Laurel IIX

A
300B
Single Ended Amplifier Kit

Assembly Manual
for
Laurel IIX Monoblocks

Designed by:

Alan Kimmel

Ron Welborne

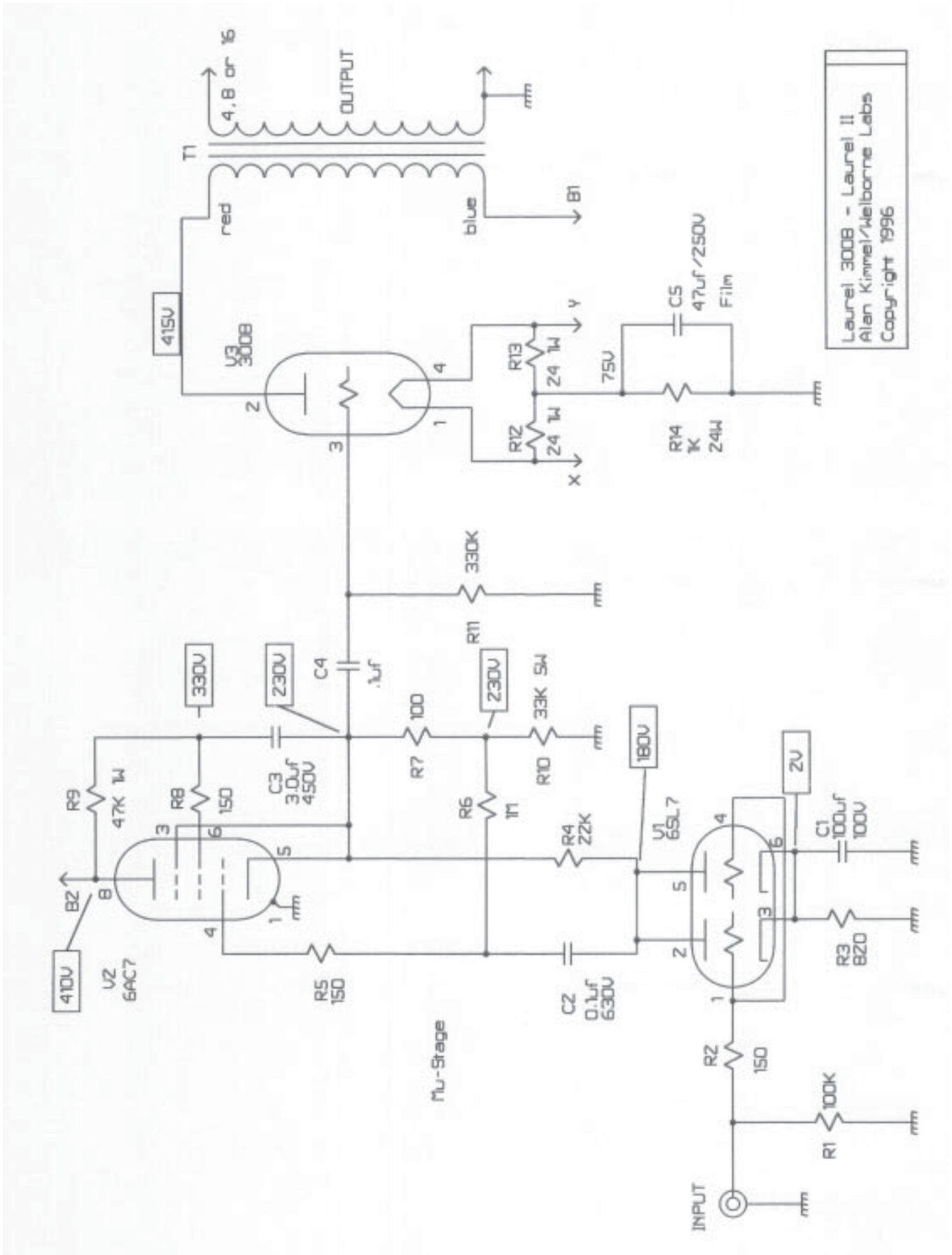
Words of Caution

Always keep in mind that you are the manufacturer of this amplifier. The final appearance of this amp and its sound quality will largerly depend upon the care taken during the assembly of this kit. We recommend that your work surface be padded, clean of debris and kept clean during assembly. This will prevent the top plate and wooden base from becoming accidentally scratched. Keep finger prints to a minimum (wear white cotton gloves when handling the brass chassis plate). Once the transformers are mounted to the chassis plate, the unit becomes very heavy and much harder to handle. So be careful and don't drop it on your dining room table! Don't create antennas out of the hookup wire by making big loops and arches. Keep all wiring neat, lead lengths short and routed close to the chassis plate. Believe us when we say "neat wiring sounds mo better".

Always remember the nature of the equipment that you are working on. It contains high voltages and can cause serious personal injury. Always make sure that capacitors are completely discharged before handling or soldering the internal components. Never disconnect the power cord, or remove tubes while the unit is powered on.

Tools Required for Assembly

Soldering Iron
Solder
Solder Wick™ or Solder-Removing Device
Pliers
Wire Strippers
Hex Drivers
Screw Drivers
Volt/Ohm Meter
Epoxy
Cotton Gloves


Laurel 3008 - Laurel II
Alan Kimmel/Welborne Labs
Copyright 1996
T1
4,8 or 16
OUTPUT
red
blue
B1
415V
V3
3008
R13
24 1W
R12
24 1W
R14
1K
24W
C5
47uf/250V
Film
75V
330K
R11
33K 5W
230V
C4
.1uf
C3
3.0uf
450V
R7
100
R6
111
R10
R4
22K
R9
47K 1W
R8
150
R5
150
C2
0.1uf
630V
330V
230V
180V
2V
410V
B2
V2
6AC7
V1
6SL7
C1
100uf
100V
R3
820
R2
150
R1
100K
INPUT
Mu-Stage

Laurel II 300B Amplifier Circuit (one channel)

Resistors

R1	100K	1/2 W	AB Carbon Comp or Holco Metal Film
R2,R5,R8		1/2W	AB Carbon Comp or Holco Metal Film
R3		1/2W	AB Carbon Comp or Holco Metal Film
R4	22K	1/2W	AB Carbon Comp or Holco Metal Film
R6	1M	1/2W	AB Carbon Comp or Holco Metal Film
R7	100	1/2W	Non-Inductive Wirewound
R9	47K	1W	AB Carbon Comp
R10	33K	5W	Non-Inductive Wirewound
R11	330K	1/2W	AB Carbon Comp or Holco Metal Film
R12,R13	24	1W	Non-Inductive Wirewound
R14	2K x2.2 in paralel	12W	Non-Inductive Wirewound

Capacitors

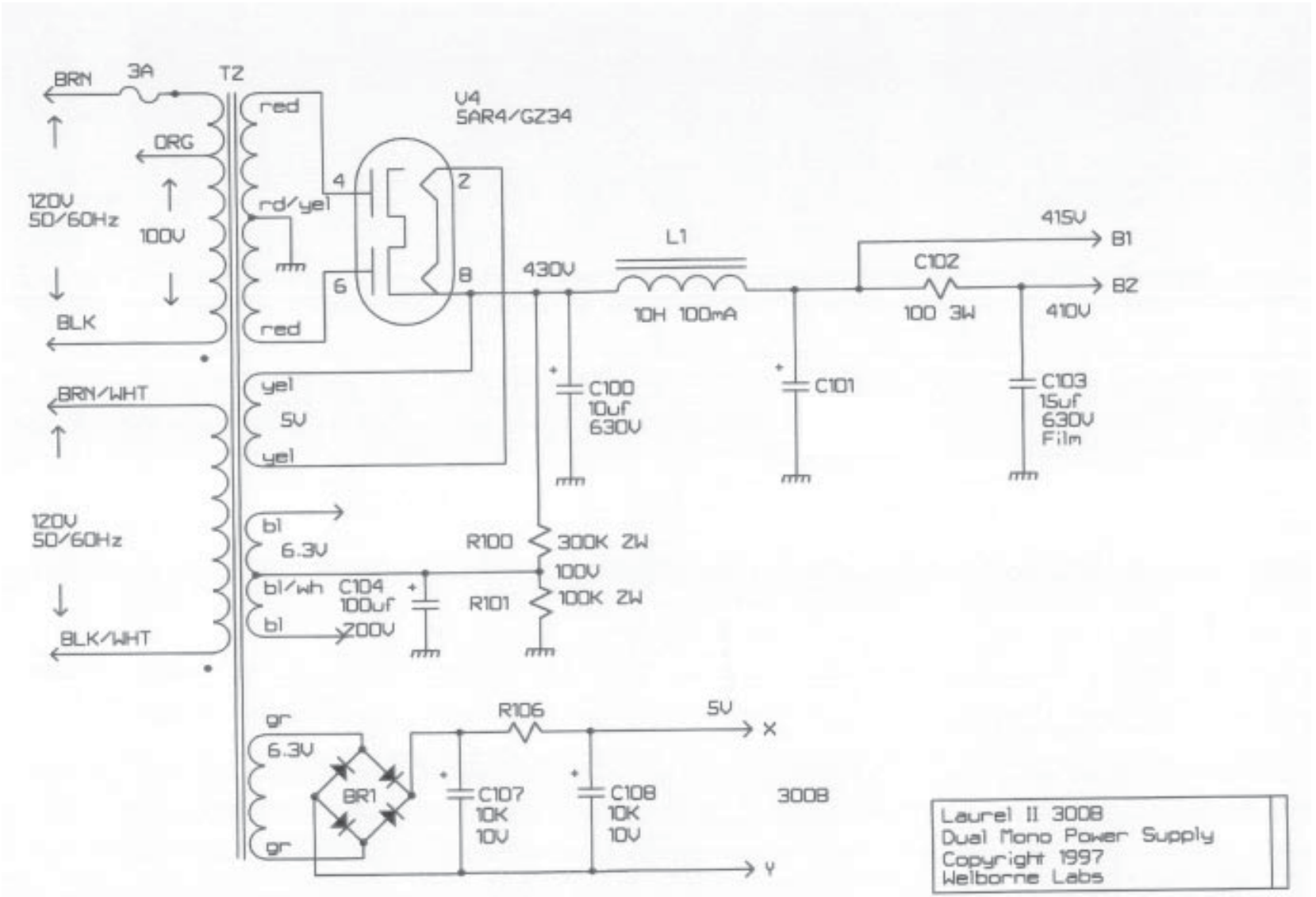
C1	100UF/35V	Cerafine Electrolytic
C2	0.1uF/400V	MusiCap or Paper In Oil Capacitor
C3	3.0uF/400V	Solen Polypropylene Film
C4	0.1uf/400V	MusiCap or Paper In Oil Capacitor
C5	47uf/250V	Solen Fast Cap Film

