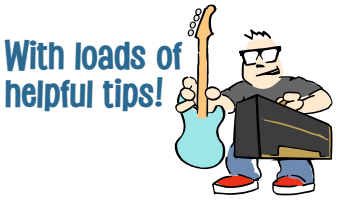
’62 BRIT-PLEX 45W
AMPLIFIER KIT
ORIGINAL BRITISH CIRCUIT

The amp that started a revolution

ASSEMBLY INSTRUCTIONS



StewMac® ICON KITS

Contents

’62 BRIT-PLEX 45W

AMPLIFIER KIT ORIGINAL BRITISH CIRCUIT

Iconic British tone is now in your hands

Be excited!

Your new StewMac ’62 Brit-Plex will be a blast to play through and even more fun to build.

This amp is favored by blues and rock guitarists for its rich, articulate clean tones and exceptional sustain: creamy, warm and a little crispy. Rich in harmonic feedback, this was the amp that started a rock and roll revolution.

This amp is an ICON

This is the JTM45 circuit, the very first circuit produced by Marshall and modeled after a 5F6A Fender Bassman. To keep the weight manageable, this amp was designed as a head to pair with a separate 4x12 speaker cabinet.

By the mid-60s the JTM45 had taken the crown from the AC30 as the must-have British amp. While it might not have as much grit and guts as the subsequent Marshall amps, this is the seminal circuit of a musical empire.

StewMac® ICON KITS

StewMac ICON KITS bring classics that are no longer made, or are simply unaffordable, within reach. And the best part is you get to build them with your own hands.

We give painstaking attention to parts selection, authentic materials, and instantly recognizable details—everything that makes the originals so sought after.

Build it with StewMac

These immersive instructions walk you through every step of creating your ’62 Brit-Plex. And you’ll learn a lot, gaining a deep knowledge of your amp’s inner workings.

Follow our steps closely for safety, too: we’ve carefully laid out a path that even newcomers can follow in handling electrical components.

Building an amp can seem daunting, but nobody makes it easier than StewMac. Watch for helpful tips along the way, too—we’re here to help!

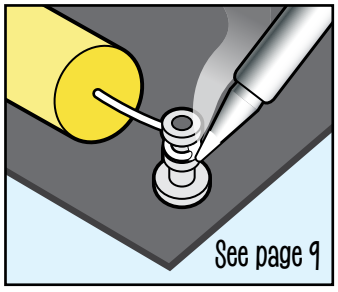
Here's how to build this amp!

Quick look:

Sort your components by type, using the **parts list**.

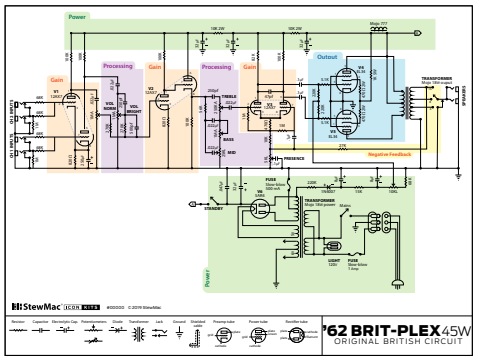
Get the **turret board** ready, starting at **Step 1** on page 9.

You'll prep the metal **chassis** too.



Wiring goes like this:

1. First, you'll **wrap** the leads, connecting them without solder.
2. Then **double-check** all the connections. Don't rush!
3. When everything checks out, it's time to **solder**. The numbered steps tell you when.



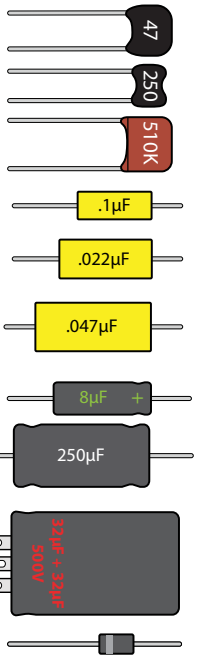
Learn more:
You don't need to read the **schematic**, but it's fun! See how your guitar's signal gets processed into sound on **page 49**.

Parts list

Resistors

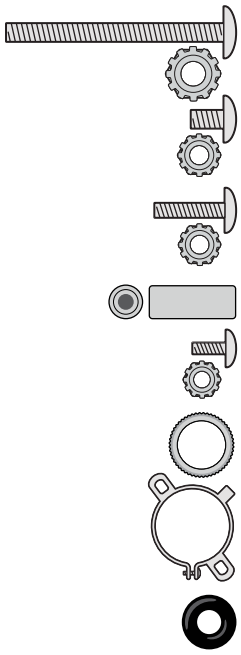
- ☐ (1) 470Ω .5W carbon composite
- ☐ (2) 820Ω .5W carbon composite
- ☐ (2) 5.1K .5W carbon composite
- ☐ (1) 10K .5W carbon composite
- ☐ (1) 15K .5W carbon composite
- ☐ (1) 27K .5W carbon composite
- ☐ (1) 47K .5W carbon composite
- ☐ (1) 56K .5W carbon composite
- ☐ (5) 68K .5W carbon composite
- ☐ (2) 82K .5W carbon composite
- ☐ (5) 100K .5W carbon composite
- ☐ (3) 220K .5W carbon composite
- ☐ (2) 270K .5W carbon composite
- ☐ (4) 1M .5W carbon composite
- ☐ (2) 470Ω 2W metal oxide
- ☐ (2) 10K 2W metal oxide
- ☐ (1) 1K 5W ceramic

Capacitors & diode

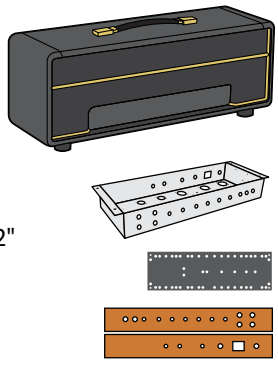


- ☐ (1) 47pF 500V silver mica
- ☐ (2) 250pF 500V silver mica
- ☐ (1) 500pF 500V silver mica
- ☐ (4) .1µF 600V Mojo Dijon
- ☐ (5) .022µF 600V Mojo Dijon
- ☐ (1) .047µF 600V Mojo Dijon
- ☐ (2) 8µF 150V Sprague Atom
- ☐ (1) 250µF 25V aluminum electrolytic
- ☐ (2) 32µF+32µF 500V electrolytic filter cap (also called a can capacitor)
- ☐ (1) 1N4007 1000V rectifier diode

Hardware



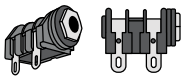
- ☐ (4) 10-32 machine screw, 1-1/2"
- ☐ (4) 10-32 locknut
- ☐ (6) 8-32 machine screw, 1/4"
- ☐ (10) 8-32 locknut
- ☐ (4) 6-32 machine screw, 1/2"
- ☐ (4) 6-32 locknut
- ☐ (4) 4-40 threaded standoff, 1/2"
- ☐ (14) 4-40 machine screw, 1/4"
- ☐ (6) 4-40 locknut
- ☐ (2) Switch mounting nut
- ☐ (2) Filter cap mounting clamp
- ☐ (3) Rubber grommet



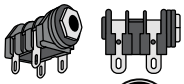
- ☐ (1) Cabinet
- ☐ (1) Chassis
- ☐ (1) Turret board
- ☐ (1) Faceplate/backplate set

Parts list

Tubes, lamps, fuses, and sockets



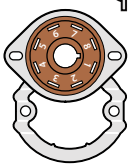
☐ (1) Two-lug jack



☐ (5) Four-lug jack

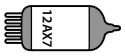
☐ (3) Nine-pin tube socket

☐ (3) Shield for nine-pin tube socket



☐ (3) Eight-pin tube socket

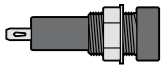
☐ (3) Tension clip for eight-pin socket



☐ (3) 12AX7 preamp tube (also called ECC83S)

☐ (2) EL34 power tube

☐ (1) 5AR4 rectifier tube (also called GZ34)



☐ (2) Fuse socket

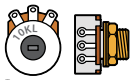
☐ (1) Fuse (3 amp, slow blow)

☐ (1) Fuse (500 milliAmp, fast blow)

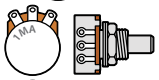
☐ (1) Indicator light

☐ (1) Power inlet

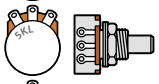
Control pots and more



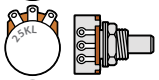
☐ (1) 10KL bias pot



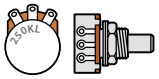
☐ (3) 1M control pot (A-audio taper)



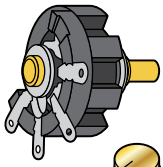
☐ (1) 5K control pot (L-linear taper)



☐ (1) 25K control pot (L-linear taper)



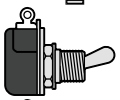
☐ (1) 250K control pot (L-linear taper)



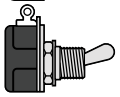
☐ (1) Impedance selector switch

☐ (7) Knob

☐ (3) Three-lug terminal strip



☐ (1) Power switch (2 lugs)



☐ (1) Standby switch (2 lugs)

Wire

☐ (1) Black wire

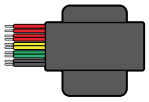
☐ (1) White wire

☐ (1) Green wire

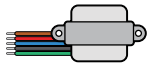
☐ (1) Yellow wire

Vintage-style **push-back wire** lets you push the insulation back instead of trimming it.
BUT: Trimming it still works better!

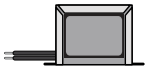
Transformers



☐ (1) Power transformer



☐ (1) Output transformer



☐ (1) Filter choke

Heat-shrink tubing

☐ (3) 1/8″ diameter (2-1/2″ length)

☐ (1) 1/16″ diameter (2-1/2″ length)

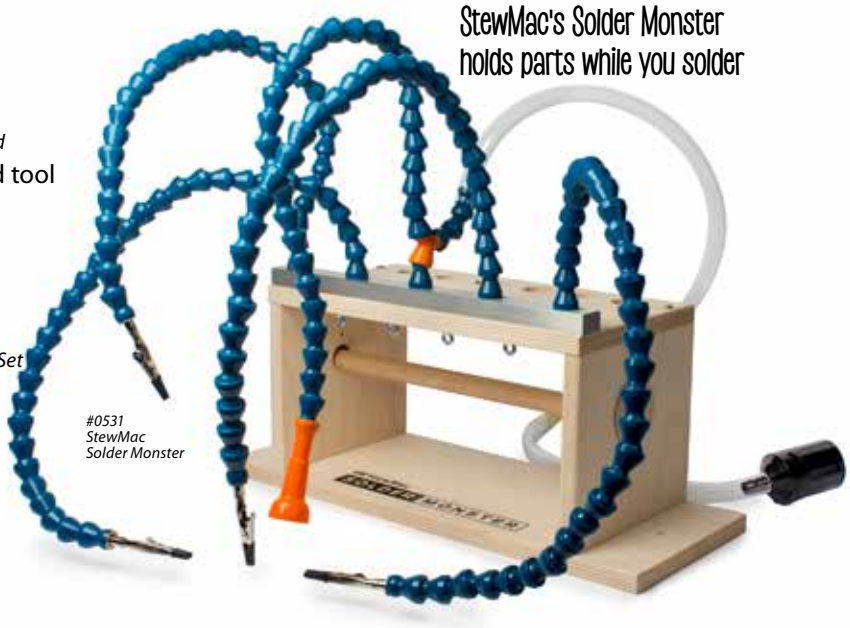
Tools and supplies

Required

- Phillips screwdrivers, #1 and #2
  Item #3000 Guitar Tech Screwdriver Set
- Needle nose pliers
  Item #1610 Long Nose Pliers
- Wire cutter
  Item #1607 Wire Cutter
- Wire stripper
  Item #1606 Wire Stripper
- Soldering iron (preferably 40W)
  Item #0501 Solomon SL-30 Soldering Station
- Solder (at least one Pocket-Pak)
  Item #0505 Kester Pocket-Pak Solder
- Solder sucker
  Item #0503 Solomon Solder Sucker
- Drill with a 5/32" bit
  For mounting turret board and filter cap
- Ruler
  Item #4905 StewMac Shop Rule
- Digital multimeter
  Item #3618 Fieldpiece Pocket Multimeter
- Snuffer stick (bleed resistor)
  Item #1552 Snuffer Stick
- Pencil
- Wooden chopsticks
- Glue
  Wood glue, white glue, or contact cement for gluing a paper label inside the cabinet
- Butane lighter or matches
  For heating heat-shrink tubing
- Contact cement

Helpful

- Round nose bending pliers
  Item #1609 Round Nose Bending Pliers
- Solder wick
  Item #0504 Solder Wick, 5-foot roll
- Soldering aids
  Item #0521 StewMac Soldering Aids
- Soldering stand
  Item #0506 Solomon Soldering Stand
- Solder Monster, or helping hand tool
  Item #0531 StewMac Solder Monster
- Chassis stand
  Item #10750 Chassis Stand
- Printed circuit board vise
- Scratch awl or center punch
  Item #3000 Guitar Tech Screwdriver Set
- Tray for loose parts
- Bias meter for accurate biasing
  Item #1580 VHT Tube Tester + Amp Bias Meter



Amp voltages are seriously dangerous!

High voltage, even when unplugged

When you turn on an amp, the capacitors are designed to take on a charge and hold it. That stored voltage is enough to injure you seriously, or even kill you.

These components aren't a threat until the first time you plug the amp in. The stored electricity can be safely discharged to ground with a snuffer stick. See how to use it below.

Once your amp has been turned on, don't touch the wiring with your bare hands—even after turning it off. If you need to press on a contact, use a chopstick or Sharpie marker, which are both non-conductive. Don't use a pencil, because graphite is conductive.

It's important that you understand the dangers so you're working safely. Here's how to do it right.

Wear rubber-soled shoes

Rubber soles increase the insulation between yourself and the ground.

Take off your ring

A metal ring on your finger can bridge a hot connection to ground.

Professionals who work on amps take these safety habits very seriously

Wear safety glasses

Rosin-core solder sometimes bubbles up, and it can spew molten specks into the air. You don't want molten solder in your eyes.

It's better not to work alone

Electrical shocks can incapacitate you, and having someone available to call 911 can be a lifesaver.

Take breaks and stop when you're tired

Fatigue leads to mistakes, and no one can afford mistakes when working with electricity.

Stay suspicious

Whether it's the first time you've been inside a live amplifier or the 100th time, don't become complacent. If you discharge the caps and walk away for a few minutes, check again for residual voltage when you return. Capacitors can self-charge through a phenomenon known as dielectric memory.

Check before powering on

It's easy to forget that you a left a stray tool or wire in the chassis. It's also easy to forget to re-attach the speaker wire, and that can fry an output transformer in seconds. Constant vigilance is your friend when working on amps.

Always unplug it

Unplug the amp whenever you don't specifically need it plugged in. Some points are always hot when the amp's plugged in, even if the power switch is off. These points include the lugs on the fuse socket, power switch, and standby switch.

How to use a snuffer stick

To discharge a capacitor, clip the snuffer stick lead to ground—preferably a mounting bolt on the power transformer. Hold the tip of the stick to the cap's positive lead and use your multimeter to watch the voltage drain to less than 18V.

