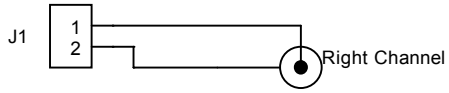


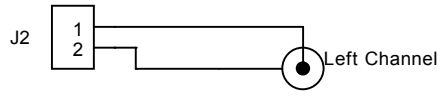
Edcor GXSE15-8-5K (Right)



Edcor GXSE15-8-5K (Left)







J1-1 Right Input +
J1-2 Right Input -

J2-1 Left Input +
J2-2 Left Input -

J3-1 Right Output Transformer Plate (blue)
J3-2 No connection

J4-1 Left Output Transformer Plate (blue)
J4-2 No connection

J5-1 Red Secondary
J5-2 No Connect
J5-3 Red Secondary
Important: Solder secondary center tap to GND eyelet by J5 & J7.

J6-1 To Choke
J6-2 From Choke

J7-1 Right Output Transformer B+ (red)
J7-2 Left Output Transformer B+ (red)

J8-1 Filament Tap
J8-2 Filament Tap

Clementine 6L6 Parts List

RL1	GE CL90 IRCL	527-CL90	1.72
D1,D2	UF4007 Diode	625-UF4007-E3	0.19
C1,C2	.22uF, 600V	75-715P600V0.22	2.46
C3,C4	220uF, 25V	647-UVZ1E221MPD	0.22
C5,C6	100uF, 100V	647-UVZ2A101MPD	0.50
C7-C10	120uF, 450V (sub with 100uF or better, 25mm by 30mm max)	5985-380-450V121	3.57
R1,R2	475K, 1/2W	71-CMF60475K00FHEK	0.12
R3,R4,R5,R6, R13,R14	1K, 1/2W	71-CMF601K0000FHEK	0.34
R7,R8,R15,R16	100 ohm, 1/2W	71-CMF60100R00FHEK	0.34
R9,R10	100K, 1W	281-100K-RC	0.13
R11,R12	221K, 1/2W	71-CMF60221K00FHEK	0.12
R17,R20	1.2K, 3W	72-RWM410-1K2-5	0.56
R18,R19	1.5K, 3W	72-RWM410-1K5-5	0.63
	Use these for >19W dissipation power tubes		
R18,R19	1.8K, 3W	72-RWM410-1K8-5	0.50
	Use these for <19W dissipation power tubes		
R21	100, 3W	72-RWM410-100-5	0.63
R22	10K, 1W	281-10K-RC	0.13
R23	330K, 2W	282-330K-RC	0.19
R24,R25	1K, 1W	281-1.0K-RC	0.13
J1,J2,J3,J4,J6, J7,J8,J10,J11	Terminal Blocks 5.08MM 2P	571-2828372	0.41
J5	Terminal Blocks 5.08MM 3P	571-2828373	1.11

Not used: J9

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527-CL90 1

625-UF4007-E3 2

75-715P600V0.22 2
647-UVZ1E221MPD 2
647-UVZ2A101MPD 2
5985-380-450V121 4

71-CMF60475K00FHEK 2
71-CMF601K0000FHEK 6
71-CMF60100R00FHEK 4
281-100K-RC 2
71-CMF60221K00FHEK 2
72-RWM410-1K2-5 2
72-RWM410-1K5-5 2
72-RWM410-1K8-5 2
72-RWM410-100-5 1
281-10K-RC 1
282-330K-RC 1
281-1.0K-RC 2

571-2828372 9
571-2828373 1

VOLTAGE CHART

- **DC measurements (unless noted)**
  - **Shorted input, no signal**
  - **All measurements +/-5%**

V1	**6SL7**
PIN#	
1	0V
2	215V
3	1.7V
4	0V
5	215V
6	1.7V
7	3.15VAC
8	3.15VAC

V2,V3	**6L6GA**
PIN#	
1	34V
2	3.15VAC
3	396V
4	396V
5	0V
6	0V
7	3.15VAC
8	34V

J1-1	0V	Right Input +
J1-2	0V	Right Input -
J2-1	0V	Left Input +
J2-2	0V	Left Input -
J3-1	396V	Right Output Transformer Plate (Edcor GXSE blue wire)
J3-2	396V	No connection (for UL mode: remove R15 to connect screen)
J4-1	396V	Left Output Transformer Plate (Edcor GXSE blue wire)
J4-2	396V	No connection (for UL mode: remove R16 to connect screen)
J5-1	331VAC	Red Secondary
J5-2	-	No Connect (floating)
J5-3	331VAC	Red Secondary

Important: Solder secondary center tap to **GND** eyelet by J5 & J7.