Vacuum Tubes

V1	6SL7GT	NOS
V2	6AC7	NOS
V3	300B/VV300B/VV32B	Golden Dragon/KR Enterprise/Sovtek/Western Electric

Miscellaneous

T1	Output Transformer	Electra-Print (3.5K primary)
S1,S2	Octal Chassis Mount Socket	Miscellaneous manufacturer
S3	4 Pin Chassis Mount Socket	Miscellaneous manufacturer
RCA	RCA Chassis Mount Jack	Cardas
BIND	Binding Post	Cardas
Wire	Input Wire	Coax
Wire	Signal Path	Solid Core OFC


BRN
3A
T2
ORG
120V
50/60Hz
100V
BLK
BRN/WHT
120V
50/60Hz
BLK/WHT
red
rd/yel
red
yel
5V
yel
bl
6.3V
bl/wh
bl
gr
6.3V
gr
BR1
V4
5AR4/GZ34
4
2
6
8
430V
L1
10H 100mA
C100
10uf
630V
C101
R100
300K 2W
100V
R101
100K 2W
C104
100uf
200V
R106
5V
X
Y
C107
10K
10V
C108
10K
10V
415V
B1
C102
100 3W
B2
410V
C103
15uf
630V
Film
3008
Laurel II 3008
Dual Mono Power Supply
Copyright 1997
Welborne Labs

Laurel II 300B Power Supply

Resistors

R100	300k	2W Metal Oxide or Carbon Comp
R101	100k	2W Metal Oxide or Carbon Comp
R102	100	3W Non-Inductive Wirewound
R106	0.8	12W Non-Inductive Wirewound

Capacitors

C100	10uF/630V	Solen Fast Cap Film
C101	47uf x 47ufuF/500V	Elna Cerafine Electrolytic
C104	100uf/200V	Electrolytic
C103,	15uF/630V	Solen Fast Cap Film
C107, C108	10kuF/10V	Electrolytic

Miscellaneous

V4	5AR4/GZ34	NOS
S4	Octal Socket	Miscellaneous Manufacturer
L1	15H/100mA	Hammond Choke
T2	350-0-350-5-6.3	Custom Power Transformer
BR1	100V/4A	Bridge Rectifier

IEC Connector
Fuse
Power Cord
Power Switch
Brass Screws
Hardware

Laurel Amplifier Assembly

It is assumed that the person(s) assembling this amplifier kit are somewhat knowledgeable in electronics, can read schematic diagrams, and have built kits and/or other equipment in a previous life. If you do not have experience building circuits it is recommended that you find someone that can help that is knowledgeable (GET HELP!). These instructions and diagrams are intended as a guide only. You are welcome to assemble the amp and position components as you like. However, we recommend that you follow this assembly sequence. Refer to the included figures as you follow the instructions. Assembly time will vary based upon your experience level and the attention given to doing a neat and tidy job, so you can expect anywhere from 10 to 20 hours to get it done right. If you have questions during assembly, please feel free to call.

The terminal boards have been installed to facilitate an easy and neat assembly. Solder components between terminals when possible (either vertically or horizontally) and use hookup wire from terminal-to-terminal and terminal-to-socket lug connections. Use a fast drying epoxy to tack components to the chassis plate when necessary. This will help to prevent components from flopping around and vibrating. Use the epoxy sparingly in case a component needs to be removed at a later time.

Teflon tubing has been provided to dress a few of the bare component (resistors, caps, etc.) leads to prevent shorting.

1) To begin, remove the bottom black panels. Mount the tube sockets using the supplied hardware and in the direction shown in figure 3. The chassis plates are mirror images of each other and therefore as you continue through the assembly steps note that some components will have to mount differently on the opposite plate. If you are installing the Ultimate Upgrade package note that the teflon tube socket pins are not marked with numbers. Orient and install sockets V1, V2 and V4 according to the key in the center of the socket. Note that tube socket V3 is not "keyed" but has two small diameter pins and two large diameter pins. The small diameter pins are 2 and 3. The large pins are 1 and 4. Orient and mount the socket according to the drawing.

   The lugs of the terminal boards TB1, TB2, TB3 and TB5 have been numbered (refer to figures 3 and 3X) to facilitate assembly. In subsequent steps a specific lug will be referenced by the terminal board number followed by the lug number. For example: "solder a red wire from TB3-22 to TB1-2", refers to lug #22 of terminal board TB3 and lug #2 of terminal board TB1.

   In a similar manner, the tube socket pins will be referenced first by the tube number followed by the pin number. For example V4-3 refers to pin #3 of the V4 rectifier tube.

   Take a few minutes to familiarize yourself with the layouts of the chassis plates in figures 3 and 3X. The two monoblocks are mirror images of each other. Please note that while terminal TB3 numbers are "mirrored" the tube socket pins are not.

   The wiring shown on the figures appears somewhat messy. This is intentional as we have spread the wires out to make them more visible for your assembly process. As you assemble the wires and connections be a little bit neater with their layout. Route them close to the brass chassis and underneath the terminal boards and components. Do not make big airborne loops out of the wires as they will act as antennas and pickup noise, radio stations, etc. Be very careful with that soldering iron and don't burn the insulation off of any adjacent components.

2) Mount the output transformer T1 and the power transformer T2 using the supplied hardware. It is generally easiest to do this by laying the chassis on a flat surface and feeding the transformer wires down through their respective holes. Refering to figure 4 and identifying the location of the transformer lead colors will give you and indication of which direction to orient the transformers when mounting them onto the brass plate. Be careful not to scratch the brass surface with the transformer edges or your tools. Secure the transformers to the chassis using the button head screws, brass washers and brass nuts supplied in the plastic bag marked "H/W".

   Once the transformers are secured to the brass plate, remove the brass plate from its wooden base. Place the wooden bases out of the way. Turn the brass plates upside down and the lay the assembly on your work space such that they are resting on the transformers. Your workspace should have a padded surface to prevent the transformers from becoming scratched.