How to read resistor values

A resistor's value—the amount of resistance it creates—is rated in ohms (Ω). Larger ohm values mean more resistance. For example, a 100Ω resistor creates ten times as much resistance as a 10Ω resistor.

The resistors used in amplifiers are too small to have value numbers printed on them. Instead, a system of colored bands tells their values. The key to reading these bands is provided below. However, an easier way to decode these bands is to download one of the many smartphone apps for this purpose.

One band will be the nearest to an end of the resistor. That band tells the first value. Combine it with the value of band 2 to get a two-digit number (68 in our example below). Multiply that number by band 3 (68 x 1,000 = 68,000). Thousands are represented by the letter K, so this resistor is 68K (kilo-ohms, or KΩ).

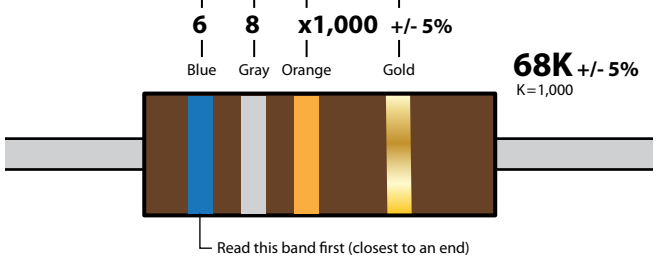
If there is a fourth band, it will be either silver or gold. This indicates the tolerance allowed during manufacturing. The resistors used in this kit have a +/- 5% tolerance, represented by a gold band 4.

A magnifying glass helps a lot. The bands on a 470Ω resistor are yellow/violet/brown, and the bands on a 47K resistor are yellow/violet/orange. They're easily confused!

Can't read the colors?

You can always use a multimeter to test a resistor's value. Set your meter to ohms and connect the test leads on each side of the resistor.

	Band 1 1st Digit	Band 2 2nd Digit	Band 3 Multiplier	Band 4 Tolerance
BLACK	0	0	1	None +/- 20%
BROWN	1	1	10	
RED	2	2	100	
ORANGE	3	3	1,000	
YELLOW	4	4	10,000	
GREEN	5	5	100,000	
BLUE	6	6	1,000,000	
VIOLET	7	7		
GRAY	8	8	0.01	+/- 10% SILVER
WHITE	9	9	0.1	+/- 5% GOLD



Capacitor values

Capacitor values are typically printed on the component. The key values with caps are their capacitance and voltage.

Think of a capacitor as a container that can hold electricity. Capacitance, measured in farads, refers to how much electricity this container can hold—its capacity. One farad (1F) would be much too large for use in an amplifier. Caps for amps are rated in millionths of a farad, called microfarads (µF), or trillionths of a farad: picofarads (pF). The voltage spec for a cap refers to how much DC voltage it can handle at any given time.

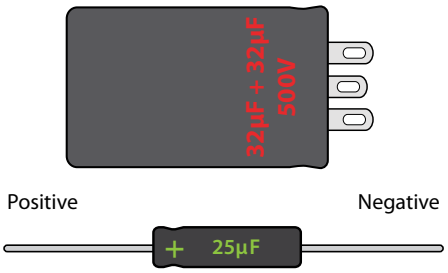
A unique property of capacitors is that they don't allow DC current to flow past them, only AC current. This is important in parts of an amplifier circuit, such as the path between a preamp stage and a power amp stage. Here, a "coupling capacitor" will block DC voltage, allowing only the AC guitar signal to pass.

Filter caps

Capacitors also filter out 60Hz hum, or "ripple," after the AC current from the wall is converted to DC. These capacitors are called filter caps, because they filter out the ripple from a power supply. The filter caps in this amp are the 32µf + 32µf electrolytic can capacitors. This means that each physical capacitor has two caps inside, each with their own positive lug, and they share a common negative lug.

Electrolytic caps

Electrolytic capacitors contain electrolyte: a liquid or gel that gives them a large storage capacity. Electrolytic caps are typically polarized.

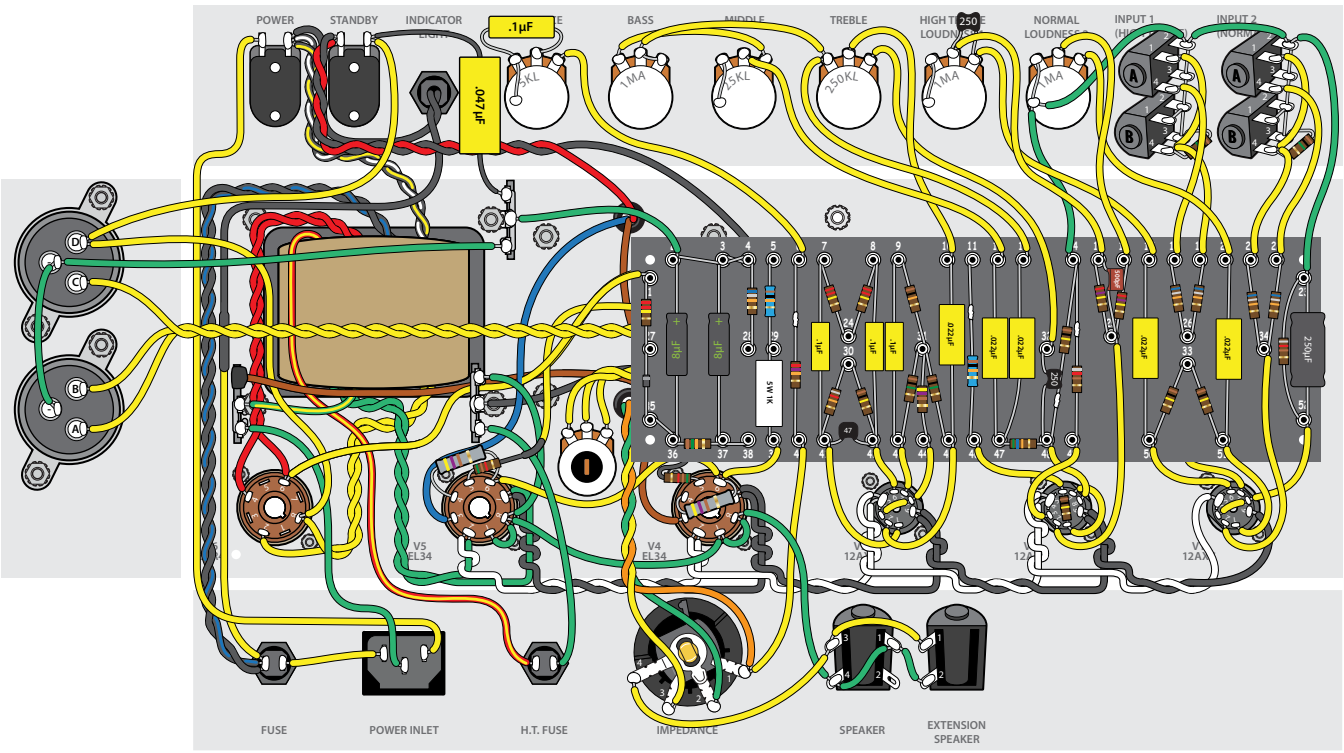


Polarized caps

Some capacitors have polarity and some don't. It's extremely important to install polarized caps correctly in a circuit. The positive lead of an electrolytic cap will be indicated by an indented ring around one edge of the capacitor. The negative lead will often be indicated by a band of arrows pointing to the negative lead.

Installing capacitors with the polarity backwards will make the circuit malfunction and quickly destroy the capacitor—even causing it to explode.

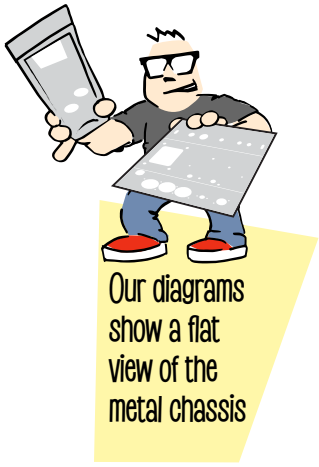
Complete wiring diagram



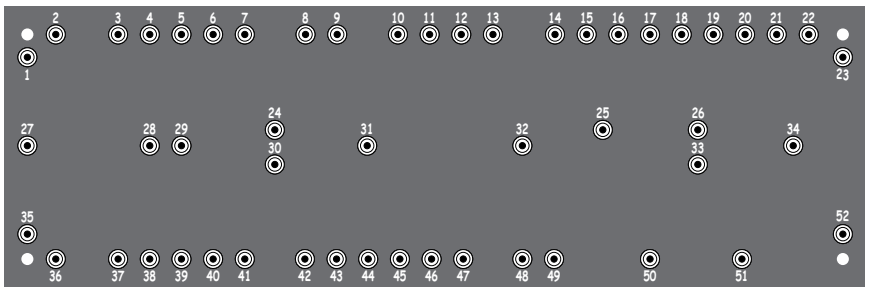
Here's the complete Brit-Plex 45 wiring

When you've finished the kit, you'll have connected all the parts shown in this wiring diagram. If it looks complex now, don't worry; we'll start at the very beginning and do this one step at a time.

Your amp-building skills will get stronger with each step!



Start by prepping the turret board

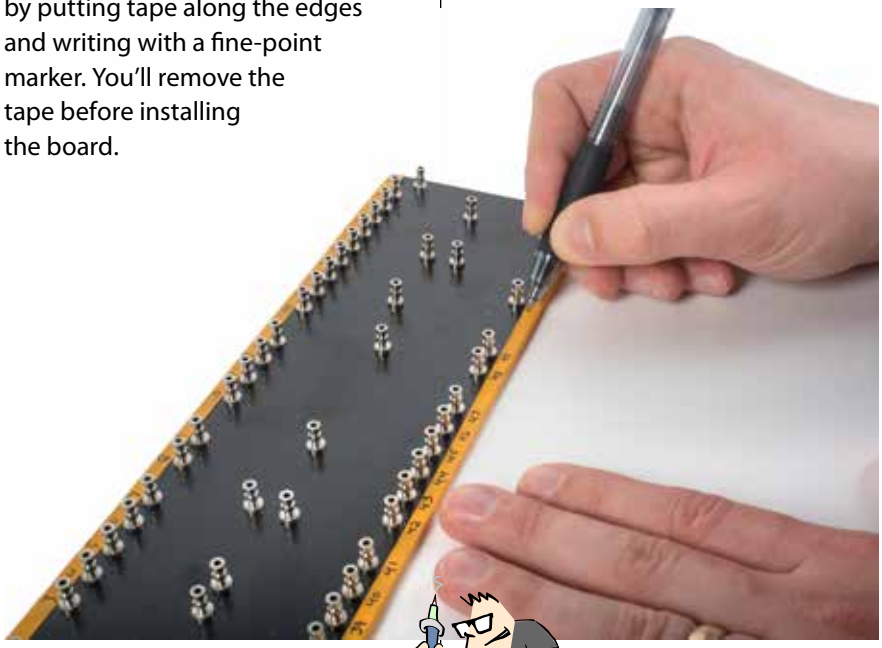


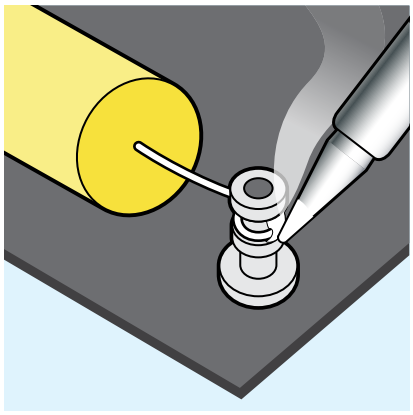
☐ STEP 1

Number the turrets

The steps refer to the turrets by number. Number the turrets on your board by putting tape along the edges and writing with a fine-point marker. You'll remove the tape before installing the board.

Leave the turrets in the center of the board (#24–34) unmarked. You can identify these turrets by referring to the diagrams.





Component leads are wrapped onto the turrets and left unsoldered while you add other parts. This way, you can check your work and make corrections without having to redo a solder joint. Ideally you solder a turret only once, which is the best way to get clean, trouble-free connections.

When it's time to solder, flow the solder all the way around the turret.

You're ready to build!

Tips for great soldering!

❑ Wrap the leads tightly for a good electrical contact before soldering. Don't use solder to "glue" loose joints.

❑ Melt a small amount of solder onto the tip of the iron ("tinning" the iron). Hold the tip against the joint for a few seconds, until the connection reaches soldering temperature.

Also tin component leads like multi-strand wires to help the solder flow.

❑ Keep your soldering tip clean by wiping it often on a damp sponge. Keep it tinned by occasionally melting a little solder onto it.

❑ Feed solder to the connection not to the iron. Keep the iron on the connection for a second longer to allow time for all of the flux to cook out of the joint.

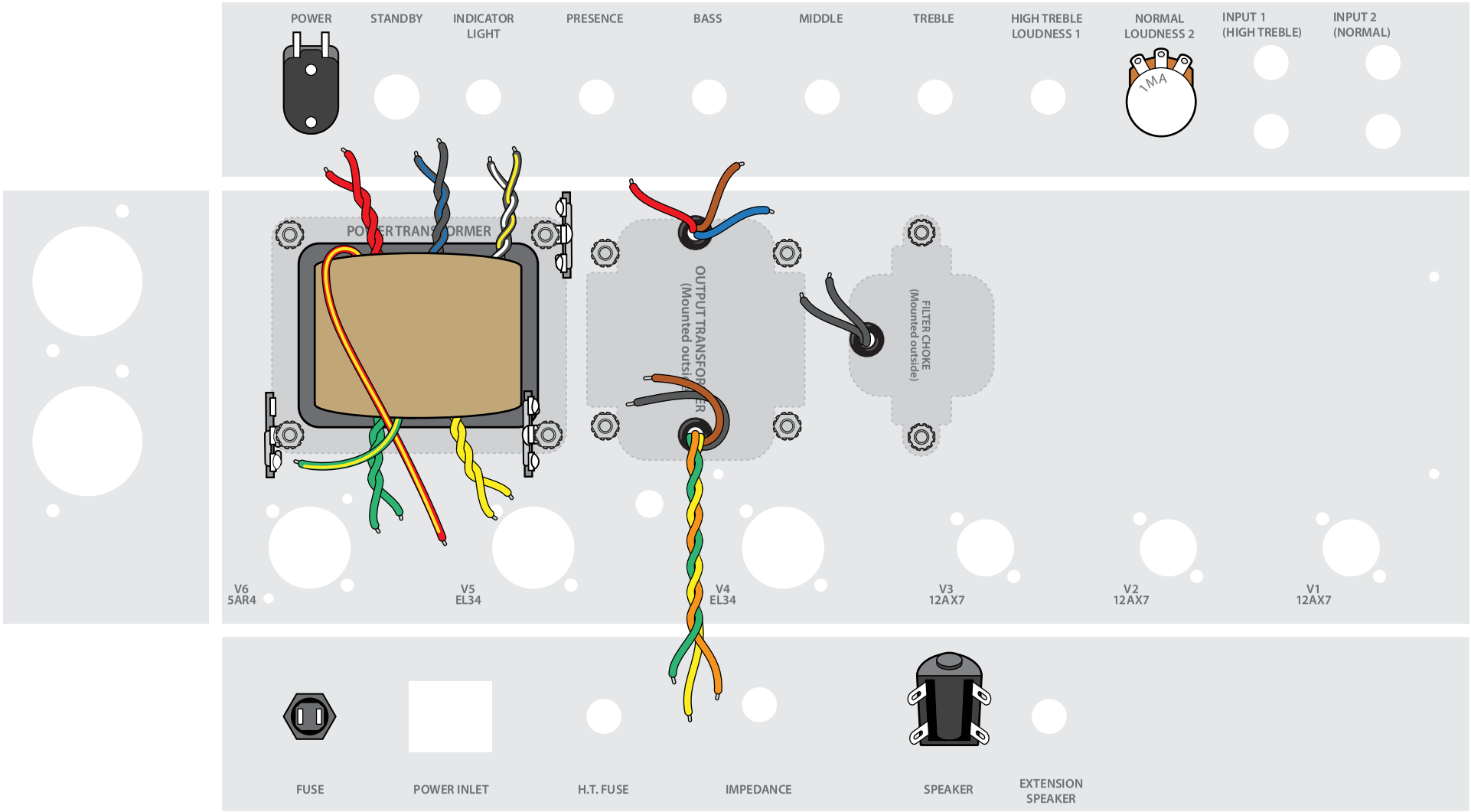
❑ Don't ever blow on the hot solder or touch anything until the joint is completely cool. A good solder joint is shiny—a sign that it was left to cool undisturbed.