J6-1	420V	To Choke
J6-2	414V	From Choke
J7-1	404V	Right Output Transformer B+ (Edcor GXSE red wire)
J7-2	404V	Left Output Transformer B+ (Edcor GXSE red wire)
J8-1	3.15VAC	Filament Tap
J8-2	3.15VAC	Filament Tap

RESISTANCE CHART

- **Take measurements when unit is OFF, supply caps are drained & with no connections to transformers**
- **Consider readings >1 meg to be open**
- **Some readings will fluctuate due to capacitance**
- **All measurements +/-5%**

V1	**6SL7**
PIN#	
1	475K
2	>200K (may fluctuate)
3	1.1K
4	475K
5	>200K (may fluctuate)
6	1.1K
7	1K
8	1K

V2,V3	**6L6GA**
PIN#	
1	725 ohms
2	1K
3	open
4	open
5	220K
6	open
7	1K
8	725 ohms

J1-1 475K
J1-2 <1 ohm

J2-1 475K
J2-2 <1 ohm

J3-1 open
J3-2 open

J4-1 open
J4-2 open

J5-1 open
J5-2 open
J5-3 open

J6-1 >200K (may fluctuate)
J6-2 >200K (may fluctuate)

J7-1 >200K (may fluctuate)
J7-2 >200K (may fluctuate)