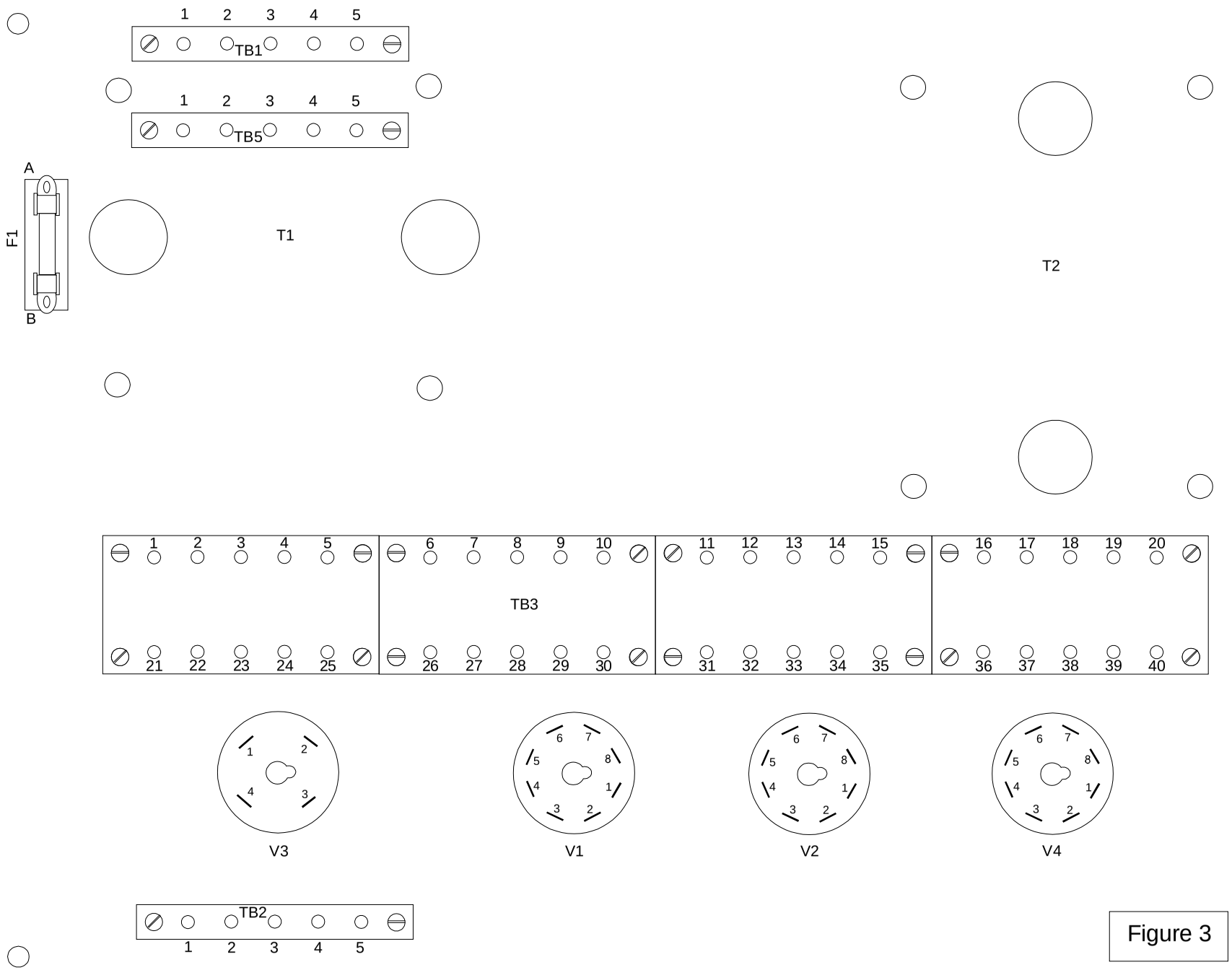

1 2 3 4 5
TB1
1 2 3 4 5
TB5
A
F1
B
T1
T2
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
TB3
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
V3
V1
V2
V4
TB2
1 2 3 4 5

Figure 3

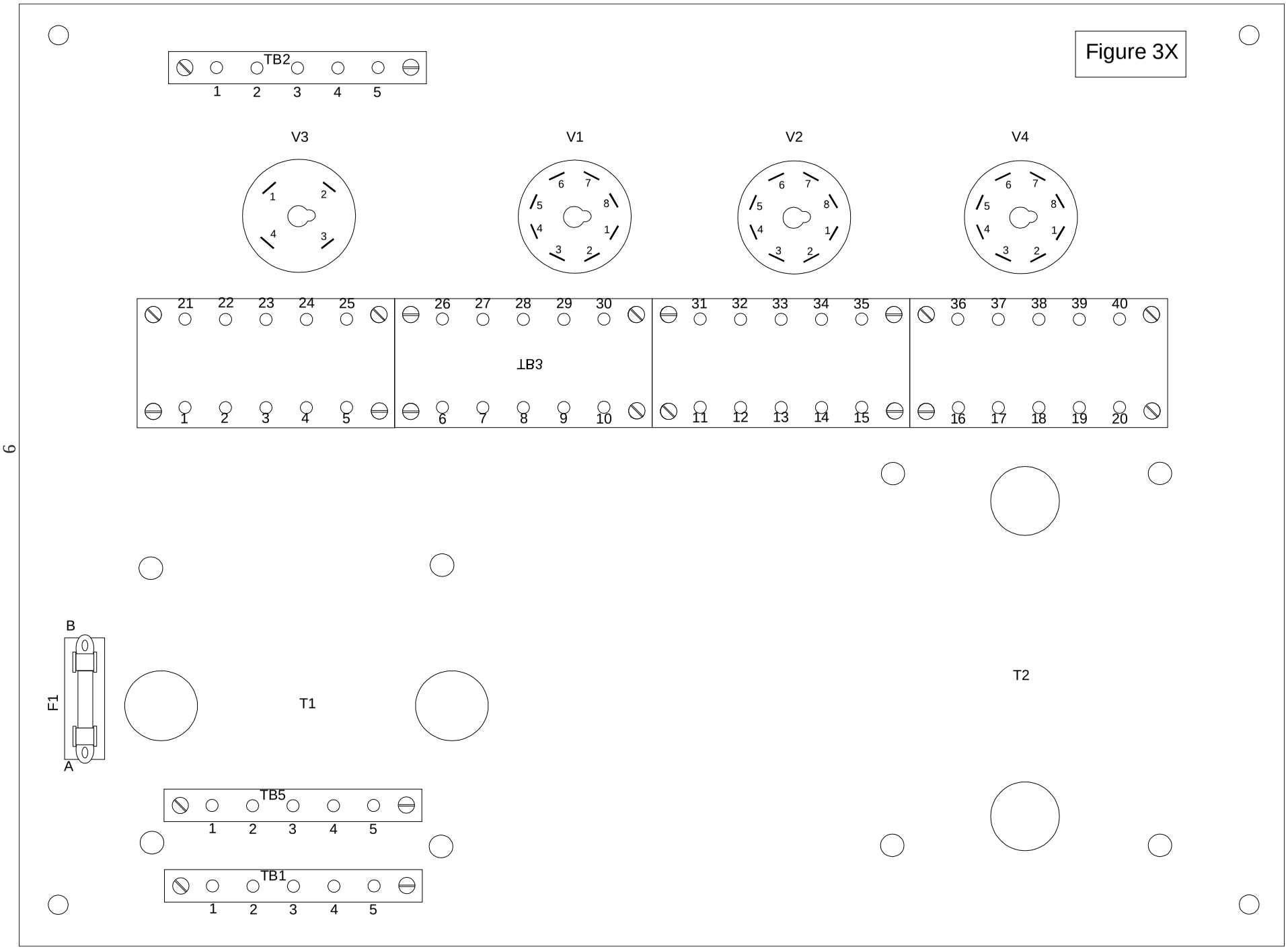


Figure 3X
TB2
1 2 3 4 5
V3
V1
V2
V4
1 2 3 4
6 7 8 1 2 3 4 5
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
TB3
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
B
F1
A
T1
T2
TB5
1 2 3 4 5
TB1
1 2 3 4 5

3) Begin by soldering all of the transformer leads to their respective terminals.

Connect the red lead of transformer T1 to TB3-16. Connect the blue lead of T1 to V3-2.

Connect the blue and white striped lead of transformer T2 to V4-7. Route the leads as shown in figure 4.

There are two yellow leads from transformer T2. Twist these two leads together using approximately 2 twists per inch, route them around TB3 as shown in figure 4, and solder one yellow lead to V4-2 and the other one to V4-8.

There are two red leads from transformer T2. Twist these two leads together using approximately 2 twists per inch, route them under TB3 as shown in figure 4, and solder one red lead to V4-4 and the other one to V4-6.

There are two blue leads from transformer T2. Twist these two leads together using approximately 2 twists per inch, route them under TB3 as shown in figure 4, and solder one blue lead to V2-2 and the other one to V2-7.

There are two green leads from transformer T2. Twist these two leads together using approximately 2 twists per inch, route them along TB3 as shown in figure 4, and solder one green lead to TB3-9 and the other one to TB3-10.

Locate the green and yellow striped lead from T2. Cut this lead short as it will not be used. The end of the lead can be taped or covered with heat shrink tubing.

Connect the red and yellow striped lead of transformer T2 to TB3-14.

4) Connect the T2 transformer primary leads based upon your ac voltage requirements. Refer to figure 4 (this figure depicts 120Vac).