❑ Trim away the excess wires after the joint has cooled.

❑ Plan ahead so each joint is only soldered once. Resoldered joints are messy and more likely to fail.

❑ Position the parts so their specs face out so you can read them later. Many builders also align resistor bands to read in the same direction.

❑ How much insulation to strip? With plastic insulation, strip 3/8" from the wire ends. Push-back wire works best when you strip away about 1/4" of the cloth wrap.



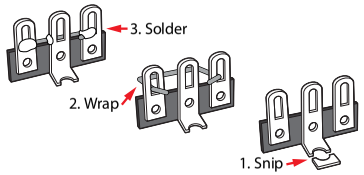
Installing the chassis-mounted components

☐ STEP 2

Mount the faceplate and backplate

Peel the protective film off the chassis, faceplate, and backplate. Secure the faceplate by placing the normal channel loudness control pot (1MA) in its hole and sliding the faceplate over the shaft. Install this pot with the lock washer inside the chassis and the washer and nut outside the chassis. Mount the other end of the faceplate using the power switch, with a hex nut on the inside of the chassis and the washer and switch nut on the outside of the chassis.

Secure the backplate with the four-lug speaker jack and the mains fuse socket. Remove one of the fiber washers from the four-lug speaker jack and install this jack with one fiber washer inside the chassis and the nut and plastic washer outside the chassis. Install the mains fuse socket by removing the nut, sliding the socket through the chassis, and fastening it with the nut.



☐ STEP 3

Prep the three terminal strips

With a wire cutter, snip the mounting holes on the three-lug terminal strips as pictured above.

Cut two 1" pieces of green wire and remove the insulation. Wrap and solder one of the wires across one of the strips, electrically connecting the three lugs. This will be used as a grounding strip. Repeat this process with the second terminal strip. You now have two, three-lug grounding strips.

The third terminal strip will be turned in to a two-lug grounding strip, with one lug left ungrounded.

Cut a 3/4" piece of green wire and remove the insulation. Wrap and solder the wire across two neighboring lugs on this strip. Leave the third lug unconnected. This unconnected lug will be used to terminate an unused transformer winding.

☐ STEP 4

Install three rubber grommets

Squeeze these into the three holes as shown. These provide strain relief for the transformer wires that will pass through the metal chassis.

☐ STEP 5

Mount the power transformer

The power transformer has twelve leads. Separate these into color-coded pairs and twist these pairs together:

- Two red leads
- Two green leads
- Two yellow leads
- Solid black and striped black/blue
- Striped black/yellow and striped black/white

Feed all the transformer leads into the chassis through the square hole with the green leads closest to the tube sockets and the red leads on the same side as the front panel controls.

Install the transformer on the outside of the chassis, using four 8-32 locknuts inside. Add the terminal strips at three corners as shown. The two-lug grounding strip goes on the back corner near the mains fuse socket and the three-lug grounding strips should be placed as shown on the wiring diagram.

Inside a transformer is a primary coil and a secondary coil. Your 120V AC household current goes into the primary coil and is transformed into higher voltage which is output by the secondary coil. This voltage can be as high as 500V, and is referred to as high tension (H.T.). The leads connecting to these two coils are called primary and secondary leads.

☐ STEP 6

Mount the output transformer

One side of the output transformer has blue, red, and brown wires. These are the primary leads of the transformer. Pass these three wires through the grommeted hole closest to the front panel of the chassis.

The other side of the output transformer has orange, green, yellow, brown, and black wires. These are the secondary leads of the transformer. Twist the orange + green + yellow secondary wires together. Pass these through the grommeted hole closest to the back panel, along with the brown and black wires (five wires through this grommet).

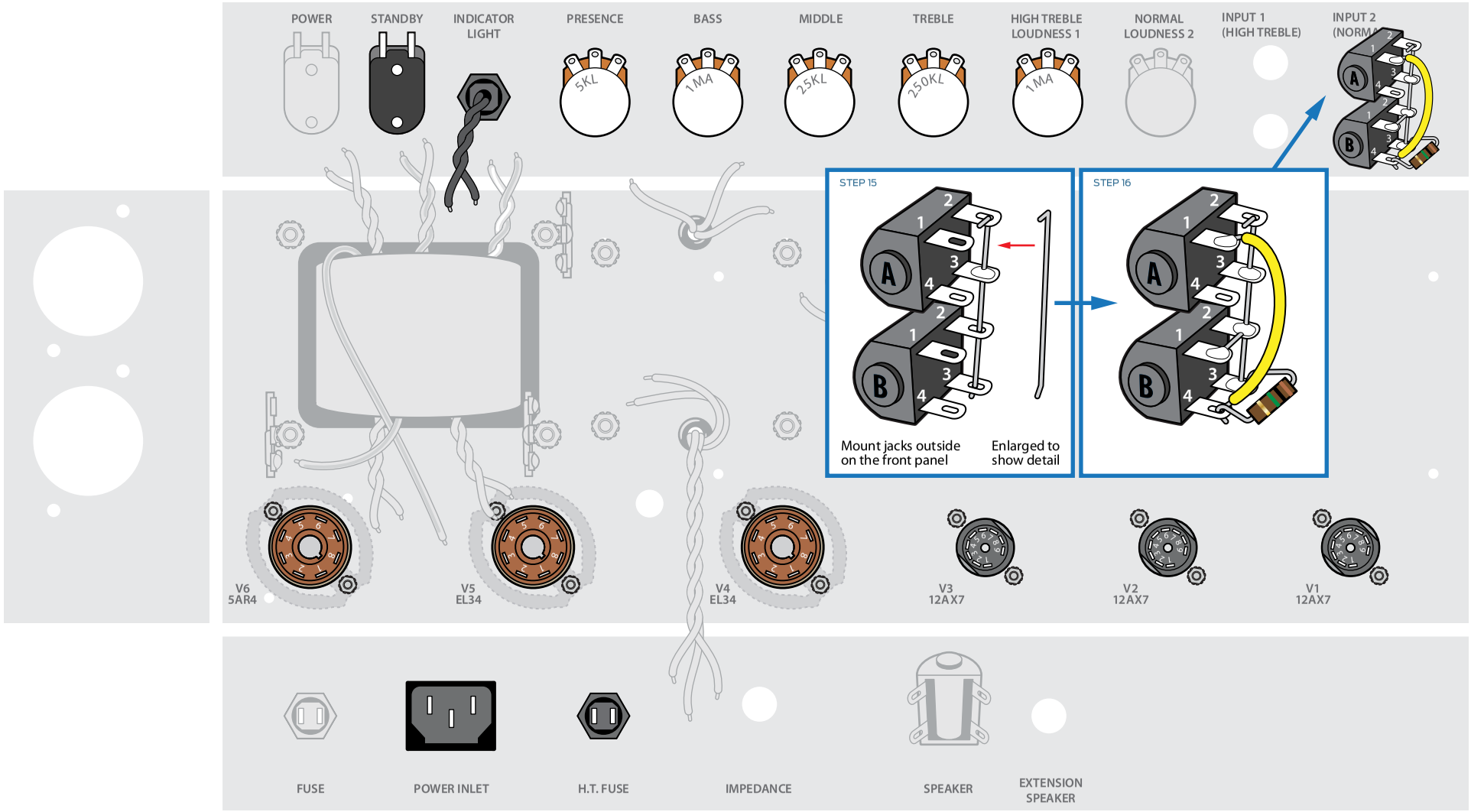
Use four 8-32 x 1/4" machine screws with lock nuts to mount the transformer on the outside of the chassis.

☐ STEP 7

Mount the filter choke

The filter choke is a single-coil transformer, also known as an inductor, that helps smooth out the AC ripple left over in the high voltage signal. This means the filter choke only has two leads, both black. Twist these leads together and thread them through the grommeted hole in the middle of the chassis.

Use two 8-32 machine screws and locknuts to mount the filter choke outside of the chassis.



☐ STEP 8

Install the three large tube sockets with spring retainers

Orient these eight-pin tube sockets so that pin 1 is closest to the rear panel of the chassis.

Use 4-40 x 3/8" machine screws and locknuts to mount these sockets on the outside of the chassis. Include a spring retainer on the bottom of each socket to provide support for these three tubes when they're installed later.

☐ STEP 9

Install the three small tube sockets

Position these nine-pin sockets so pin 1 is closest to the rear panel of the chassis. Use two 4-40 x 1/4" machine screws and locknuts to mount the three remaining tube sockets.

☐ STEP 10

Install the H.T. fuse socket

Install the high-tension fuse socket in the back panel.

☐ STEP 11

Install the power input

Install the power input with its central ground lug facing the chassis opening.

☐ STEP 12

Install the indicator light

Install the indicator light in the front panel and twist the two leads together.

Coil these wires temporarily to keep them out of your way, since they won't be connected until later.

☐ STEP 13

Add the standby switch

Mount the standby switch using the switch mounting nut. After inserting the switch, place its washer on the threaded shaft before adding the nut.

☐ STEP 14

Install the remaining control pots

Mount the control pots so their three lugs are facing the chassis opening. When we refer to these lugs as left or right, it's assuming you're looking at the pot from the same point of view as the wiring diagram.

Mount them as follows:

Presence: 5KL pot
Bass: 1MA pot
Middle (mids): 25KL pot
Treble: 250KL pot
High Treble Loudness: 1MA

☐ STEP 15

Wire the normal channel input jacks

Use two 4-lug jacks for the inputs on the normal channel. For these steps, we'll refer to these input jacks as A and B.

Mount the jacks temporarily on the outside of the chassis, in their respective holes with their lugs pointing toward the indicator light.

Mounting the jacks outside the chassis will hold them in position and give you room to do the tricky job of wiring them up. Afterward, they'll fit nicely inside the chassis as a pre-wired assembly.

In building this amp, you'll cut pieces of wire to make connections. These connecting wires are called jumpers, and you'll use a lot of them in building this amp.

Cut a 2" length of yellow wire. Remove the insulation to create a bare wire jumper.

Bend a small hook on one end and run the long straight end through lug 2 and lug 3 of jack A, and through lug 2 and lug 3 of jack B.

Solder this jumper to lug 3 of jack A.

☐ STEP 16

Normal channel jacks, continued...

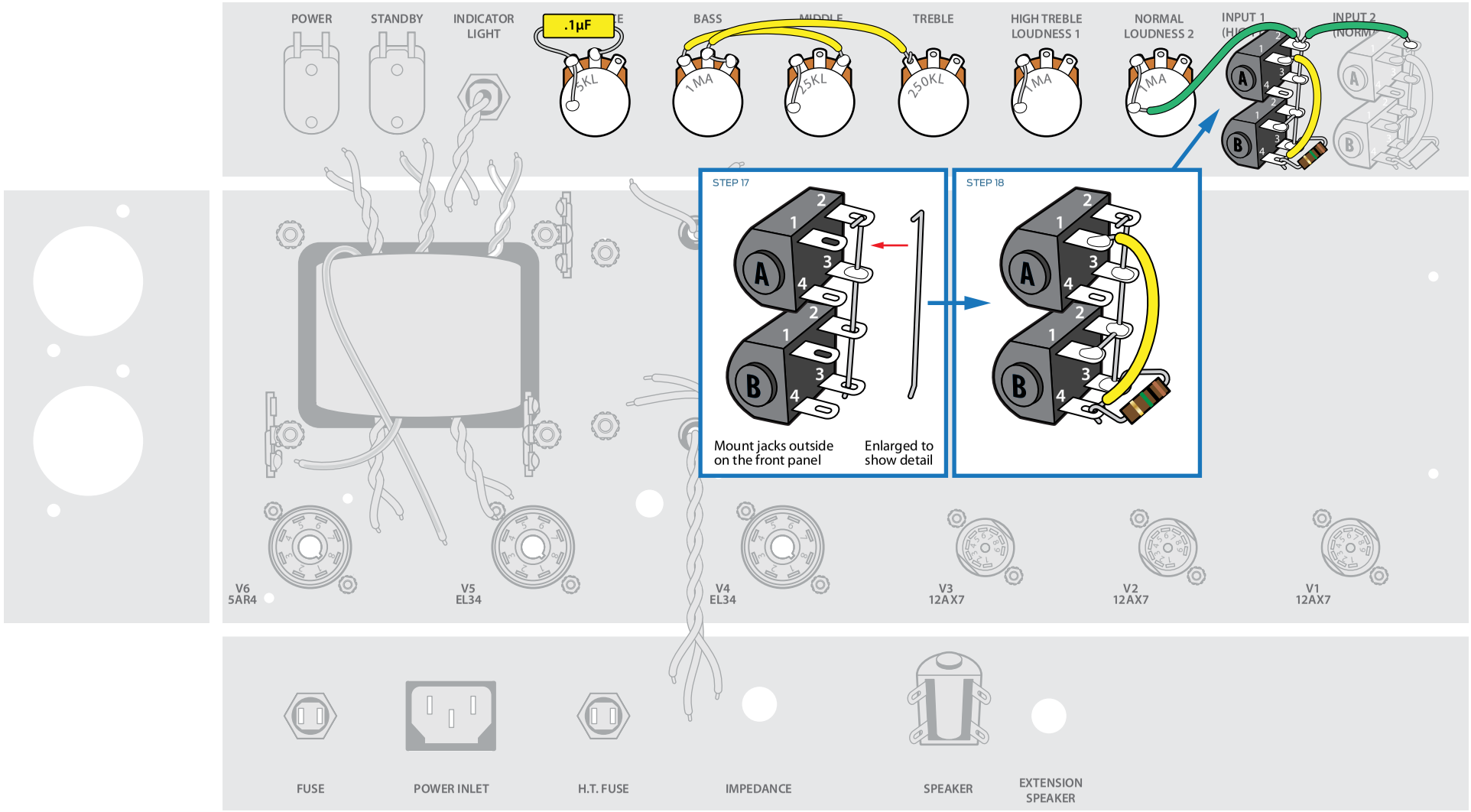
Run one lead of a 1M resistor through lug 3 of jack B and the other lead through lug 4 of jack B.