J8-1 1K
J8-2 1K

Addendum: Clementine ULtra Notes, Schematic & Hookup

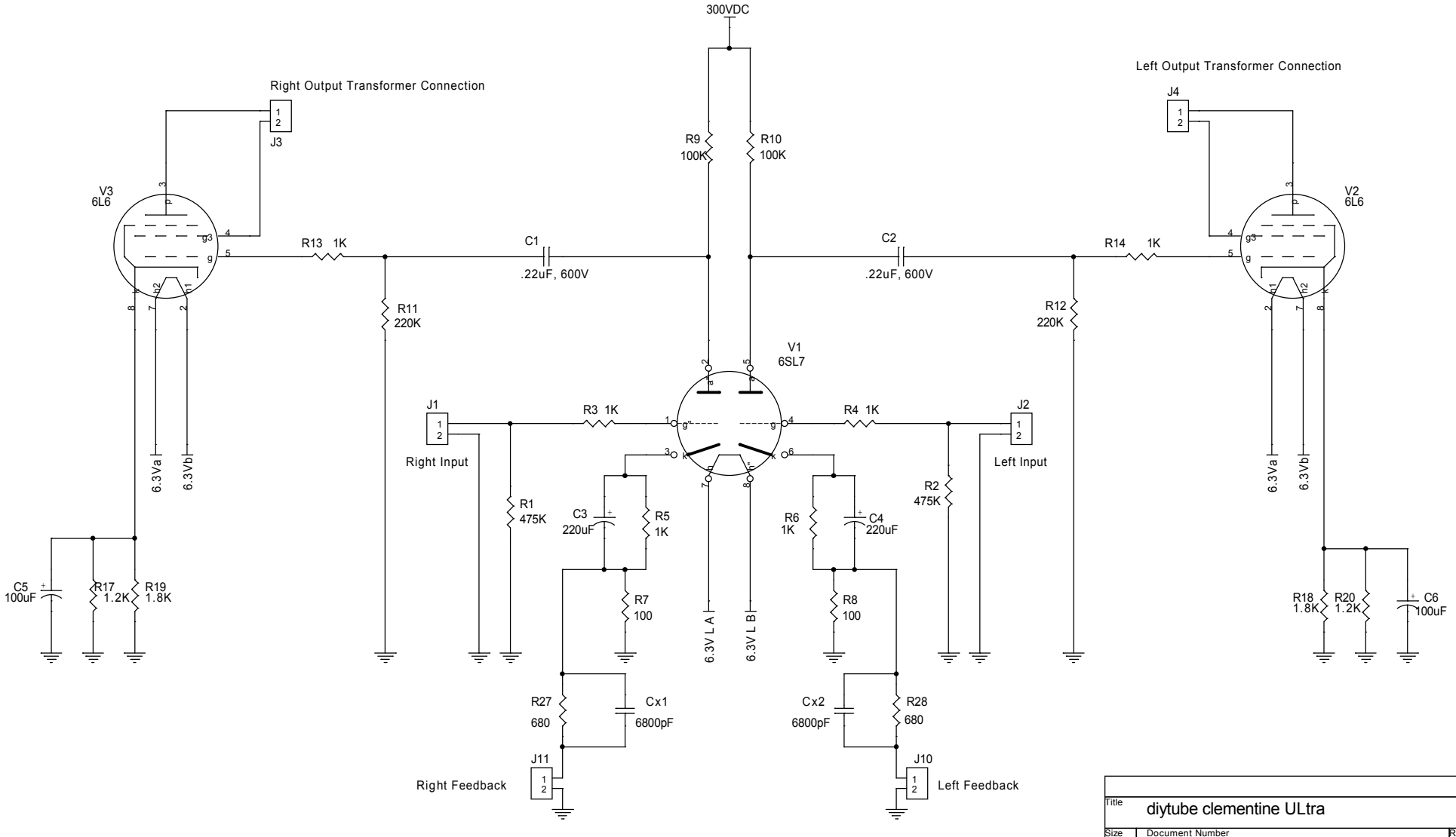
Here are my basic Clementine ULtra notes. I can add more commentary later. In a nutshell, I discounted an ultra-linear Clementine due to the high plate impedance thus extremely poor damping and high amplifier Z. But with 6dB of negative feedback, we gain parity with the triode configuration plus we get more output power as the mu is higher in an ultra-linear configuration. Damping factor was measured at 5.2 (UL without feedback is less than 1 and selective distortion wreaks havoc) and the distortion was mostly 2nd harmonic even at max power - key triode 'signatures'. Read more about this in RDH3 pages 16 and following. Note how beam tetrodes are superior to pentodes for this application. The only negative in the ULtra is the high input voltage needed - 1.6V for 7W - so a preamp is needed and an iPod will not drive it.

Mods from the Clementine 6L6 Build in the main thread:
- Remove R15 and R16 (no triode strap resistors)
- Connect ultra-linear taps to J3-2 and J4-2
- Use connectors at J10 and J11 or solder directly to the pads. I used CDROM audio cables since they are cheap shielded cables. The yellow output secondary (+) goes to J10-1 and J11-1 respectively. The white output secondary (-) goes to J10-2 and J11-2 respectively.
- R27 and R28 are 680 ohm resistors with 6800pF (i.e. 6.8nF or .0068uF) strapped across them. I am using cheap ceramic discs. A good temp rating or voltage rating is not important.

You are then done, and have about twice the power. It sounds pretty awesome, with the 3D 2nd harmonic is 100% there and no irritating dominant 3rd harmonic.

7W and 4W output power and distortion:
http://www.diytube.com/clementine/7wultra1640mV.pdf
http://www.diytube.com/clementine/4wultra1208mV.pdf