For **120Vac/60Hz** operation hookup the T2 primary as follows:
Locate the brown, brown/white, black and black/white leads of transformer T2. Twist the brown and brown/white leads together using approximately 3 twists per inch and solder to TB1-4. Trim to an appropriate length the black and black/white leads, strip the ends and solder to TB1-5. Cut the orange wire to a length of approximately 1 inch and tape the end using electrical tape or cover with heat shrink tubing.

For **220Vac/50Hz** operation hookup the T2 primary as follows:
Solder the black and brown/white leads together and tape their ends or cover with heat shrink tubing. Connect the black/white lead wire to TB1-5. Trim to an appropriate length, strip the ends and solder to the lug. Solder the orange wire to TB1-4. Cut the brown wire to a length of approximately 1 inch and tape the end using electrical tape cover with heat shrink tubing.

For **240Vac/50Hz** operation hookup the T2 primary as follows:
Solder the black and brown/white leads together and tape their ends or cover with heat shrink tubing. Connect the black/white leadwire toTB1-5. Trim to an appropriate length, strip the ends and solder to the lug. Solder the brown lead wire to TB1-4. Cut the orange wire to a length of approximately 1 inch and tape the end using electrical tape or cover with heat shrink tubing.

For **100Vac/50Hz** operation hookup the T2 primary as follows:
Solder the brown and brown/white leads together and tape their ends or cover with heat shrink tubing. Twist together the black and black/white leads and solder them to TB1-5. Solder the orange wire to TB1-4.

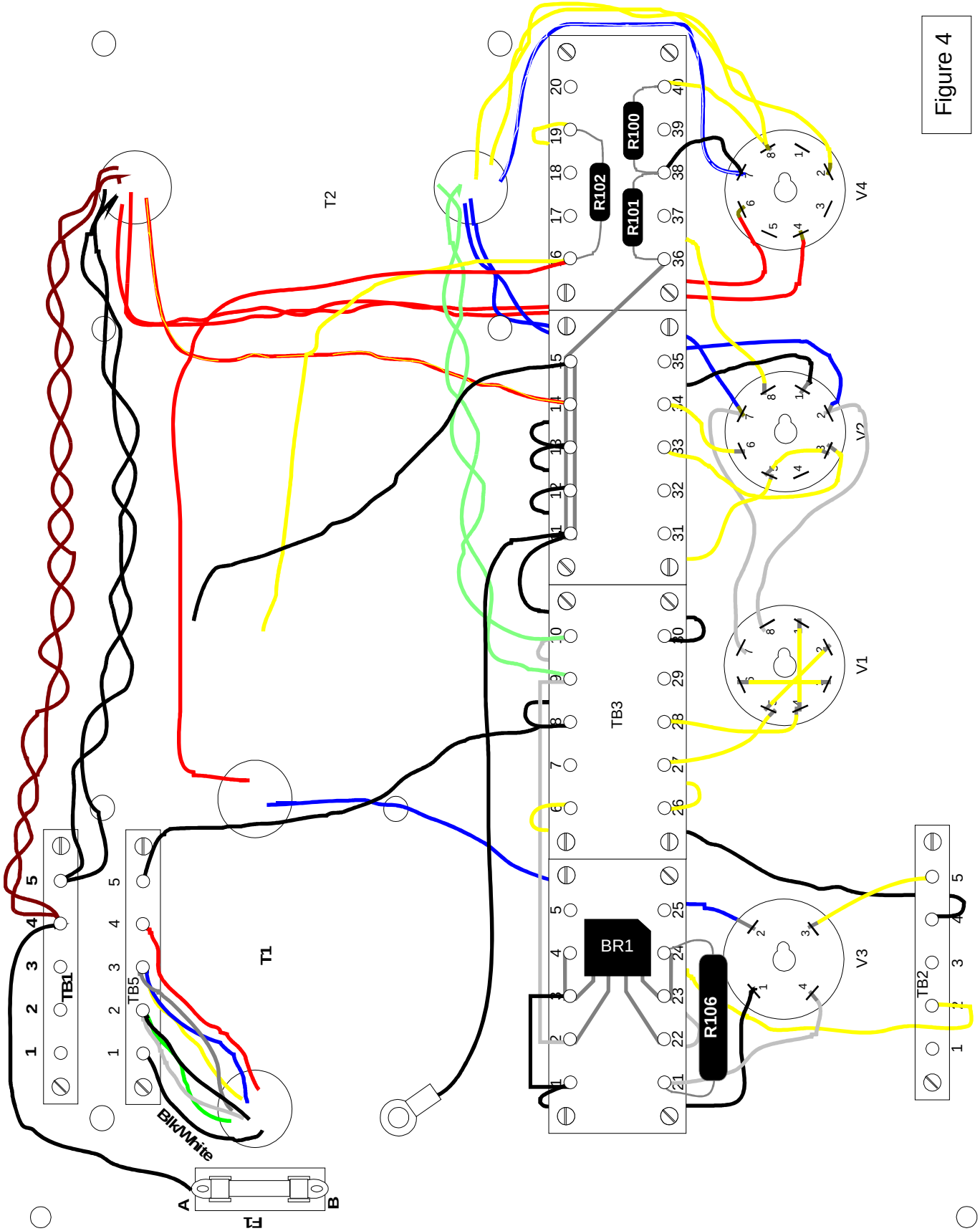

T2
R102
R101
R100
V4
V2
V1
TB3
BR1
R106
V3
TB2
T1
TB1
TB5
Blk/White
F1
A
B

Figure 4

5) For this step you need to decide which tap of the output transformer you will be using (2, 4, 8, or 16 ohms). This decision is best made based upon the impedance of the speakers you will be using.

Refer to the table below for the output transformer coding. The output impedances are selected by interconnecting the eight color coded secondary leads as shown below. Terminal Strip 5 (TB5) has been set up to facilitate the configuration of the output transformer wiring. Figure 4b depicts the connection for 8 ohms, however the terminals of TB5 can be used for connecting any of the configurations below. If you decide to shorten the output leads of the output transformer, the red enamel coating on the wires must be removed before soldering to the terminals. This can be easily done by scraping with a razor blade.

16 OHMS	8 OHMS	4 OHMS	2 OHMS
BW - Output	BW - Output	Join CL, GR - Output	Join BW, CL, GR, Y - Output
Join BK, CL	Join BK, CL, GR	Join WH, BL, BW, Y	Join BK, WH, BL, R - Ground
Join WH, GR	Join WH, BL, Y	Join BK, R - Ground	
Join BL, Y	R - Ground		
R - Ground			

Join the leads by soldering them to the terminals of TB1.

Secondary wire color code:	
BW - Black w/White Letters	GR - Green
BK - Black	BL - Blue
CL - Clear	Y - Yellow
WH - White	R - Red

6) Cut a piece of the bare silver hookup wire, wrap and solder the piece such that it makes connection with TB3-11, TB3-12, TB3-13, TB3-14, TB3-15 and TB3-36. Refer to figure 4.

Shape the lead wires of resistor R102 and solder it between terminals TB3-16 and TB3-19. Refer to figure 4.

Cut a piece of the yellow hookup wire approximately 6 inches length and solder one end to terminal TB3-16. Leave the other end unterminated, it will be connected later.

Cut a piece of the black hookup wire appriximately 4 inches in length and solder one end to TB3-15. Leave the other end unterminated, it will be connected later.

Cut a piece of the yellow hookup wire to length and solder between TB3-19 and V2-8 routing the wire underneath TB3.

Cut a piece of the yellow hookup wire to length and solder between TB3-40 and V4-8.

Cut a piece of the black hookup wire to length and solder between TB3-38 and V4-7.

Solder resistor R100 between TB3-38 and TB3-40. Solder resistor R101 between TB3-38 and TB3-36. Refer to figure 4b.

Mount the bridge rectifier BR1 to TB3 as shown in figure 4b. The positive lead (identified by the "+" sign) solders to TB3-23 and TB3-24 The negative lead (identified by the "-" sign) is soldered to TB3-3 and TB3-4. One of the inner leads is soldered to TB3-22 and the other to TB3-2 as shown in figure 4b.

Cut to length a piece of the white hookup wire and solder between TB3-2 and TB3-9 routing the wires underneath the terminal board.

Cut to length a piece of the white hookup wire and solder between TB3-22 and TB3-10 routing the wires underneath the terminal board.

Cut to length a piece of the white hookup wire and solder between TB3-21 and V3-4.

Cut to length a piece of the black hookup wire and solder between TB3-1 and V3-1.

Cut to length a piece of the black hookup wire and solder between TB3-1 and TB3-3.

Solder resistor R106 between terminals TB3-21 and TB3-24 as shown in figure 4b.