Solder the resistor lead and jumper lead to lug 3 of jack B and trim away any excess jumper and resistor lead.

Cut a 1" piece of yellow wire and remove the insulation. Run this bare jumper through lug 1 and lug 2 of jack B. Solder this jumper to both lugs.

Cut a 2" yellow jumper and wrap one end to lug 4 of jack B. Solder the other end to lug 1 of jack A.

Remove these wired-up input jacks and mount them in the same holes on the inside of the chassis. (Their lugs are now facing away from the indicator light.)



☐ STEP 17

Wire the high treble channel input jacks

Again, use two 4-lug jacks which we'll refer to as A and B.

As you did with the normal channel jacks, assemble these on the outside of the chassis with their lugs pointing toward the indicator light.

Cut a 2" length of yellow wire. Remove the insulation to create a bare wire jumper.

Bend a small hook on one end and run the long straight end through lug 2 and lug 3 of jack A, and through lug 2 and lug 3 of jack B.

Solder this jumper to lug 3 of jack A.

☐ STEP 18

High treble channel jacks, continued...

Run one lead of a 1M resistor through lug 3 of jack B and the other lead through lug 4 of jack B.

Solder the resistor lead and jumper lead to lug 3 of jack B and trim away any excess jumper and resistor lead.

Cut a 1" piece of yellow wire and remove the insulation. Run this bare jumper through lug 1 and lug 2 of jack B. Solder this jumper to both lugs.

Cut a 2" yellow jumper and wrap one end to lug 4 of jack B. Solder the other end to lug 1 of jack A.

Remove these wired-up input jacks and mount them in the same holes on the inside of the chassis. (Their lugs are now facing away from the indicator light.)

☐ STEP 19

Add two ground jumpers

Cut one 1-3/4" green jumper and wrap one end to lug 2 of the high treble channel jack A. Solder the other end to lug 2 of the normal channel jack A.

Cut a 3" green jumper and wrap one end to lug 2 of the high treble channel jack A. Solder this jumper end in place with the two other jumpers already there. Turn the normal channel loudness pot shaft clockwise to its zero position and solder the other end of this jumper to the back of the normal channel loudness pot.

☐ STEP 20

Ground three control pots

Turn all pot shafts counterclockwise to their zero position before starting this step. This is because you'll be applying heat to their cases, and if the heat lingers too long it could create an impression on the wiper inside. This isn't a concern if the pot is in the zero position.

Cut three 1" jumpers of green wire, pull off their insulation, and bend one end of each in to a hook.

Starting with the normal channel loudness pot solder the hook end of the jumper to the left lug of the pot. Solder the straight end of this jumper to the back of the pot.

Repeat this process for the high treble loudness pot and the mids pot.

☐ STEP 21

Add two yellow jumpers

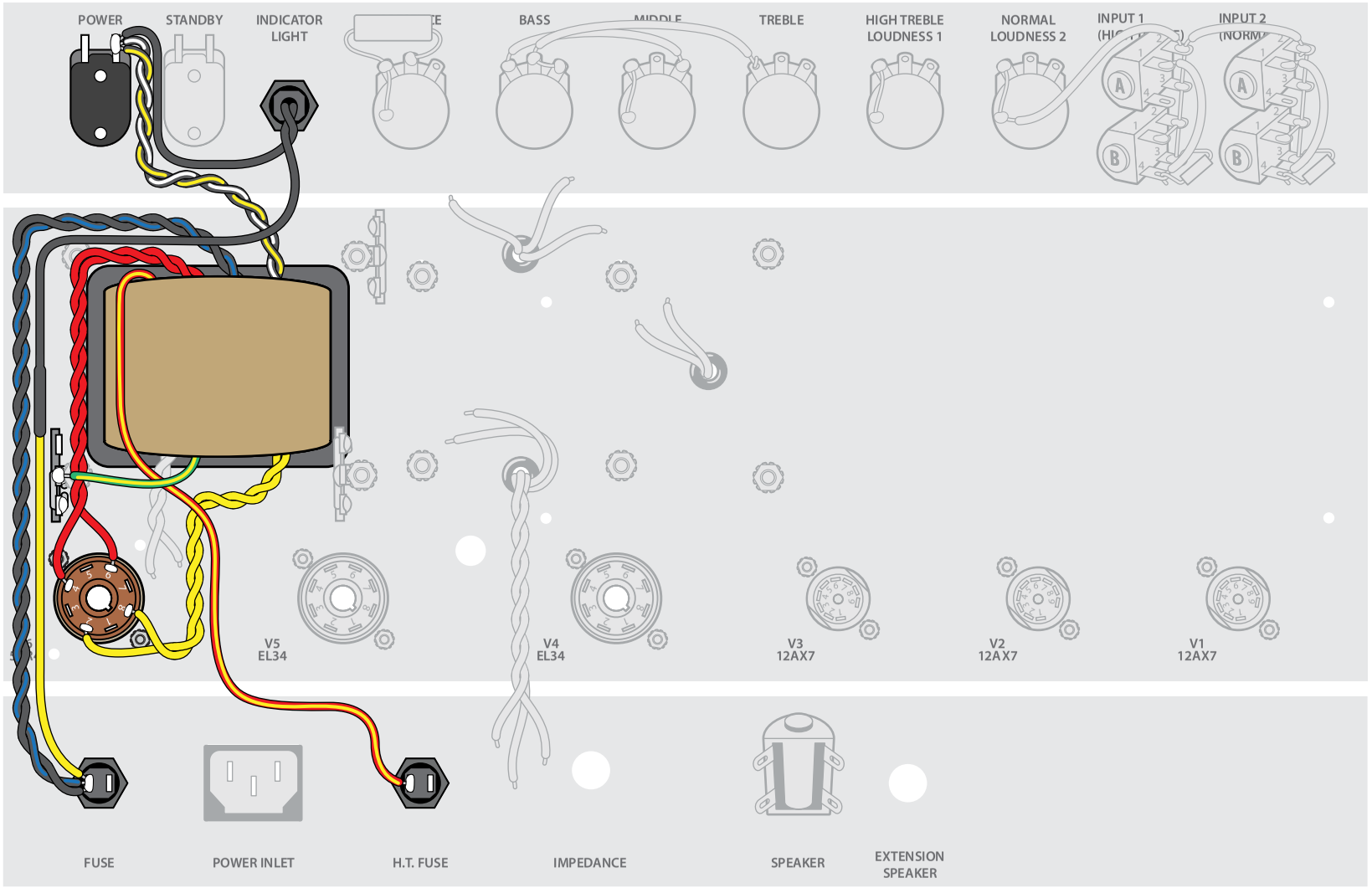
Cut a 4" yellow jumper. Strip 3/4" of insulation from one side. Run this jumper down through the middle lug of the bass pot and back up through the right lug of the bass pot. Solder this jumper to both lugs of the bass pot. Route the other end of this jumper over the mids pot and wrap the other end through the left lug of the treble pot. Don't solder this end yet.

Cut a 3-1/4" yellow jumper and solder one end to the left lug of the bass pot. Solder the other end of this jumper to the right lug of the mids pot.

☐ STEP 22

Add a .1µF capacitor

Solder a .1µF cap between the left lug of the presence pot and the middle lug of the same pot. Bend the capacitor lead from the left lug of the pot to the back of the pot and solder it. Trim away any excess lead at the middle lug and the back of the pot.



☐ STEP 23

Power transformer red leads

Run the two red wires from the power transformer to the V6 rectifier tube socket. Trim these wires to length and solder one to pin 4 and the other to pin 6. Either wire can go to either lug.

☐ STEP 24

Power transformer yellow leads

Run the two yellow wires from the power transformer to the V6 rectifier tube socket. Trim these wires to length and solder one to pin 2 and the other to pin 8. Either wire can go to either lug

☐ STEP 25

Power transformer black and black/blue leads

Run the twisted pair of solid black and striped black/blue power transformer leads to the mains fuse socket and wrap them both to the left lug. Don't solder them yet.

☐ STEP 26

Power transformer black/yellow and black/white leads

Run the twisted pair of striped black/yellow and striped black/white power transformer leads to the right lug of the power switch and wrap them on to the lug. Don't solder them yet.

☐ STEP 27

Power transformer red/yellow lead

Run the striped red/yellow power transformer lead to the H.T. fuse socket, cut it to an appropriate length, and solder it to the left lug.

☐ STEP 28

Power transformer green/yellow lead

Run the striped green/yellow power transformer lead to the two-lug grounding strip next to the mains fuse socket and solder it to the center grounding lug as shown.

☐ STEP 29

Install one pilot-light lead

Cut either one of the pilot light leads to an appropriate length and solder it to the right lug of the power switch along with the striped black/yellow and striped black/white power transformer leads.

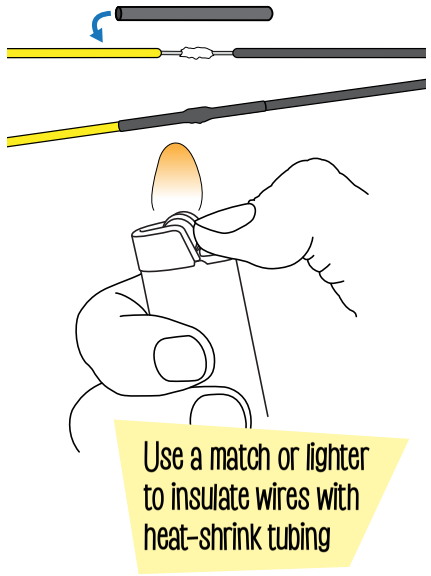
☐ STEP 30

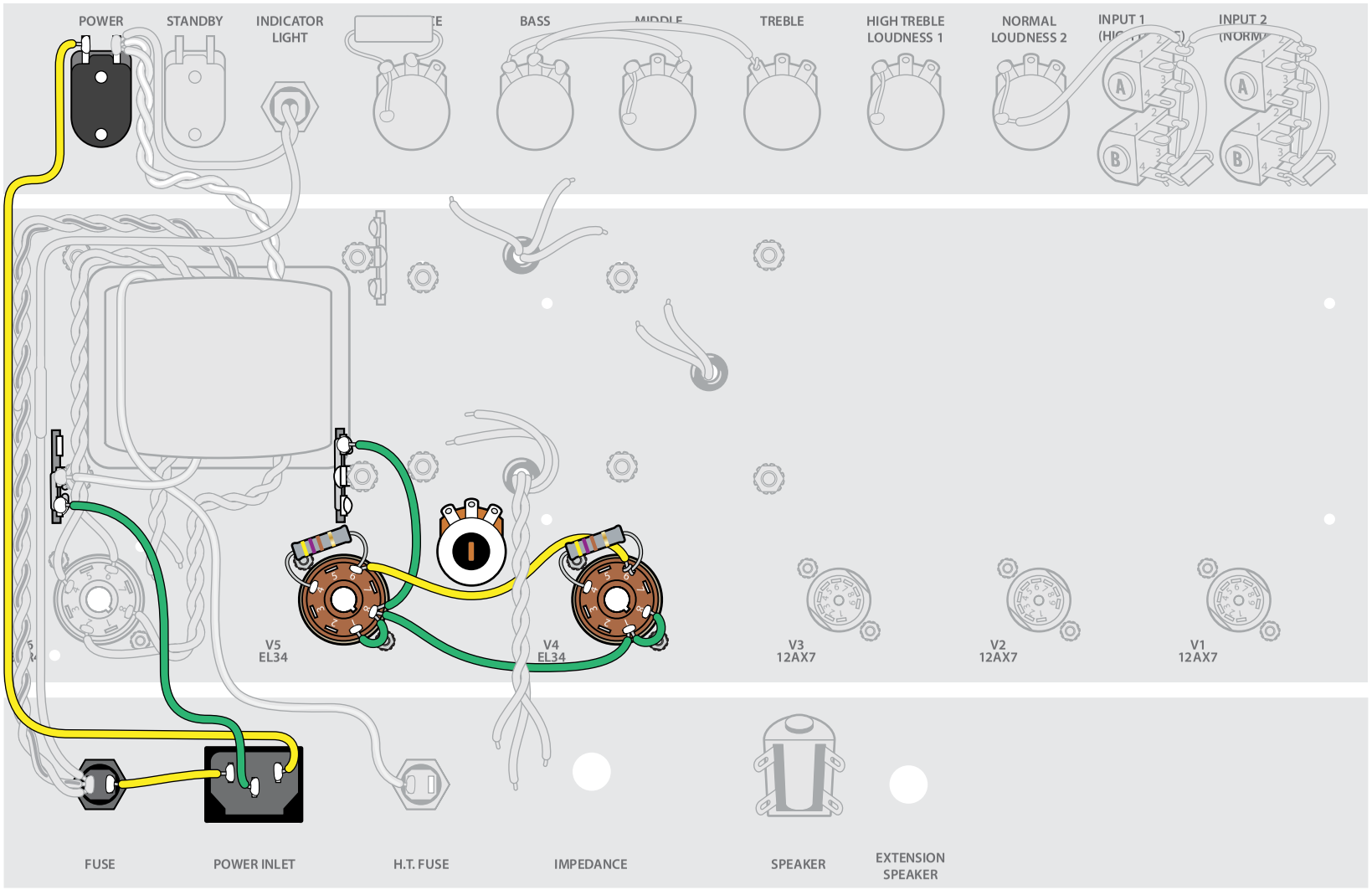
Install the other pilot-light lead

Cut a 5" yellow jumper to be connected to the other pilot light lead. Strip 3/4" of insulation back from both the jumper and the pilot lamp lead, twist the bare wires together, and solder them.

Slide 1" of 1/8" heat-shrink tubing over the solder joint and add heat to create electrical insulation over the bare wire of these soldered leads.

Solder the free end of this jumper to the left lug of the mains fuse socket along with the power transformer leads already wrapped in place.





☐ STEP 31

Add two yellow jumpers

Cut one 14" yellow jumper and solder one end to the right lug of the power input. Run the other end of this jumper around the outside wall of the chassis and solder it to the left lug of the power switch.

Cut one 4" jumper and solder one end to the left lug of the power input. Solder the other end to the right lug of the mains fuse socket.

☐ STEP 32

Add one green jumper

Cut one 3-1/4" green jumper and solder one end in to the middle lug of the power input. Solder the other end to the left lug of the two-lug grounding strip closest to the mains fuse socket.

☐ STEP 33

Install the bias pot

Mount the 10KL bias pot in the floor of the chassis as shown.

☐ STEP 34

Ground the power tube sockets

Cut two 3/4" green jumpers and bend them both into a U shape. Add one jumper between V5 pin 1 and pin 8. Solder this jumper to pin 1. Add the other jumper between V4 pin 1 and pin 8. Solder this jumper to pin 8.

Cut a 4" green jumper. Solder one end to V4 pin 1 along with the jumper in place and wrap the other end to V5 pin 8.

Cut a 3" green jumper and solder one end to V5 pin 8 with the other two jumpers. Solder the other end of this jumper to one of the lugs on the nearby grounding strip.

☐ STEP 35

Add two 470 Ω 2W resistors

These resistors protect the power tubes and the output transformer, and in doing this can get extremely hot. For this reason, they need to be mounted up and away from the tube sockets by 1/2”.