Shannon



Title	diytube clementine ULtra	
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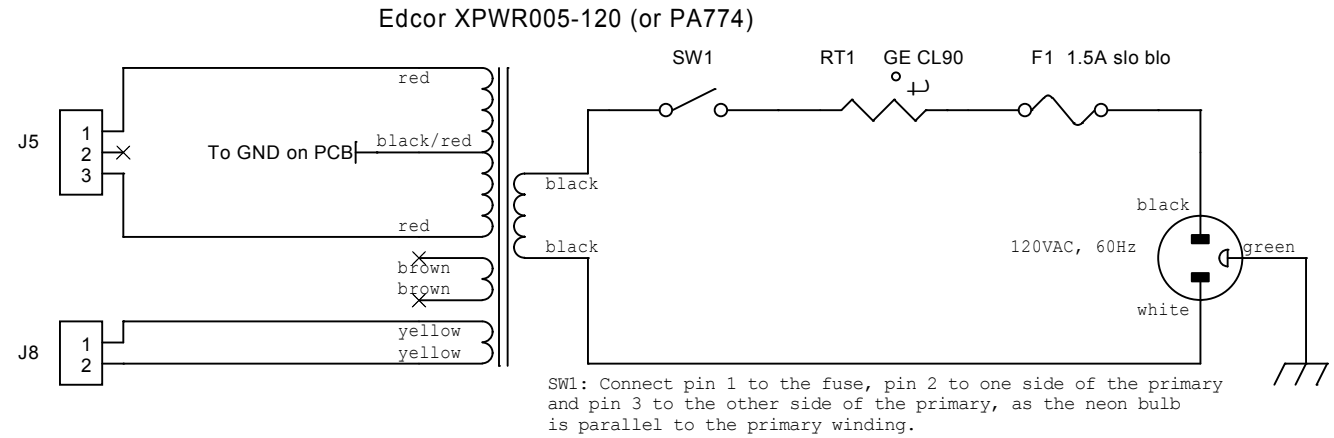
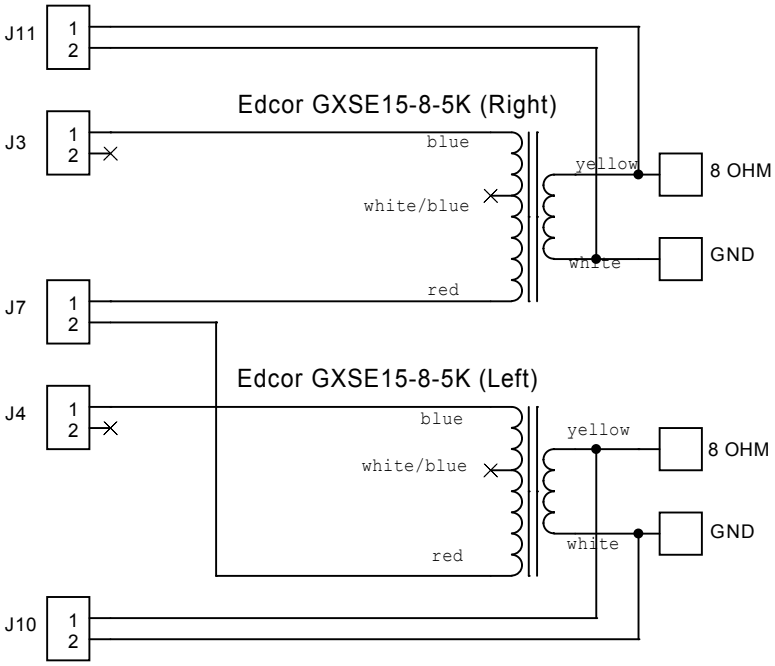
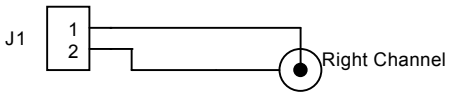
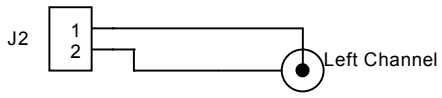
Date: Friday, August 12, 2011	Sheet 1 of 4	









J1-1 Right Input +
J1-2 Right Input -

J2-1 Left Input +
J2-2 Left Input -

J3-1 Right Output Transformer Plate (blue)
J3-2 No connection

J4-1 Left Output Transformer Plate (blue)
J4-2 No connection

J5-1 Red Secondary
J5-2 No Connect
J5-3 Red Secondary
Important: Solder secondary center tap
to GND eyelet by J5 & J7.

J6-1 To Choke
J6-2 From Choke

J7-1 Right Output Transformer B+ (red)
J7-2 Left Output Transformer B+ (red)

J8-1 Filament Tap
J8-2 Filament Tap

J10-1 To Left Speaker +
J10-2 To Left Speaker -

J11-1 To Right Speaker +
J11-2 To Right Speaker -