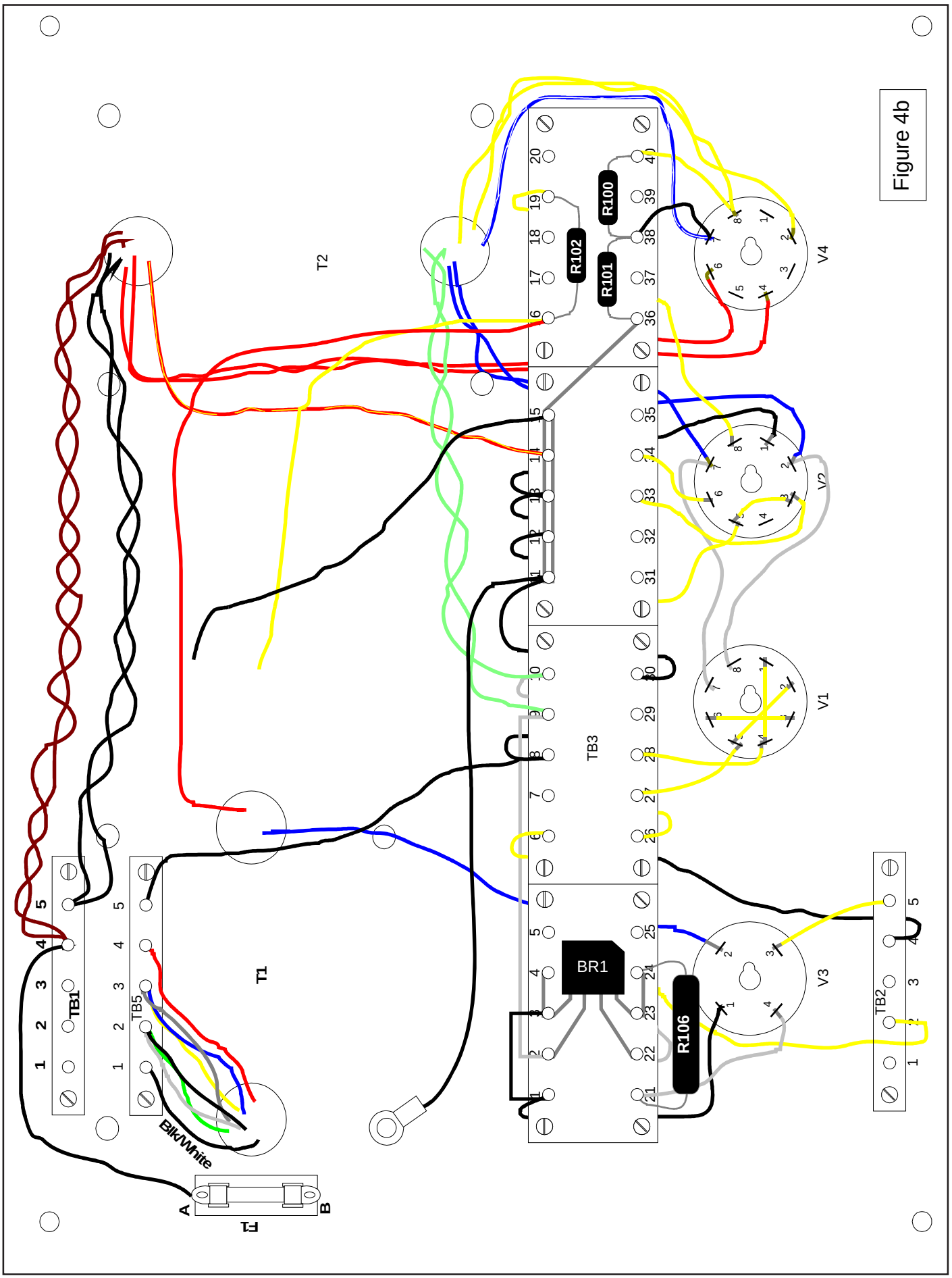

T2
R102
R101
R100
V4
V2
V1
TB3
BR1
R106
V3
TB2
T1
TB1
TB5
Blk/White
F1
A
B

Figure 4b

Cut a piece of yellow hookup wire to length and solder between TB3-6 and TB2-2 routing the wire underneath TB3.

Cut a piece of black hookup wire to length and solder between TB3-13 and TB2-4 routing the wire underneath TB3.

Cut to length a piece of the yellow hookup wire and solder between TB2-5 and V3-3.

Cut to length a piece of the yellow hookup wire and solder between V1-1 and V1-4.

Cut to length a piece of the yellow hookup wire and solder between V1-2 and V1-5.

Cut to length a piece of the yellow hookup wire and solder between V1-3 and V1-6.

Cut to length a piece of the yellow hookup wire and solder between V1-4 and TB3-28.

Cut to length a piece of the yellow hookup wire and solder between V1-5 and TB3-27.

Cut to length a piece of the white hookup wire and solder between V1-8 and V2-2.

Cut to length a piece of the white hookup wire and solder between V1-7 and V2-7.

Cut to length a piece of the yellow hookup wire and solder between V2-3 and V2-5.

Cut to length a piece of the black hookup wire and solder between V2-1 and TB3-13.

Cut a piece of yellow hookup wire to length and solder between TB3-26 and V2-5 routing the wire underneath TB3.

Cut a piece of yellow hookup wire to length and solder between TB3-33 and V2-3 routing the wire underneath TB3.

Cut a piece of black hookup wire to length and solder between TB3-11 and TB3-30 routing the wire underneath TB3.

Cut a piece of yellow hookup wire to length and solder between TB3-34 and V2-6. Refer to figure 4b.

Cut a piece of black hookup wire to length and solder between TB3-8 and TB3-12.

Cut to length a piece of the black wire and solder between TB5-5 and TB3-8.

Cut a piece of black hookup wire approximately 6 inches in length and solder one end to TB3-11. Solder one of the terminal rings to the other end of this wire. The ring end will be connected later. Refer to figure 4b.

Cut a piece of black hookup wire to length and solder between TB1-4 and F1-A.

7) Now is a good time to inspect all connections and clean up any solder flux that may have splashed onto the terminal boards, brass plate, etc. As the amplifier is populated with more components it becomes more difficult to position the soldering iron without touching already placed parts. It is very important that you be aware of these parts when soldering and not accidentally burn the insulation off an adjacent component or wire. For this section, refer to figure 5 for all connections.

   Bend the leads of the bridge rectifier BR1 so that it is now positioned vertically as shown in figure 5. Carefully inspect the bridge rectifier leads to insure that none them are touching each other.

   Solder the positive terminal of capacitor C104 to TB3-38 and the negative terminal to TB3-36. Refer to figure 5.

   Solder capacitor C100 between terminals TB3-36 and TB3-40. Refer to figure 5.

   Position capacitor C107 as shown in figure 5 and solder the positive lead to terminal TB3-24 and the negative lead (identified by the “-” sign) to TB3-4.