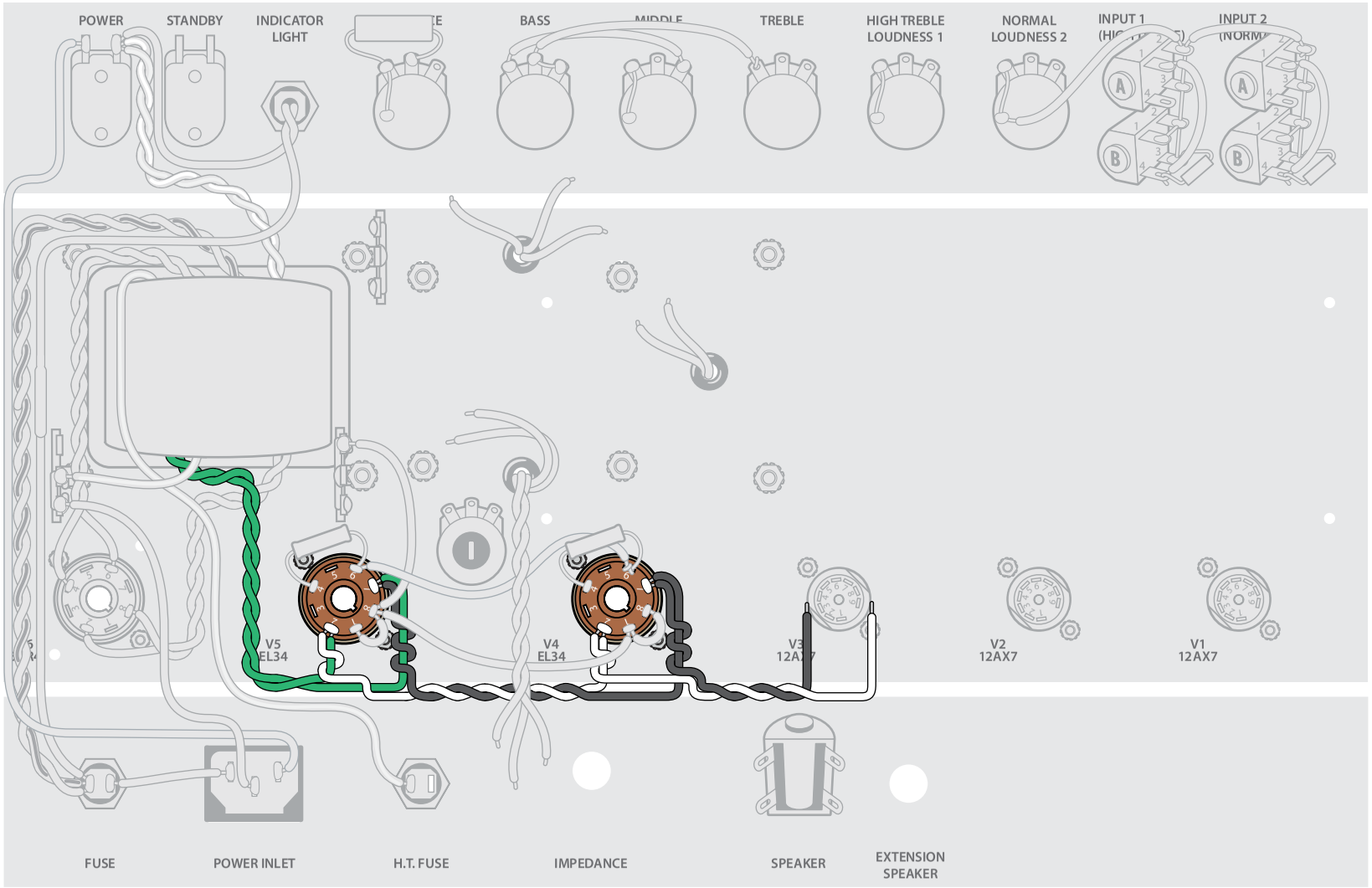
Wrap one lead of the first 470 Ω 2W resistor to pin 4 of V5 and wrap the other lead to pin 6 of V5, standing it up off the tube socket 1/2". Solder the lead wrapped to pin 4.

Wrap one lead of the second 470 Ω resistor to pin 4 of V4 and wrap the other lead to pin 6 of V4, standing it up off the tube socket 1/2". Solder the lead wrapped to pin 4.

☐ STEP 36

Add one yellow jumper

Cut one 4" yellow jumper. Solder one end of the jumper to V5 pin 6 with the resistor lead already in place. Wrap the other end to V4 pin 6, but don't solder it yet.

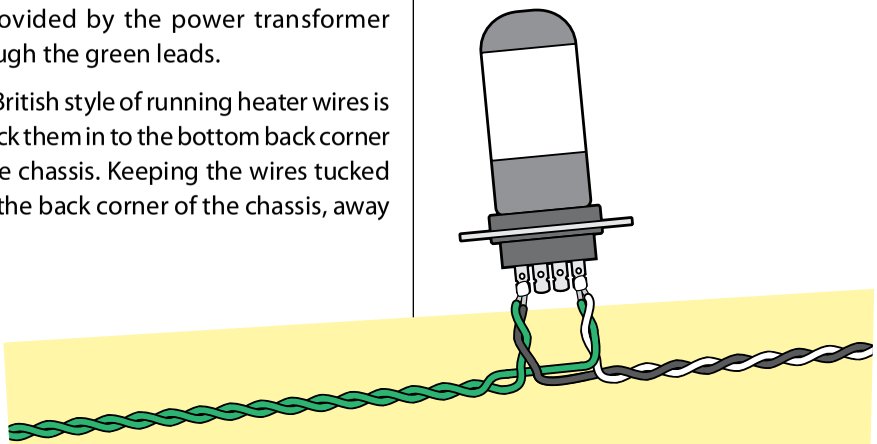


☐ STEP 37

Install the heater wires

Tubes require a 6.3V AC current to power their filaments, which are also called "heaters" in the amp world. This current is provided by the power transformer through the green leads.

The British style of running heater wires is to tuck them in to the bottom back corner of the chassis. Keeping the wires tucked into the back corner of the chassis, away from the signal carrying wires, prevents the AC current in these heater wires from bleeding 60hz hum into your signal.



Use this heater-wire technique to minimize the hum caused by AC voltage

The twisted green wires from the power transformer carry AC voltage to the heating filaments in the tubes. This voltage will cause your amp to hum if these wires are allowed to run too close to signal-carrying wires.

Twist the wires tightly together

This twist isn't for looks; it's an important hum-cancelling technique to reduce noise in your amp. It works in a way similar to the opposite-wound coils in a humbucking pickup.

Route them away

To keep twisted heater wires away from signal-carrying wires, route them in to the back edge of the floor of the chassis. Give them a sharp right angle bend toward the next socket and another sharp bend back down to that socket. This keeps them shielded and away from signal carrying wires.

☐ STEP 38

Connect to socket V5

Run the power transformer green wires to socket V5, keeping them down as close to the chassis as possible.

Cut two 8" heater wires, one white and one black. Twist them together very tightly, leaving about 1" of the ends untwisted. Join the white jumper to either of the green power supply leads by twisting the ends together. Join the black jumper to the other green lead.

Solder the pair with the white wire to pin 2 of socket V5. Solder the pair with the black wire to pin 7 of socket V5. Bend these wires into the back corner of the chassis and then bend the black-and-white pair at a 90° angle toward socket V4.

☐ STEP 39

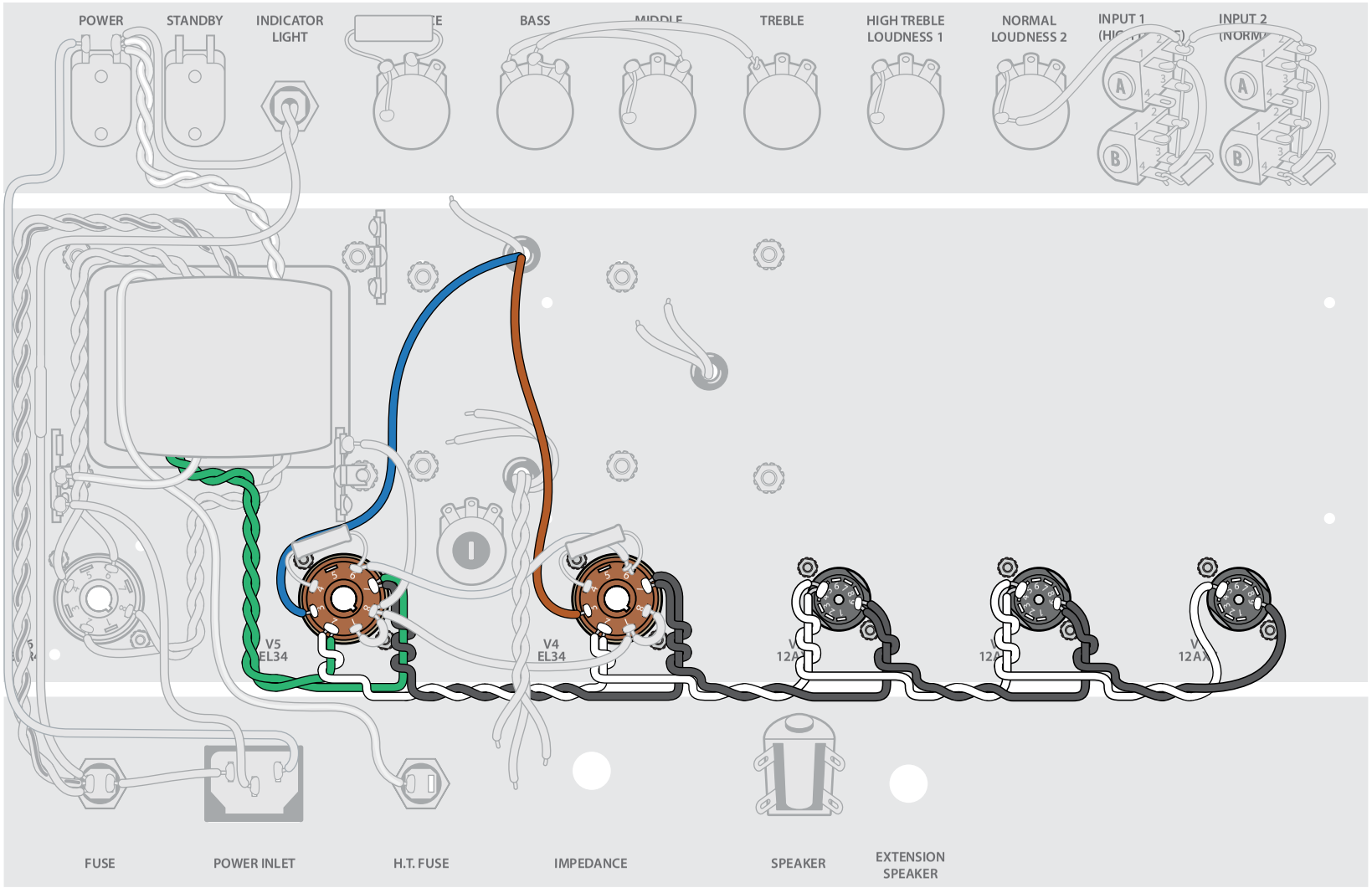
Connect to socket V4

Cut two 7" heater wires, one white and one black. Twist them tightly together.

Twist the end of the white wire to the white jumper coming from V5. Twist the black wire with the black jumper coming from V5.

Solder the white pair onto pin 2 of V4. Solder the black pair onto pin 7. Bend the wires into the back corner of the chassis, and on toward socket V3.

Solder the white pair to pin 2 of socket V4. Solder the black pair to pin 7 of socket V4. Bend these wires into the back corner of the chassis and then bend the black-and-white pair at a 90° angle toward socket V3.



☐ STEP 40

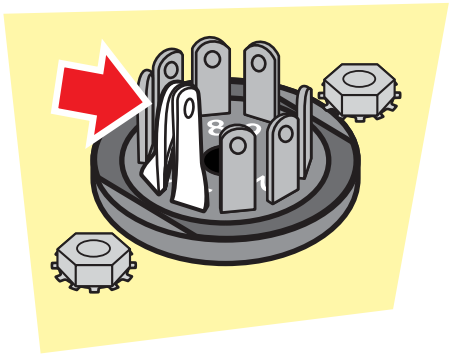
Connect to socket V3

On sockets V3, V2, and V1 you will need to join pins 4 and 5 together. On these three sockets, gently twist pins 4 and pin 5 toward each other so their eyelets line up. Be very careful while doing this as these pins are delicate.

Cut two 7" heater wires, one white and one black. Twist them tightly together.

Twist the end of the white wire together with the white jumper coming from V4. Twist the black wire with the black jumper coming from V4.

Solder the white pair to combined pins 4+5 on V3 and solder the black pair to V3 pin 9. Bend the wires in to the back corner of the chassis, and on toward socket V2.



☐ STEP 41

Connect to socket V2

Cut two 7" heater wires, one white and one black. Twist them tightly together.

Twist the end of the white wire together with the white jumper coming from V3. Twist the black wire with the black jumper coming from V3.

Solder the white pair to combined pins 4+5 on V2 and solder the black pair to V2 pin 9. Bend the wires in to the back corner of the chassis, and on toward socket V1.

☐ STEP 42

Connect to socket V1

Run the black-and-white twisted pair in to the back corner of the chassis and toward V1. Solder the black wire to V1 pin 9 and solder the white wire to V1 pin 4+5.

Carefully inspect each solder joint from this heater wire installation and once the solder joints have cooled push your heater wires in to the floor of the chassis and in to the back corner of the chassis as much as you can.