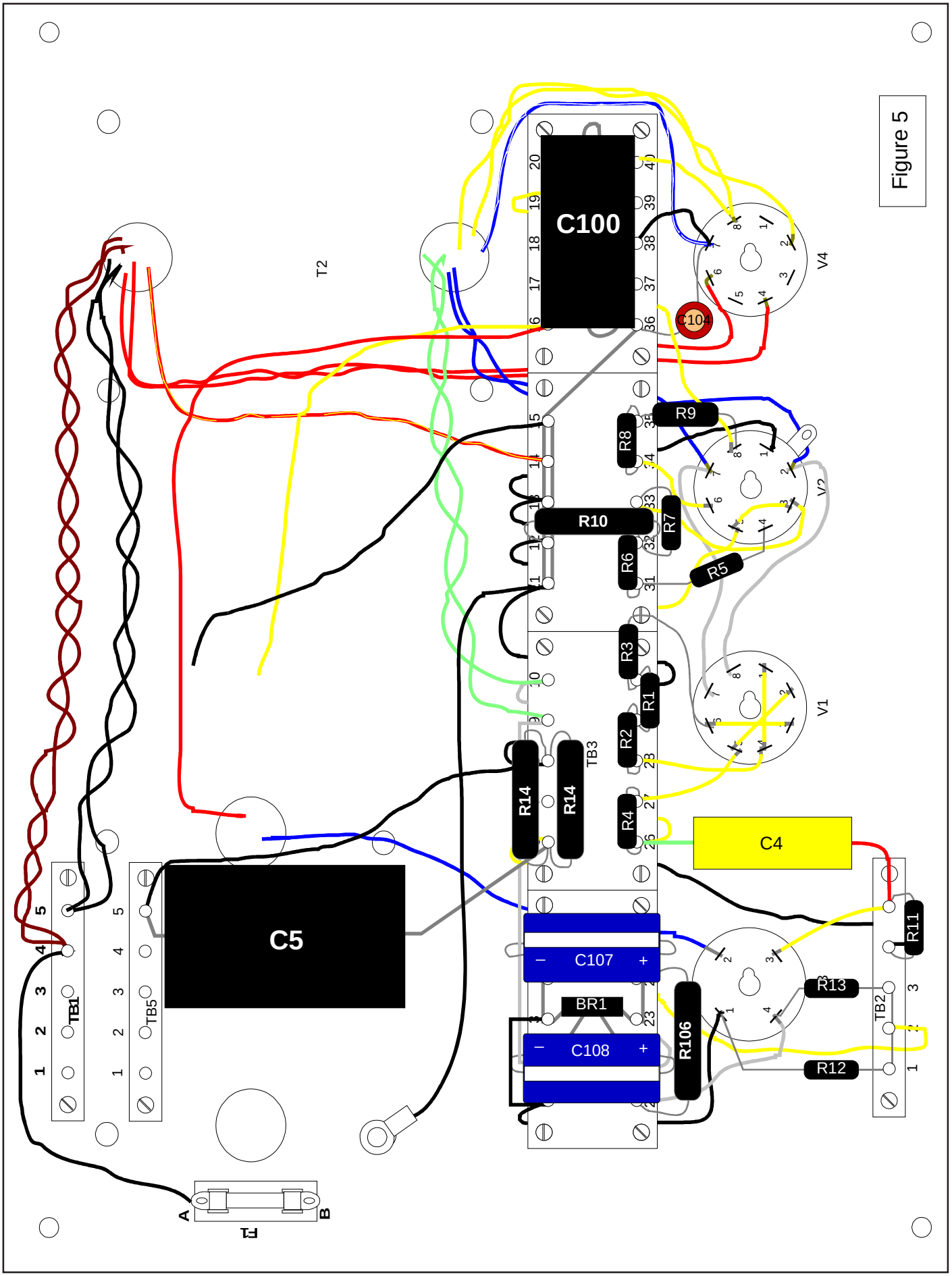

C100
T2
V4
C104
R9
R8
R10
R7
R6
R5
V2
R3
R1
R2
R4
V1
TB3
R14
R14
C4
C5
C107
BR1
C108
R106
R13
R12
R11
TB2
TB1
TB5
F1
A
B

Figure 5

Position capacitor C108 as shown in figure 5 and solder the positive lead to terminal TB3-21 and the negative lead (identified by the "-" sign) to TB3-1.

Position R13 as shown in figure 5 and solder one lead to TB2-2 and the other lead to V3-4.

Position R12 as shown in figure 5 and solder one lead to TB2-2 and the other lead to V3-1.

Resistor R14 is made up of two 2.2kohm resistors connected in parallel. Solder one lead of each resistor to TB3-6. Solder the other lead of each resistor to TB3-8. Mount the resistors so that they are suspended above the TB3 by approximately 1/2".

Mount C5 as shown in figure 5. Solder one lead to TB5-5. Solder the other lead to TB3-6.

Position R11 as shown in figure 5 and solder one lead to TB2-4 and the other lead to TB2-5.

Position C4 as shown in figure 5 and solder one lead to TB3-26 and the other lead to TB2-5.

Position R4 as shown in figure 5 and solder one lead to TB3-26 and the other lead to TB3-27.

Position R7 as shown in figure 5 and solder one lead to TB3-32 and the other lead to TB3-33.

Position R6 as shown in figure 5 and solder one lead to TB3-31 and the other lead to TB3-32.

Position R10 as shown in figure 5 and solder one lead to TB3-12 and the other lead to TB3-32.

Position R8 as shown in figure 5 and solder one lead to TB3-34 and the other lead to TB3-35.

Position R9 as shown in figure 5 and solder one lead to TB3-35 and the other lead to V2-8.

Position R5 as shown in figure 5 and solder one lead to TB3-31 and the other lead to V2-4. Be sure to use the Teflon sleeving with this resistor since more of the leads are exposed.

Position R3 as shown in figure 5 and solder one lead to TB3-30 and the other lead to V1-6. Be sure to use the Teflon sleeving with this resistor since more of the leads are exposed.

Position R2 as shown in figure 5 and solder one lead to TB3-28 and the other lead to TB3-29.

Position R1 as shown in figure 5 and solder one lead to TB3-29 and the other lead to TB3-30.

8) Now is another good time to inspect all connections and clean up any solder flux. Refer to figure 6 for the following assembly steps.

Position C3 as shown in figure 6 and solder one lead to TB3-33 and the other lead to TB3-35.

Position C1 as shown in figure 6 and solder the positive lead to V1-6 and the negative lead to TB3-30.

Position C2 as shown in figure 6 and solder one lead to TB3-27 and the other lead to TB3-31.

Mount capacitor C103 as shown in figure 6 and solder its leads between terminals TB3-19 and TB3-15.

You previously soldered a black wire to TB3-11 which has a ring terminal on its opposite end. Secure this ring terminal end to the transformer bolt of T1 using one of the brass nuts. Refer to figure 6.

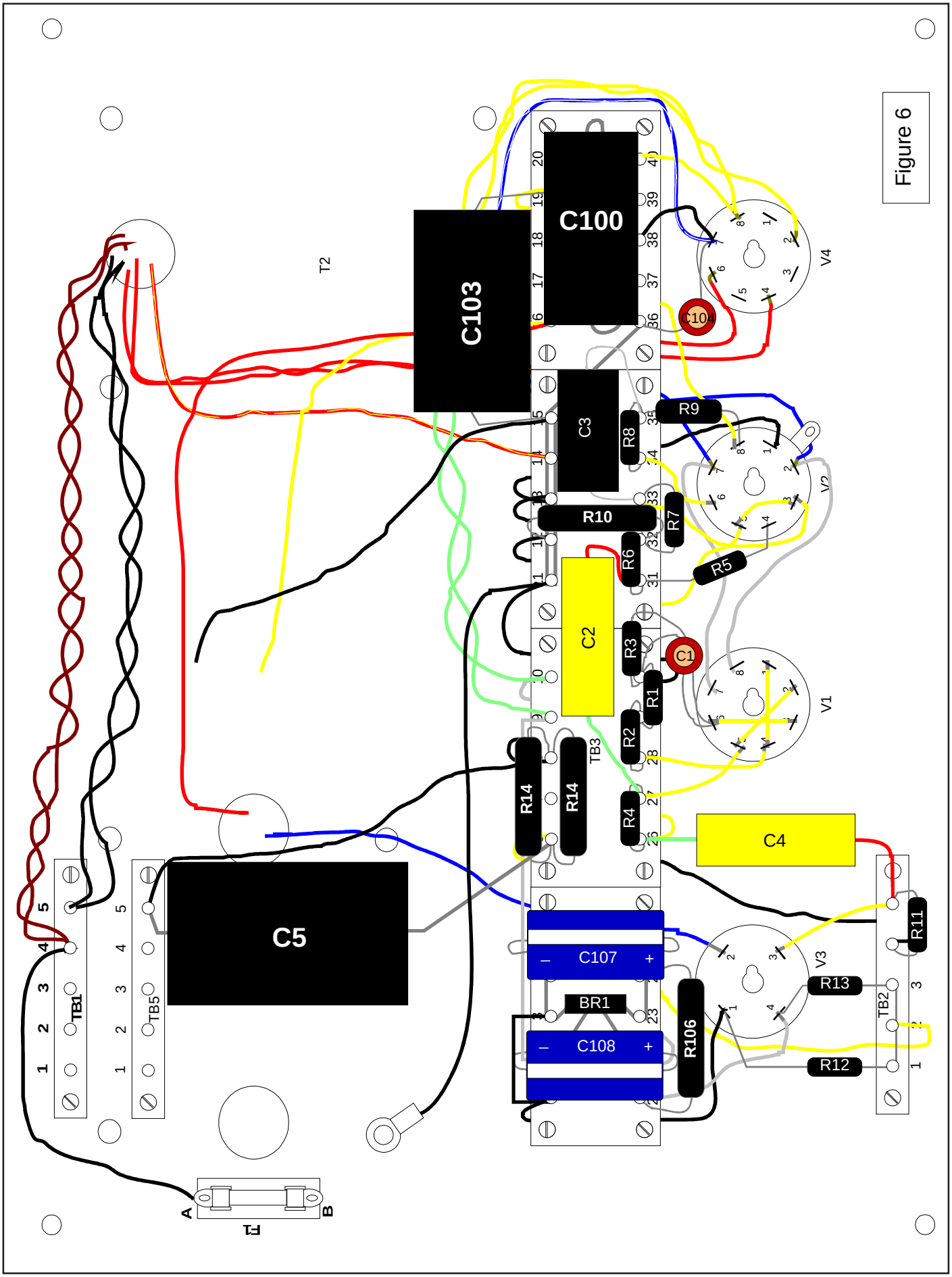

C100
C103
T2
C104
V4
C3
R8
R9
V2
R10
R7
R6
R5
C2
R3
C1
R1
V1
R2
TB3
R14
R14
R4
C4
C5
C107
BR1
C108
R106
V3
R13
R12
R11
TB2
TB1
TB5
F1
A
B

Figure 6

9) This is the final phase of the assembly process. Refer to figures 7, 8 and 9 for this phase.