☐ STEP 43

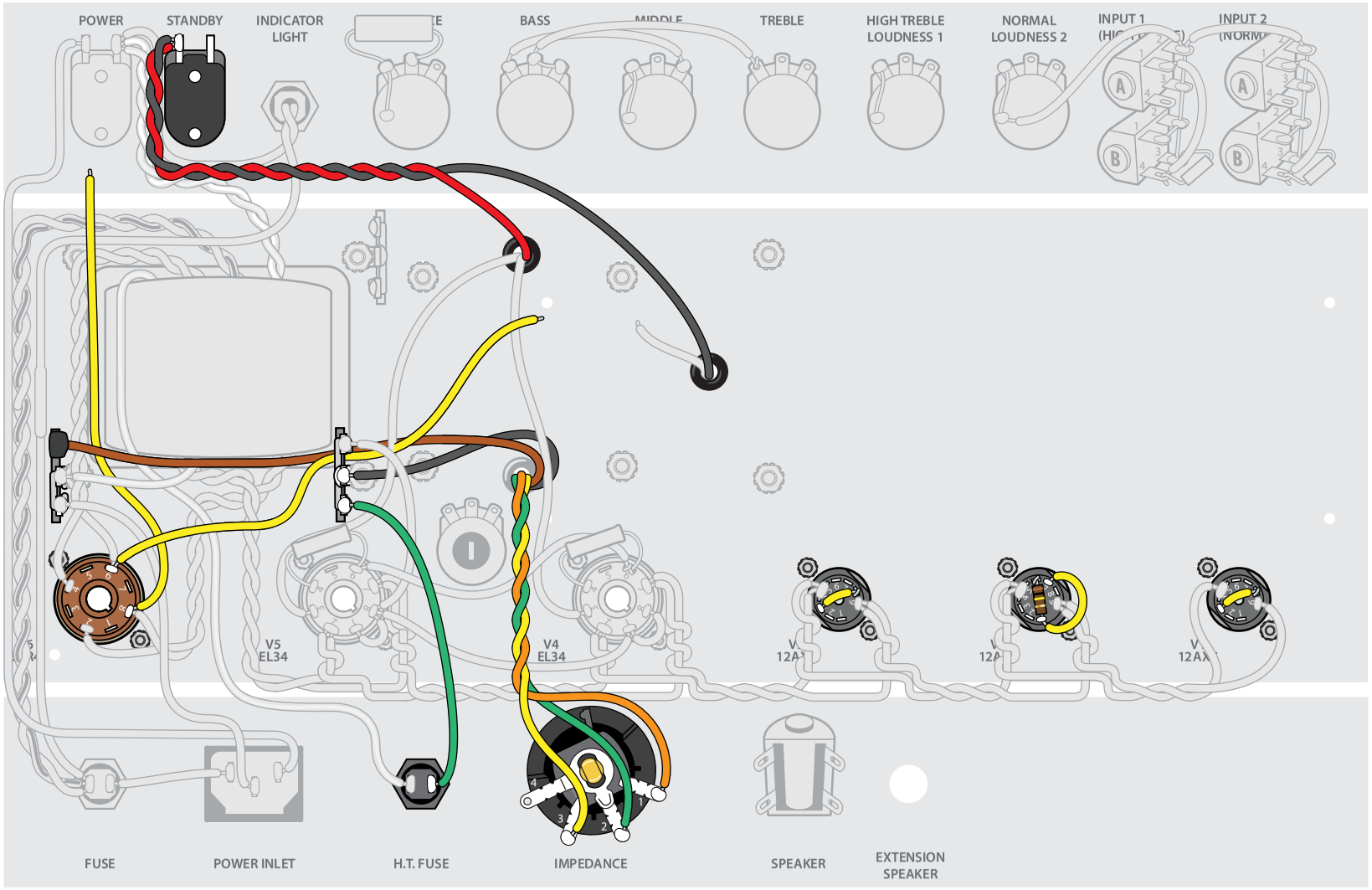
Connect the output transformer's blue lead

Route the blue output transformer lead as shown on the wiring diagram, along the floor of the chassis, to pin 3 of the V5 socket. Route it like this because it is a signal carrying wire and needs to be kept away from the heater wires. Cut it to an appropriate length and solder it to V5 pin 3.

☐ STEP 44

Connect the output transformer's primary brown lead

Find the brown output transformer lead that is coming through the same grommeted hole as the output transformer blue and red leads. Run this brown output transformer lead as shown on the wiring diagram, along the floor of the chassis, to pin 3 of the V4 socket. Cut it to an appropriate length and solder it to V4 pin 3.

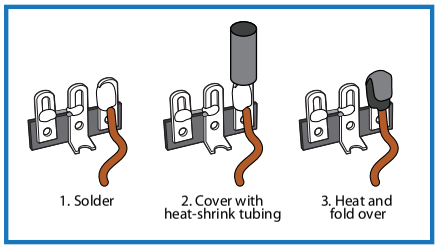


☐ STEP 45

Terminate the output transformer's secondary brown lead

Find the brown output transformer lead that is coming through the same grommeted hole as the output transformer's yellow, orange, green, and black leads. Run this brown lead to the two-lug grounding strip near the mains fuse socket. Route this lead as shown on the wiring diagram.

Solder this brown lead to the unconnected lug of this strip. This is an unused output transformer lead, which will carry unused voltage. It needs to be safely terminated and insulated. Once your solder joint cools, cover it with 1/2" length of 1/8" heat shrink tubing. As the heat shrink tubing is cooling, pinch the top of it with pliers to secure the solder joint, safely terminating this lead.



☐ STEP 46

Output transformer red lead + filter choke lead

Twist the output transformer's red lead with either one of the black filter choke leads. Run these leads to the left lug of the standby switch and cut them to an appropriate length. Solder them to the left lug of the standby switch.

☐ STEP 47

Ground the output transformer's black lead

Run the black wire from the output transformer to the 3-lug grounding strip near V5. Trim it to length and solder it to the right lug of the strip.

☐ STEP 48

Add one green jumper

Cut one 2" green jumper. Solder one end of this jumper to the right lug of the H.T. fuse socket. Solder the other end of this jumper to the left lug of the grounding strip next to V5.

☐ STEP 49

Add two yellow jumpers

Cut two 1" yellow jumpers.

Use one to connect pin 3 and pin 8 of socket V1. Solder it to pin 3 only.

Use the other to connect pin 3 and pin 8 of socket V3. Solder it to pin 3 only.

☐ STEP 50

Add two more yellow jumpers

Cut two 7" yellow jumpers.

Solder one jumper to V6 pin 6 and route it under the grounding strip near V5 and toward the grommeted hole with the red, blue, and brown output transformer leads. Leave it there for now, you'll be connecting it to the turret board later.

Solder the other jumper to pin 8 of V6 and route it between the side wall of the chassis and the power transformer toward the power switch. Leave this one here for now, too. You'll be connecting it to a filter cap shortly.

☐ STEP 51

Add a yellow jumper + one resistor

Cut one 2" yellow jumper. Solder one end to V2 pin 7. Route the jumper around the outside of the socket and wrap the other end to pin 1 of the same socket.

Add a 100k resistor between pin 1 and pin 6 of socket V2. Solder the resistor lead to pin 1 along with the jumper already in place. Leave the other end unsoldered. Trim any excess lead.

☐ STEP 52

Install the impedance switch

Mount the impedance selector switch as shown in the diagram, with the two middle lugs facing up.

There is no hole in the chassis for the tang washer included with this switch, so simply flip the washer so the tang is facing away from the chassis wall.

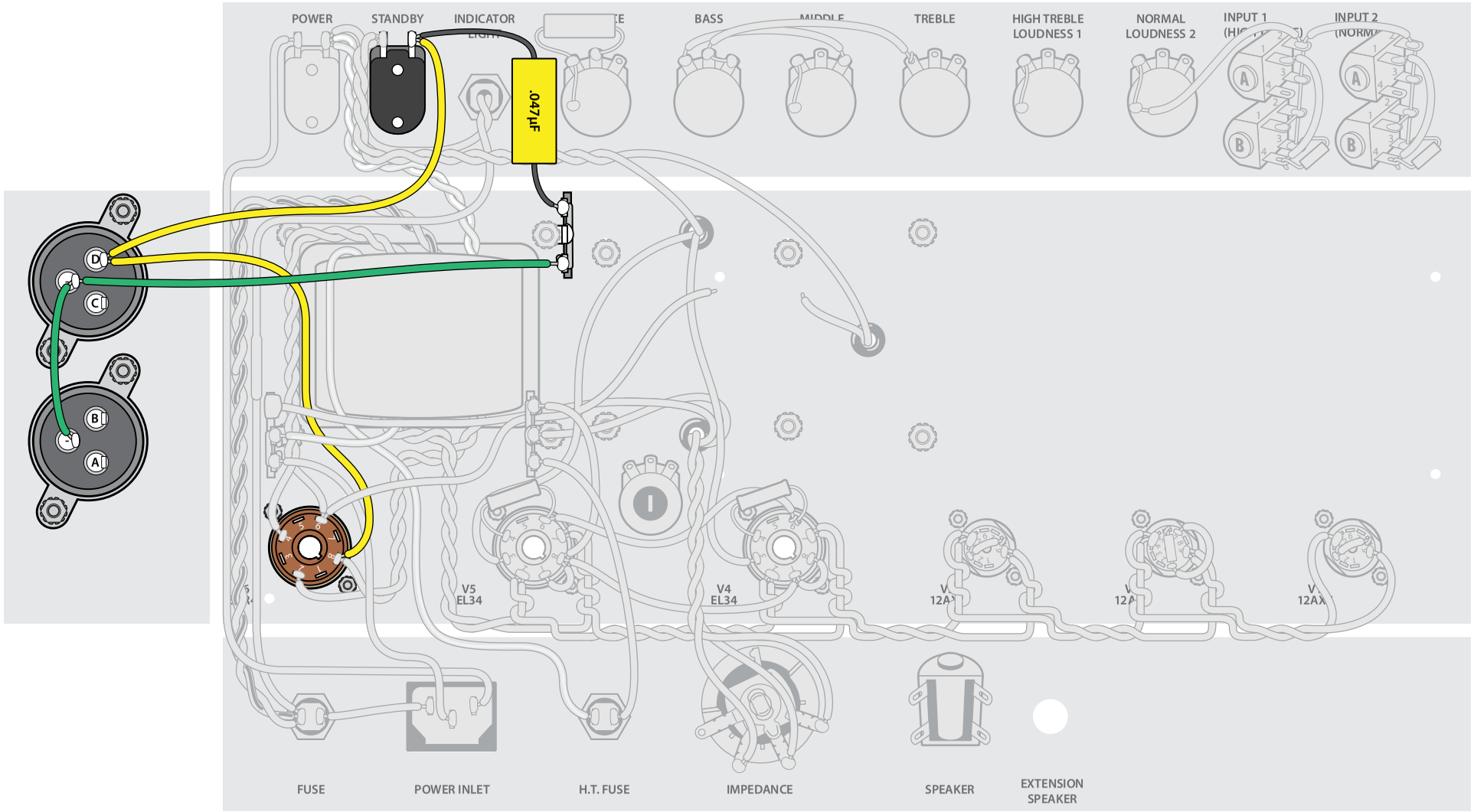
☐ STEP 53

Connect the impedance switch

The impedance selector switch allows you to set the amplifier's output to match the speaker cabinet you will use.

Cut the output transformer's twisted orange, green, and yellow wires to length for connecting to the impedance selector switch.

Solder the orange wire to the right lug (lug 1 in the diagram). Solder the green wire to lug 2, and the yellow wire to lug 3. The left lug (4) is empty at this point.



☐ STEP 54

Mount the filter caps

The filter capacitors are held to the chassis with mounting clamps. These clamps attach to the capacitor on the end opposite the lugs, and are then mounted to the chassis using 6-32 x 1/2" screws and nuts. Position the clamp so you can mount the capacitor's negative (–) lug facing up.

The tabs on the filter cap mounting clamps will stick out above the edge of the chassis. Use needle nose pliers to bend them down so they are not sticking up above the edge of the chassis.

These two filter caps will be referred to as the front filter cap and the back filter cap, and their positive lugs are assigned the letters A-D for clarity.

☐ STEP 55

Ground the filter caps

Cut a 2-1/2" green jumper. Solder one end of this jumper to the back filter cap's negative (-) lug. Wrap the other end of this jumper to the front filter cap's negative lug but don't solder it yet.

Cut a 4" green jumper. Solder one end of this jumper to front filter cap's negative lug. Solder the other end of the jumper to one of the lugs of the grounding strip under the presence pot.

☐ STEP 56

Connect one jumper

Find the 7" yellow jumper attached to pin 8 of socket V6. Wrap the free end of that jumper to lug D on the front filter cap but don't solder it yet.

☐ STEP 57

Add one jumper

Cut one 1-3/4" yellow jumper and solder one end to lug D of the front filter cap along with the jumper already wrapped to that lug. Wrap the other end of this jumper to right lug of the standby switch but don't solder it yet.

☐ STEP 58

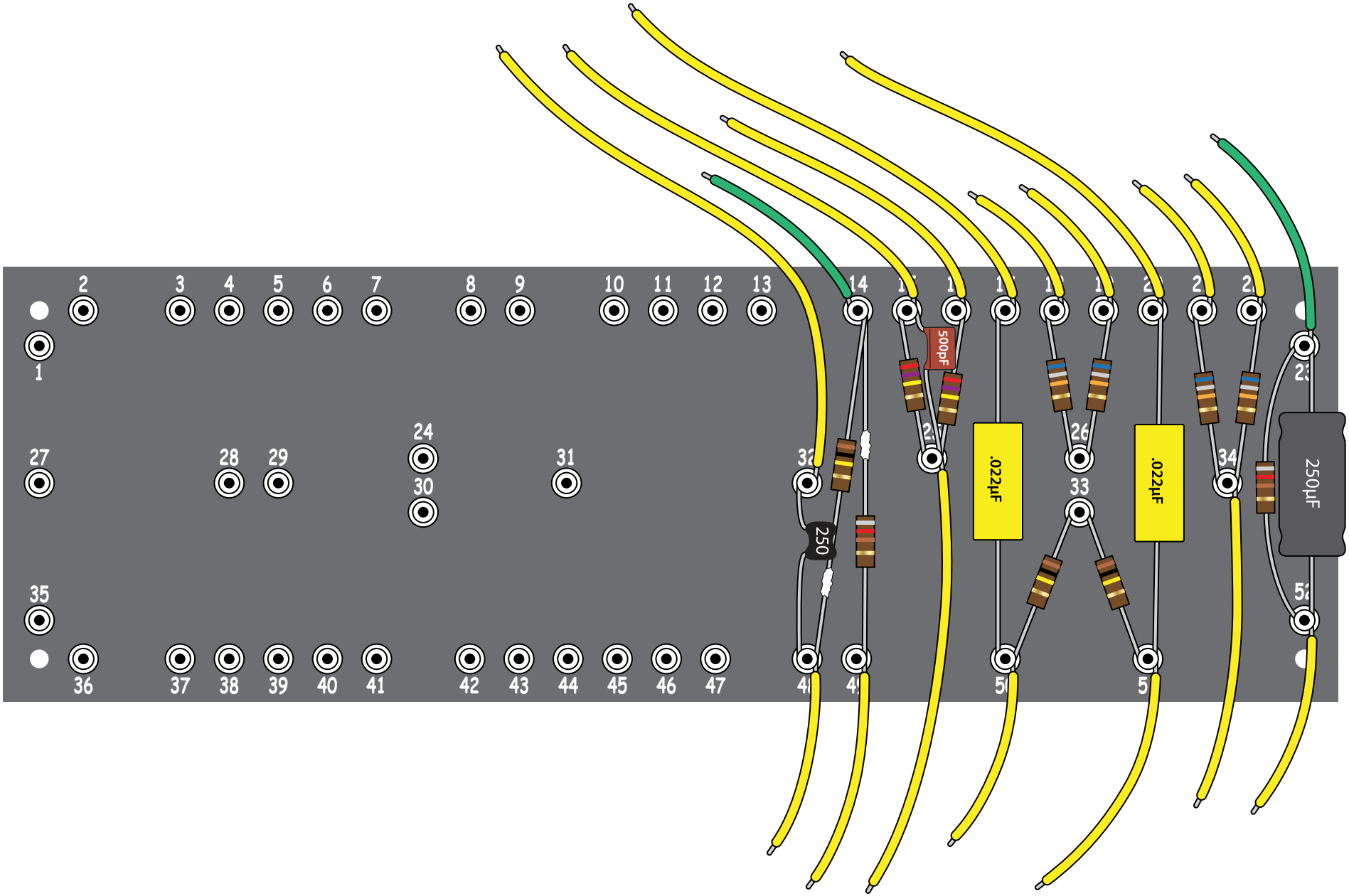
Add one cap

Add 1" of 1/16" heat-shrink tubing to each lead of a .047µF capacitor. Apply heat to shrink the tubing to the lead. Solder one lead to the right lug of the standby switch along with the jumper already in place. Solder the other lead of this capacitor to the grounding strip under the presence pot.