Using the white coax cable, cut a length approximately 12 inches long. Strip off approximately 1 inch of the outer jacket so the silver braid is exposed. Using a pin, or some other small pointed device, slowly tease the braid starting at the cut end until it is completely unbraided. Pull the unbraided wire to one side of the cable and twist. Strip off approximately 1/8 inch of the center wire's insulation and solder this wire to the center lug of the rca jack. Solder the twisted coax shield to the rca ground plate. Solder a separate black ground wire approximately 12 inches in length to the rca ground plate as well.

Cut a length of yellow hookup wire approximately 8 inches in length and solder this wire to the positive (red) binding post terminal. Do not install the insulators yet as they may melt when soldering the wires to the posts.

Cut two lengths of black hookup wire approximately 10 inches in length and solder both of these wires to the negative (black) binding post terminal. Do not install the insulators yet as they may melt when soldering the wires to the posts.

Mount the power switches and IEC connectors to black rear panels.

Cut a piece of black hookup wire approximately 3 inches in length and solder a terminal ring to one end and then solder the other end of the loose wire to the center terminal of the IEC connector.

Cut a length of black hookup wire approximately 8 inches in length, twist and solder one end to an outer terminal of the IEC connector. Cut a short length of wire and solder it between the last IEC terminal and an outer lug of the on-off switch.

Cut a 3 inch length of black hookup wire and solder it to the center lug of the on-off switch.

Mount the rca jacks and binding posts to the small black plates. The insulating washers should be used with both the rca jacks and binding posts.

10) Attach capacitor C101 to the clamp mounted on the Walnut chassis box. Tighten the clamp around the capacitor.

Solder a short yellow wire between the positive terminal 1 and terminal 2 of capacitor C101.

Carefully mount the brass plate to the walnut base. Secure it with the button head socket screws.

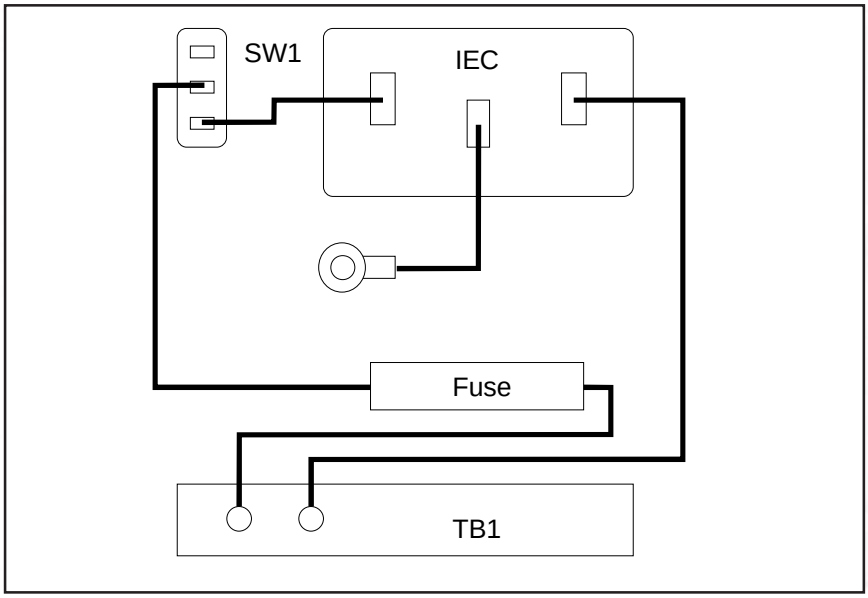


Figure 7. AC Power Connections

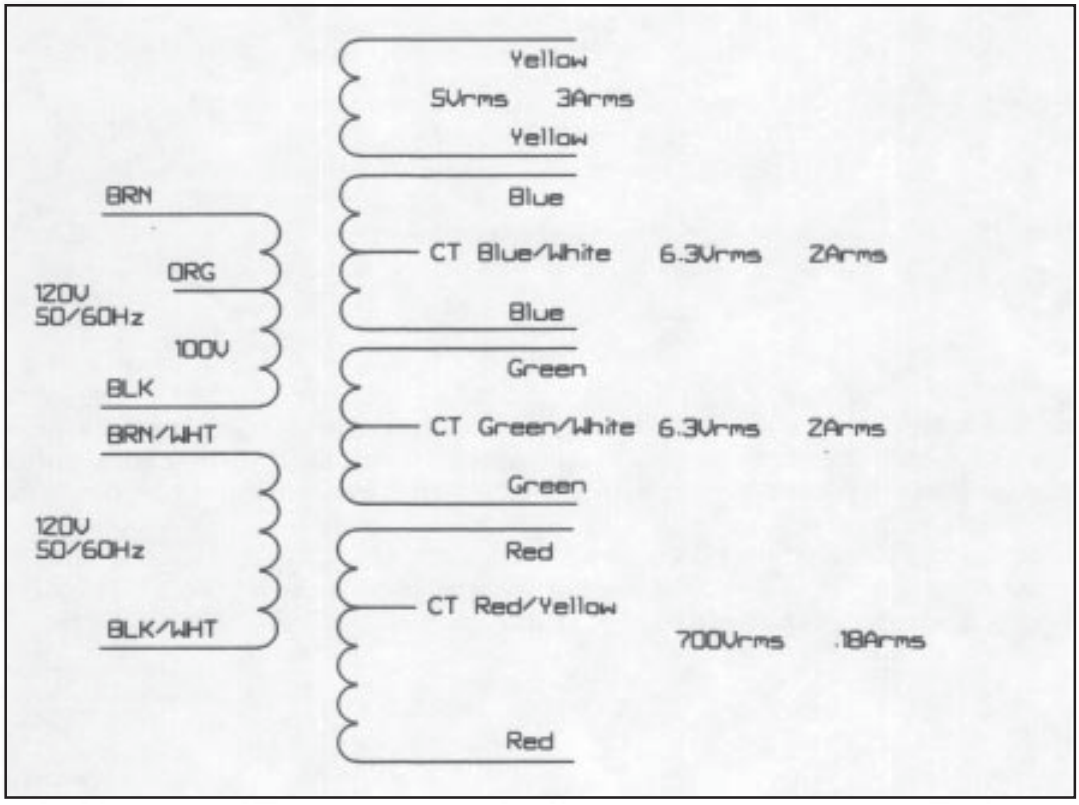


Figure 8. Power Transformer

Solder the black wire previously attached to TB3-15 to the negative terminal of C101.

Solder the yellow wire previously attached to TB3-16 to the postive terminals of C101.

Solder the white lead of inductor L1 to one of the positive terminals on capacitor C101. Solder the black lead of inductor L1 toTB3-40. Be careful not to burn any of the adjacent components with your soldering iron.

11) Mount the plate containing the rca jacks and binding posts to the walnut base and secure it with the brass screws. Be careful not to strip the heads of the brass screws or scratch the rear panel.

Solder the black wire attached to the center lug of the power switch to F1-B.

Solder the black wire attached to the outer lug of the IEC connector to TB1-5.

Place the black wire with the ring terminal end over the mounting stud of T1, as shown in figure 9, and secure with a brass nut.

As shown in figure 9, solder the loose end of the white coax cable to TB3-29. The braid of the coax cable is not connected at this end so just cut it back.

Solder the loose end of the black ground wire, attached to the rca's ground plate, to TB3-30.

Route one of the black wires, attached to the negative binding post, under terminal board TB3 and solder the loose end to terminal TB3-14.

Solder the other black wire, attached to the negative binding post, to TB5-4 (8ohms).

Solder the yellow lead attached to the positive binding post to TB5-1 (8 ohms).

Install the 1.5 amp slow blow fuse in the fuseholder F1.

This completes the assembly phase of the Laurel IIX. Now is a good time to go back and check and double-check your work. This can be very tedious but it can also save time and money if you find your errors now instead of later. Of course applying power to the unit is usually the fastest way to find out your mistakes...just look for the smoke...but not the cheapest or best way!

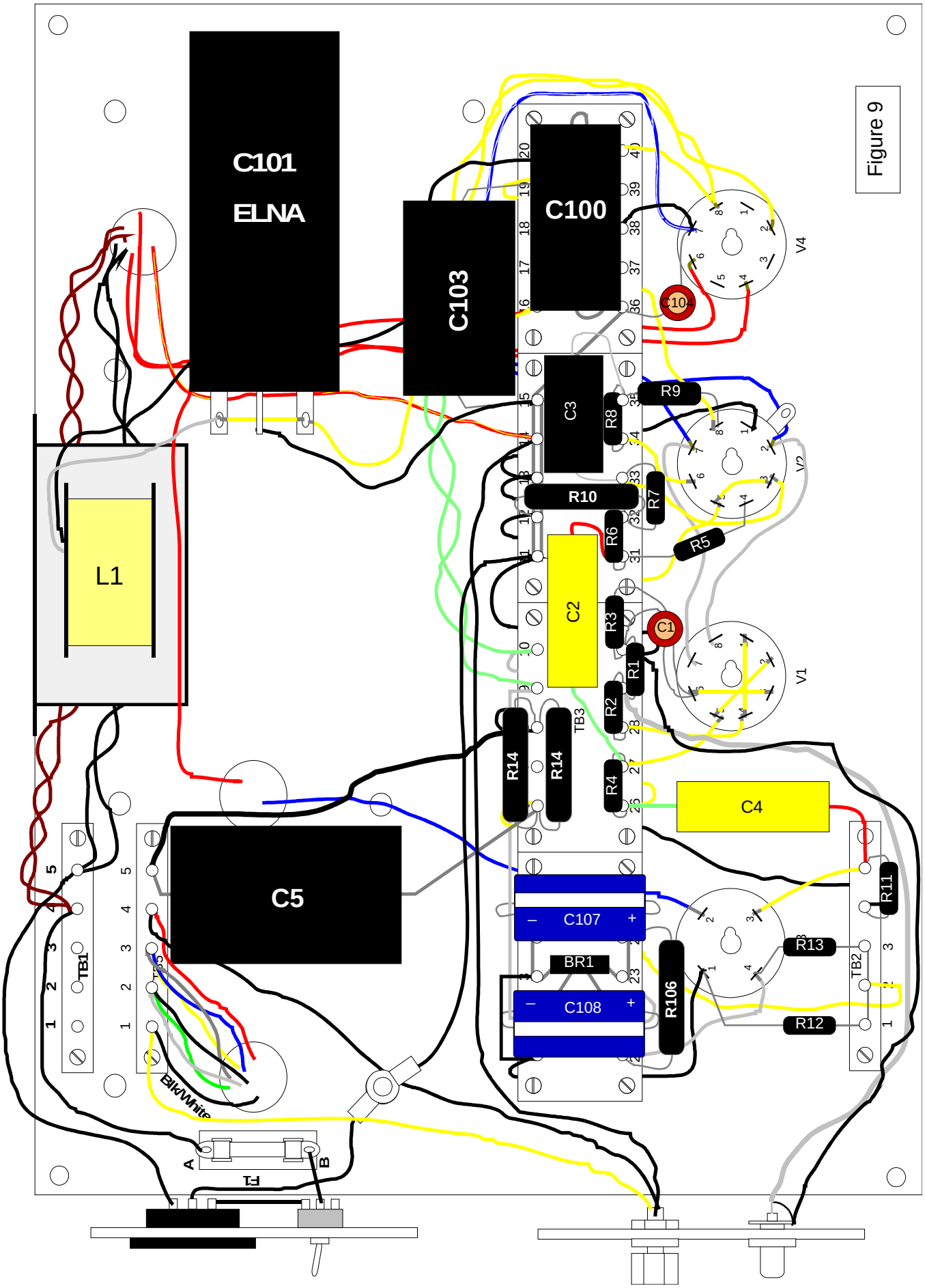

C101
ELNA
C103
C100
C104
V4
R9
C3
R8
R10
R7
R6
R5
V2
L1
C2
R3
C1
R1
V1
R2
TB3
R14
R14
R4
C4
C5
C107
BR1
C108
R106
R13
R12
R11
TB1
TB2
Blk/White
A
B
F1

Figure 9

Power Up and Test Instructions

Power-up Sequence

1) It is recommended that you connect the amplifier to a dummy load or old set of speakers during the power-up procedure. The amplifier must have tubes installed to power-up and test operation.

2) If you own or have access to a variable ac transformer, use it to slowly increase the ac voltage during power-up. Monitor the B+ voltage, using a dc voltmeter, as you increase the ac voltage. Refer to figures 1 and 2 for the proper voltages. If you do not have access to variable transformer, use the voltmeter to measure the B+ voltage as you power-up the amplifier. If the B+ does not show signs of increasing after 4 or 5 seconds, immediately turn off the power. To measure the B+ voltage connect the red or positive lead of your voltmeter to one of the positive lugs of capacitor C101. Connect the negative or black lead of your voltmeter to the negative lug of capacitor C101. Set the voltmeter for a "DC Volts" reading and for a voltage range of 500 volts or more. Upon full power you should measure approximately 415 volts. This value may vary by as much as plus or minus 15 volts depending upon the ac line voltage in your area.

   If the B+ voltage checks OK, next measure the voltage across capacitor C5. Connect the positive lead of your voltmeter to TB3-6 and the negative lead of the meter to TB3-8. Set the voltage range on the meter to the 100 volt scale. You should measure approximately 65 volts. Once again this value may very by as much as plus or minus 5 volts.

   Next check the 300B filament voltage. Connect the positive lead of your voltmeter to V3-4 and the negative lead to V3-1. You should measure 4.5 to 5 volts depending on the type of 300B tube used. Most 300Bs will measure 5 volts, the KR Enterprise VV300Bs will measure 4.5 volts.

   Next set your meter to measure ac voltage and connect one lead to V2-2 and the other lead to V2-7. You should measure approximately 6.3 volts.

3) If all the above voltages measure OK, and you are connected to a set of speakers, listen for excessive noise, oscillations or hum.
4) If there is no excessive noise, you are now ready to give the amps a listen.

Troubleshooting

Problem:	Low or no B+	Check the polarity of all electrolytic capacitors.
Problem:	No Sound	Are the tubes glowing? Are your speakers properly connected?
Problem:	Excessive Hum	Possible ground loop in circuit or chassis may not be grounded. Check all ground wiring. Check filament voltages and wiring. Check all tubes.
Problem:	Popping Noise	Possible cold or weak solder joint or loose connections. Check all solder connections.

If you have difficulty troubleshooting your equipment, give us a call. We will be glad to help you get your equipment running. We have a very high success rate at troubleshooting equipment problems over the telephone however phone calls can be expensive and they will be on your nickel, not ours. A letter or e-mail might be more appropriate, but in either case it will help if you have taken the time to write down as many symptoms as possible and also take and record some voltage measurements at key nodes in the circuit. If all else fails, you can send your amplifier to us, however this should be your last resort.

We have built an tested this amplifier and it works and therefore we have to assume that if your amplifier does not work, it is most likely something you did wrong during assembly. We charge a flat rate of $35 per hour for repairs.

Final Notes

Several different types of tubes can be used with your Laurel amplifier. The most obvious is the 300B tube. You can safely use the Sovtek, Golden Dragon (or regular Chinese), and Western Electric 300B tubes. Also available as an option are the KR Enterprise VV300B and VV32B tubes. The GZ37 and 5U4G rectifier tubes can be substituted for the 5AR4, however the B+ voltages will be slightly lower. And finally, the 6SN7 can be substituted for the 6SL7. To use the 6SN7 tube you must change the value of R3 to 2.2kohms.

Allow the amplifiers to warmup for several minutes prior to using them. This will guarantee the amps are operating under optimum conditions. One note: the Laurel amplifiers are designed to be "dead silent" with respect to ac hum. While I personally haven't used the monoblocks with speakers in the 105dB sensitivity range, I have used them with speakers in the 94 to 100dB range and no hum should be audible with the ear positioned approximately 1 foot from the speaker. If you experience hum with your Laurel monoblocks, go back and revisit the ground wiring. Did you follow our wiring diagram exactly? 99.9% of the time, hum can be attributed to a ground problem, so this is the place to look first.

The Laurel amplifiers are designed to require a minimum amount of maintenance. There are no adjustments to make, you just plug in the tubes turn on the power and enjoy. If your amps are supplied with the walnut boxes you will need to oil the boxes maybe once a year. Use a good quality furniture oil such as Formby's, Watco, or a thinned linseed oil. A light application of a window cleaner, such as Windex, can be used to remove dust and dirt from the brass plates.

No doubt many of you will look at this amp with an eye on making component changes or circuit modifications. If you purchased this amplifier pre-assembled, this will void the warranty. If you have built the kit version, then go for it!

My experience with this design has led me to believe the mu-stage is very neutral providing an "open window" for the signal to pass. As a result, modifications and component changes in the mu-stage area have proven to be relatively uneventful. However, the coupling caps C1 and C4 are good candidates for experimentation. The output stage and power supply are also good areas to play. Experimenting here with different types of resistors, capacitors and tubes can result in audible differences.

Have fun with your experimentation and listening. I hope you receive many years of enjoyment from your purchase.

Peace and Happiness,

Ron Welborne
Welborne Labs