Stop and inspect your work

This is a good time to step away from the project for a few minutes. Take a break before reviewing your work for errors.

When you're ready to go at it again, very carefully walk through every connection you've made so far. When everything checks out, you're ready to move on to the turret board.



Wrapping parts onto the turret board

You're ready to start putting parts on the turret board. In these steps, you'll wrap the leads onto the turrets without soldering, and the solder will be added later. This allows you to check your work and make corrections without having to undo solder joints. Ideally, you solder each joint only once.

☐ STEP 59

Wrap an 820Ω resistor

Wrap an 820Ω resistor between turrets 23 and 52.

☐ STEP 60

Add a 250µF bipolar electrolytic capacitor + two jumpers

Normally electrolytic capacitors are polarized. However, this one is bipolar meaning it can be installed in either direction. Wrap one lead to turret 23 and the other lead to turret 52.

Add a 2-1/2" yellow jumper to turret 52.

Add a 3" green jumper to turret 23.

☐ STEP 61

Add two resistors

Add one 68k resistor between turrets 22 and 34.

Add another 68k resistor between turrets 21 and 34.

☐ STEP 62

Add three jumpers

Cut two 2" yellow jumpers.

Add the first jumper to turret 22.

Add the second jumper to turret 21.

Add a 4-1/2" yellow jumper to turret 34. Run this jumper straight down to the bottom of the turret board and bend it over the edge of the board to keep it in place.

☐ STEP 63

Add four resistors

Add one 68k resistor between turrets 19 and 26.

Add another 68k resistor between turrets 18 and 26.

Add one 100k resistor between turrets 33 and 50.

Add another 100k resistor between turrets 33 and 51.

☐ STEP 64

Add two capacitors

Add a .022µF capacitor between turrets 20 and 51. This and the following yellow capacitors are not polarized, so you can install them in either direction. We recommend facing them all in the same direction, making their printed specs easy to read.

Add another .022µF capacitor between turrets 17 and 50.

☐ STEP 65

Add four jumpers

Cut two 2" yellow jumpers.

Add the first jumper to turret 19.

Add the second jumper to turret 18.

Add a 5-1/2" yellow jumper to turret 20.

Add a 6-1/2" yellow jumper to turret 17.

☐ STEP 66

Add two more jumpers

Add a 3-1/2" yellow jumper to turret 51.

Add a 2-1/2" yellow jumper to turret 50.

☐ STEP 67

Add two resistors + one capacitor

Add a 270k resistor between turrets 16 and 25.

Add a 270k resistor between turrets 15 and 25.

Add a 500pF cap between turrets 15 and 25.

☐ STEP 68

Add three jumpers

Add a 4-1/2" yellow jumper to turret 16.

Add a 6" yellow jumper to turret 15.

Add a 6" yellow jumper to turret 25.

☐ STEP 69

Add two resistors with extensions

Cut one 1" yellow jumper and remove the insulation. Wrap and solder this jumper around one lead of an 820Ω resistor to extend the lead of the resistor. Doing this will allow the resistor to reach between turrets 14 and 49.

Add this 820Ω resistor with the extension between turrets 14 and 49.

Cut another 1" yellow jumper and remove the insulation. Wrap and solder this jumper around one lead of a 100K resistor to extend the lead of the resistor. Add this resistor between turrets 14 and 48.

☐ STEP 70

Add one capacitor + three jumpers

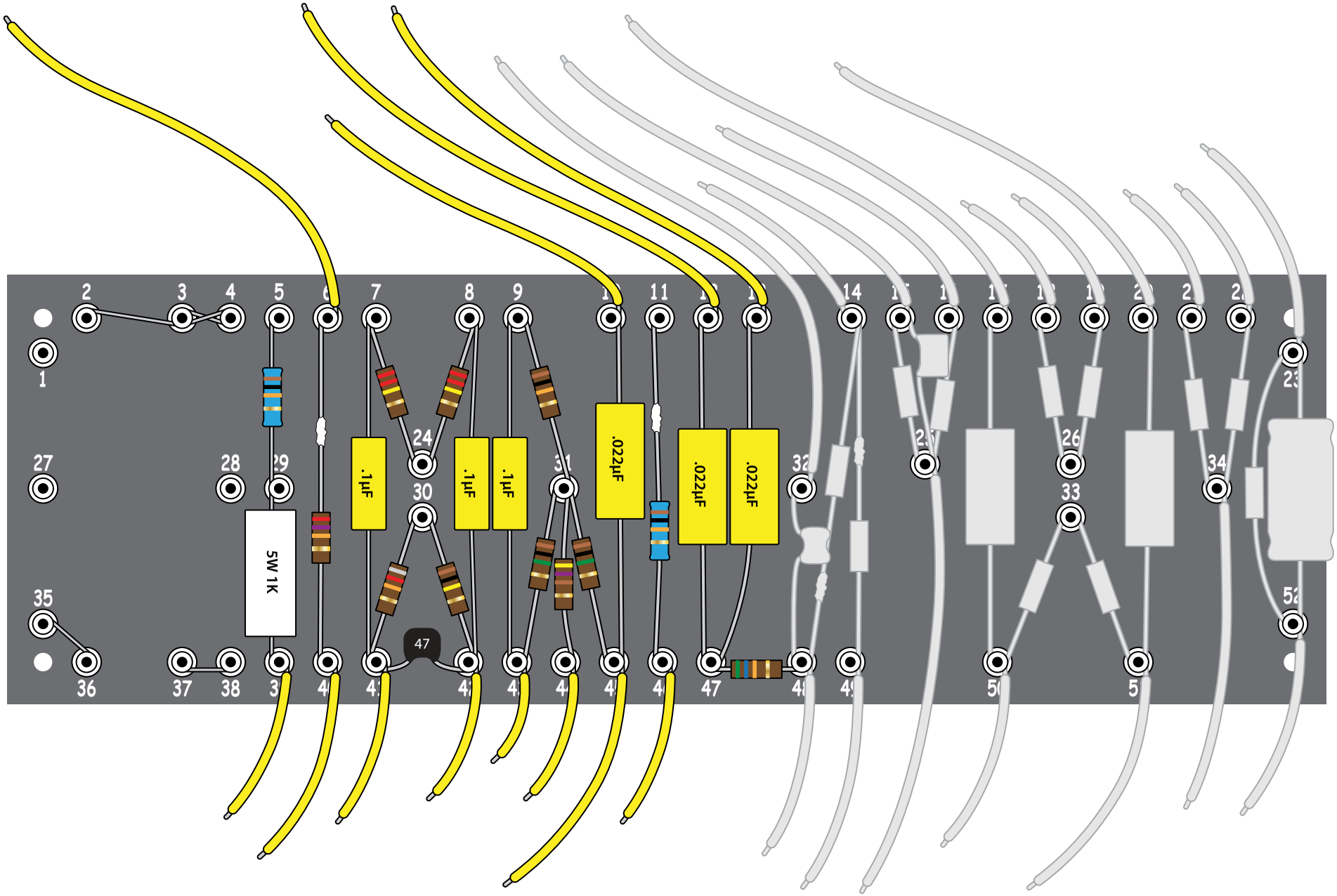
Add a 250pF Silver Mica capacitor between turrets 32 and 48.

Add a 3" yellow jumper to turret 49.

Add a 2-1/2" yellow jumper to turret 48.

Add an 8" jumper to turret 32. Run this turret up toward the top of the board and bend it over the edge of the board to keep it in place.

Add a 3" green jumper to turret 14.



☐ STEP 71

Add one resistor + two capacitors

Add a 56k resistor between turrets 47 and 48.

Add a .022uF capacitor between turrets 13 and 47.

Add another .022uF capacitor between turrets 12 and 47.

☐ STEP 72

Add two jumpers

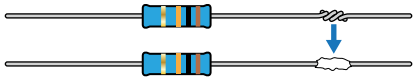
Add a 7-1/2" yellow jumper to turret 13.

Add an 8" yellow jumper to turret 12.

☐ STEP 73

Add one resistor + one jumper

Cut one 1" yellow jumper and remove the insulation. Wrap and solder this jumper around one lead of a 10K 2W resistor to extend the lead of the resistor.



Add this 10K 2W resistor with the extension between turrets 11 and 46.

Add a 2-3/4" yellow jumper to turret 46.

☐ STEP 74

Add four resistors

Add a 470Ω resistor between turrets 31 and 44.

Add a 1M resistor between turrets 31 and 45.

Add another 1M resistor between turrets 31 and 43.

Add a 10K resistor between turrets 9 and 31.

☐ STEP 75

Install two capacitors + four jumpers

Add a .022µF cap between turrets 10 and 45.

Add a .1µF cap between turrets 9 and 43.

Add a 5" yellow jumper to turret 10.

Add a 4" yellow jumper to turret 45.

Add a 2" yellow jumper to turret 44.

Add a 1-1/2" yellow jumper to turret 43.

☐ STEP 76

Add four resistors

Add a 100K resistor between turrets 30 and 42.

Add an 82K resistor between turrets 30 and 41.

Add a 220K resistor between turrets 8 and 24.

Add another 220K resistor between turrets 7 and 24.

☐ STEP 77

Add three capacitors and two jumpers

Add a 47pF cap between turrets 41 and 42.

Add a .1µF cap between turrets 8 and 42.

Add another .1µF cap between turrets 7 and 41.

Add a 2" yellow jumper to turret 42.

Add a 3-3/4" yellow jumper to turret 41.

☐ STEP 78

Add one resistor + two jumpers

Cut two 1" yellow jumper and remove the insulation. Wrap and solder one jumper around one lead of a 27K resistor to extend the lead of the resistor.

Add this 27K resistor with extension between turrets 6 and 40.

Add a 7" yellow jumper to turret 6.

Add a 4" yellow jumper to turret 40.

☐ STEP 79

Add two resistors + one jumper

Add a 10K 2W resistor between turrets 5 and 29.

Add a 1K 5W resistor between turrets 29 and 39.

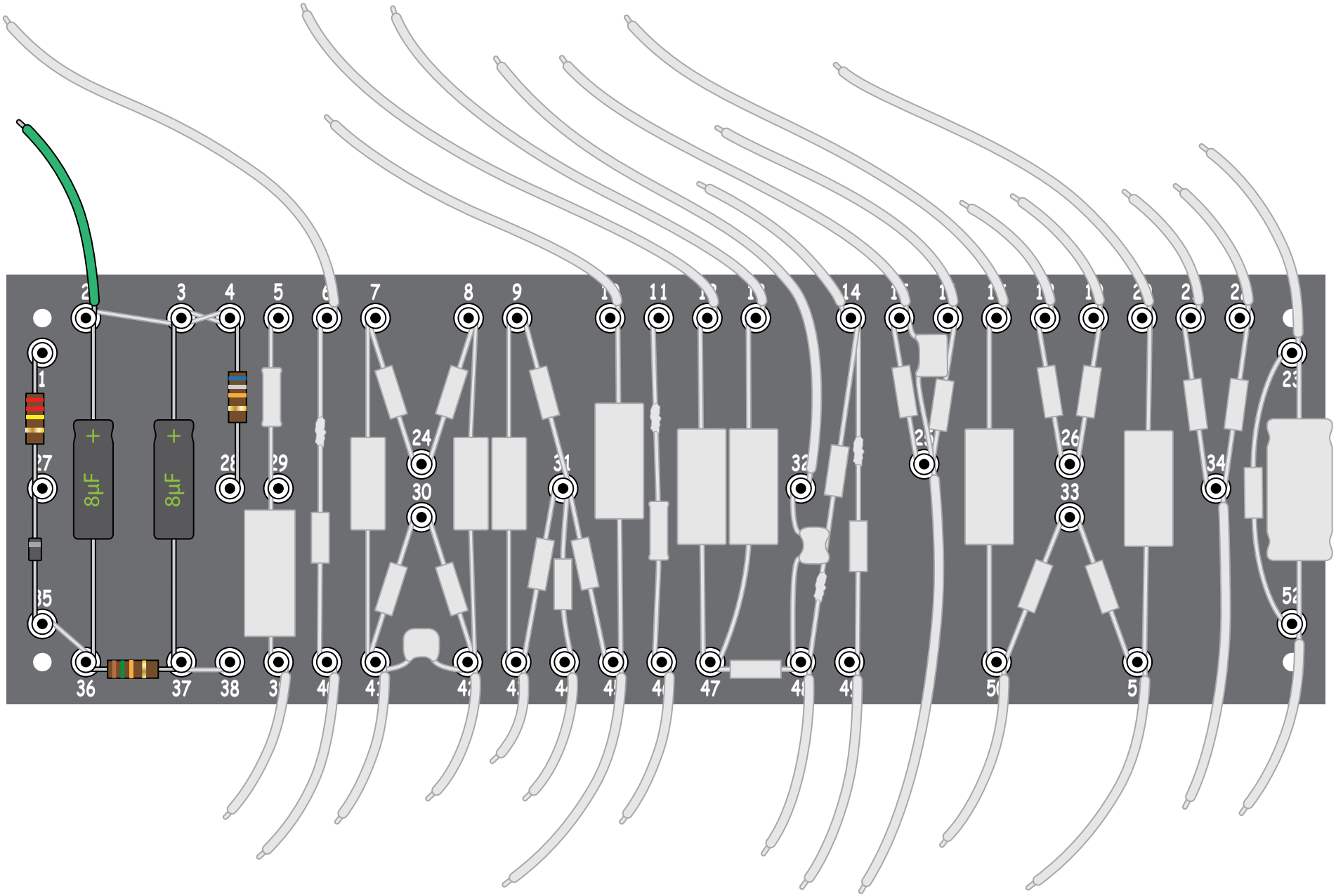
Add a 2-1/2" yellow jumper to turret 39.

☐ STEP 80

Add three jumpers

Cut a 3-1/2" green jumper and remove the insulation. Starting at turret 2, wrap in a figure 8 pattern around turret 3, completely around turret 4, and then in an opposite figure 8 pattern around turret 3, and back to turret 2. This creates a bus connecting turrets 2, 3, and 4.

Cut two 1" green jumper and remove their insulation. Wrap one around turrets 37 and 38 and wrap the other around turrets 35 and 36.



☐ STEP 81

Add one resistor + two capacitors

Add a 68K resistor between turrets 4 and 28.

Add an 8µF electrolytic capacitor between turrets 3 and 37. This cap is polarized, so be sure the negative lead goes to turret 37 and the positive lead to turret 3.

Add another 8µF electrolytic capacitor between turrets 2 and 36. This cap is also polarized, so be sure the negative lead goes to turret 36 and the positive lead to turret 2.

☐ STEP 82

Add one jumper

Add a 3" green jumper to turret 2. Route this jumper to the left of the turret board.

☐ STEP 83

Add two resistors and a diode

Add a 220K resistor between turrets 1 and 27.

Add a 15K resistor between turrets 36 and 37.

Add the 1N4007 diode between turrets 27 and 35.

Note the polarity of the diode. The positive lead of the diode is indicated by a stripe at that end. The end with no stripe is negative. Connect the negative lead to turret 35. Connect the positive lead to turret 27.

Stop and inspect your work

All the components and wires are now on the turret board. Take a break to rest your eyes before making sure you've followed each step correctly.

To find no mistakes at this stage would be surprising, and it's much less work to find them now than after soldering! As you check your work, make sure all the connections are tight.

☐ STEP 84

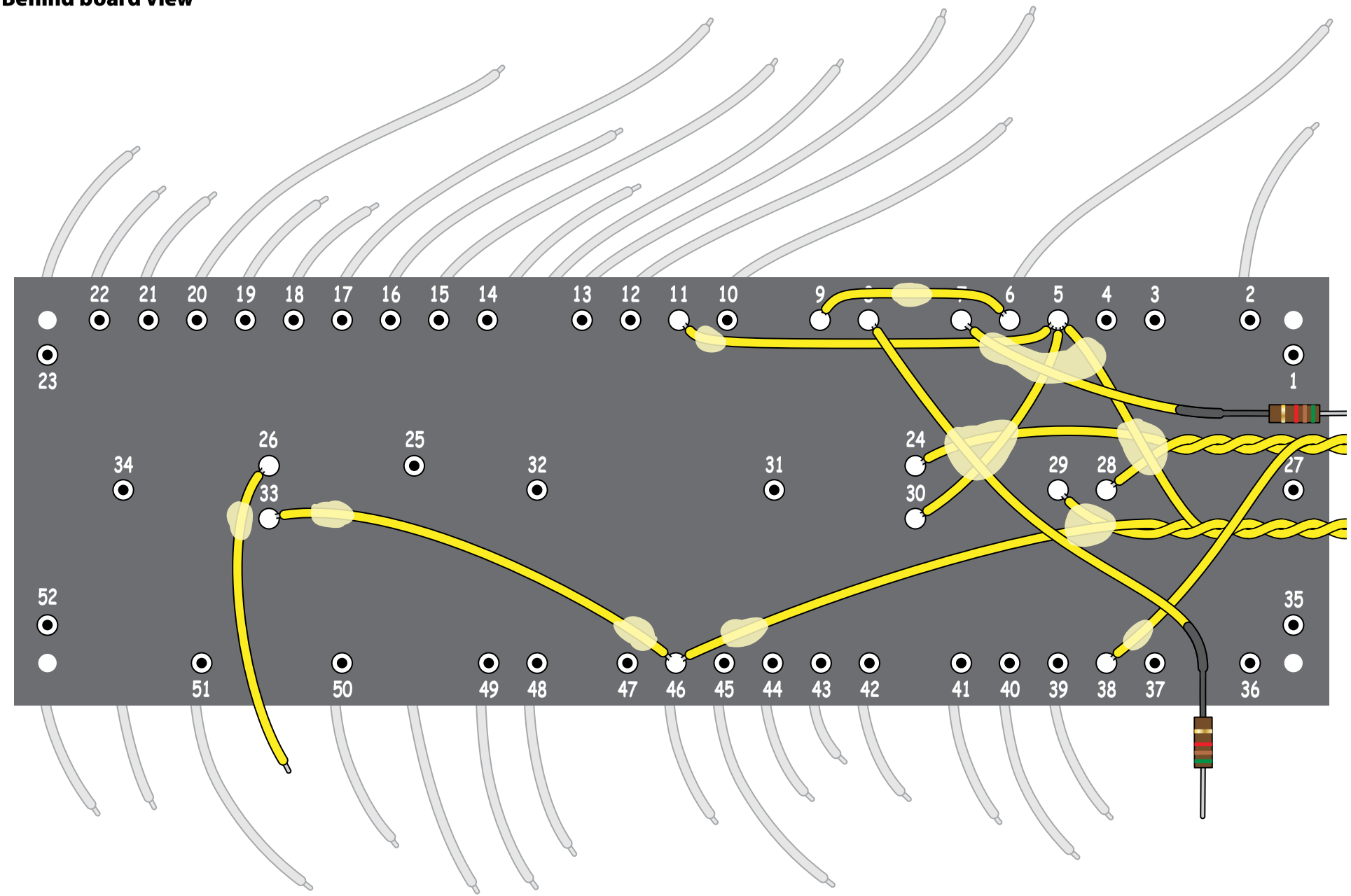
Solder the components on the turret board

It's time to set all the connections with solder.

Review the tips for great soldering on page 9, then solder each connection on the turret board.

After all the joints are soldered clip the excess leads from the turrets. Trimming the excess leads is important to avoid a short in your circuit. Check all your solder joints to make sure they're shiny, and to see that you didn't miss one.

Behind board view



☐ STEP 85

Add ten behind-the-board jumpers

The wiring diagram above is now a view of the turret board flipped over. Orient your board as shown in the diagram to simplify installation of the behind the board jumpers.

Cut these jumpers to length and trim 3/8" of shielding off each end. Run the exposed ends up into the bottom of the turrets and solder them into place.

Cut a 4" yellow jumper and solder one end to the bottom of turret 26. Route the free end straight down toward the bottom of the board, between turrets 50 and 51.

Cut another 4" yellow jumper and solder one end to the bottom of turret 33. Place the other end in the bottom of turret 46 but don't solder it yet.

Cut a 12" yellow jumper and solder one end to the bottom of turret 46 with the jumper already in place. Route the free end of this jumper toward turret 27.

Cut a 3" yellow jumper and solder it to the back of turret 30. Place the other end into the bottom of turret 5 but don't solder it yet.

Cut an 8-1/2" yellow jumper and add one end to the bottom of turret 5 but don't solder this yet either. Route the free end of this jumper toward turret 27.

Cut a 4" yellow jumper and solder one end to the bottom of turret 5 with the other two jumpers already in place. Solder the other end of this 4" jumper to the bottom of turret 11.

Solder one end of a 2-1/4" yellow jumper to the bottom of turret 6 and solder the other end to the bottom of turret 9.

Cut an 8" yellow jumper and solder one end to the bottom of turret 29. Route the free end toward turret 27.

Cut a 4-1/2" yellow jumper and solder one end to the bottom of turret 28. Route the free end toward turret 27.

Cut a 5-3/4" yellow jumper and solder one end to the bottom of turret 24. Route the free end toward turret 27.

Cut a 4" yellow jumper and solder one end to the bottom of turret 38. Route the free end toward turret 27.

☐ STEP 86

Add two more behind-the-board jumpers

Cut a 5" yellow jumper and a 6" yellow jumper. Strip 1" of insulation from one end of each.

Add a 5.1K resistor to the stripped end of each of these jumpers. Once the solder joints cool, add 1" of 1/8" heat-shrink tubing to insulate the solder joint.

Once the heat shrink cools, solder the resistor free end of the 5" jumper to the bottom of turret 8. Route the end of this jumper with the resistor attached toward turret 37.

Solder the resistor free end of the 6" jumper to the bottom of turret 7. Route the end of this jumper with the resistor attached toward turret 27.

☐ STEP 87

Check the continuity of your back-of-board jumpers

Once all of these solder joints are set, flip the board back over and test for continuity on each pair of turrets connected by back-of-board runs. Use a multimeter for continuity testing, as described on page 43.

You should have continuity on the following pairs of turrets:

- ❑ turret 33 to turret 46
- ❑ turret 5 to turret 11
- ❑ turret 30 to turret 5
- ❑ turret 6 to turret 9

☐ STEP 88

Organize the behind-the-board jumpers

Twisting some of these jumpers together will help organize them for easier assembly later, and it will help keep them tidy in the long run. Remember, good lead dress means less noise. (see page 37)

Three of these jumpers will be going to the filter capacitors mounted against the side wall. These jumpers will be carrying high voltage to the turret board, so we want to twist them together to keep them neat and away from signal carrying wires. Twist the jumpers coming from turrets 5, 29, and 46 together. Keep them routed past turret 27 once they are twisted.

Twisting the jumpers to the bias pot is also a good idea. These jumpers come from turrets 24, 28, and 38. Twist them together and route the twisted leads past turret 27.

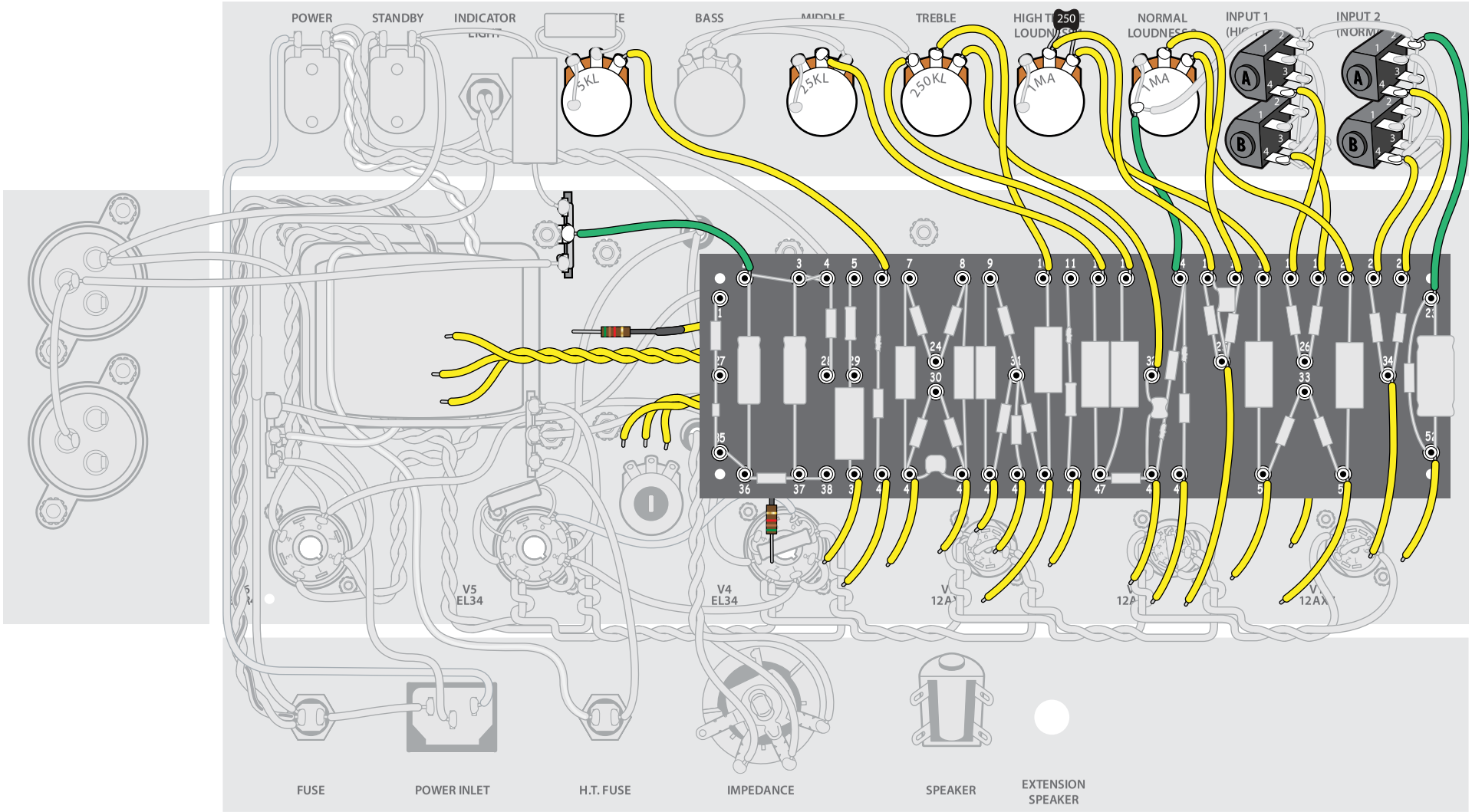
Make sure the jumper from the back of turret 8 is routed past turret 37, and make sure the jumper from turret 7 is routed past turret 27.

☐ STEP 89

Glue behind-the-board jumpers down

As your amp ages, it will need parts replaced. When you heat a turret to remove a worn-out part, a behind-the-board jumper could come dislodged from the back of the turret, introducing a whole new problem. To prevent this, apply a dime sized amount of contact cement to each wire's insulation as shown. This will hold the jumpers tight to the back of the board even when you heat the turret and solder liquefies.

Allow this glue to cure overnight. This is a good chance to stop and double check all of your connections one more time before installing the turret board in to the chassis.



Installing the turret board in the chassis

You're ready to install the turret board in the chassis.

It's time to remove your tape with the turret numbers. When the board's installed, you won't be able to get at the tape to remove it. From this point on, you can identify jumpers and turrets by referring to the diagrams.

☐ STEP 90

Add the last filter choke lead

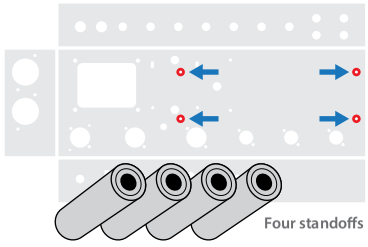
Before mounting the turret board in the chassis, solder the last filter choke lead to the bottom of turret 29 along with the jumper already in place.

☐ STEP 91

Install the turret board

To keep the turret board connections from shorting against the metal chassis, the board is mounted on four threaded standoffs that hold it away from the chassis

Use 4-40 screws to mount these four standoffs to the chassis. Line up the turret board on these standoffs.



☐ STEP 92

Solder the normal channel jacks

Solder the jumper from turret 21 to lug 4 of normal channel jack B.

Solder the jumper from turret 22 to lug 4 of normal channel jack A.

Solder the jumper from turret 23 to lug 2 of normal channel jack A.

☐ STEP 93

Solder the high treble channel jacks

Solder the jumper from turret 19 to lug 4 of high treble channel jack B.

Solder the jumper from turret 18 to lug 4 of high treble channel jack A.

Tips for lead dress with jumpers

As general rule for installing these jumpers, when two jumpers cross over each other, bend them so they cross at 90° angles rather running side-by-side. This lead dress detail influences the amp's sound, especially on a high-gain circuit like this one.

☐ STEP 94

Solder the normal channel loudness pot

Solder the jumper from turret 20 to the right lug of the normal channel loudness pot.

Solder the jumper from turret 16 to the middle lug of the normal channel loudness pot.

Solder the jumper from turret 14 to the back of the normal channel loudness pot.

☐ STEP 95

Solder the high treble channel loudness pot

Add a 250pF capacitor between the right and middle lugs of the high treble channel loudness pot but don't solder the leads yet.

Solder the jumper from turret 17 to the right lug of the high treble channel loudness pot along with the capacitor lead already in place.

Solder the jumper from turret 15 to the middle lug of the high treble channel loudness pot along with the capacitor lead already in place.

☐ STEP 96

Solder the treble pot

Solder the jumper from turret 32 to the right lug of the treble pot.

Solder the jumper from turret 10 to the middle lug of the treble pot.

Solder the jumpers from turret 13 to the left lug of the treble pot.

☐ STEP 97

Solder the mids pot

Solder the jumper from turret 12 to the middle lug of the mids pot.

☐ STEP 98

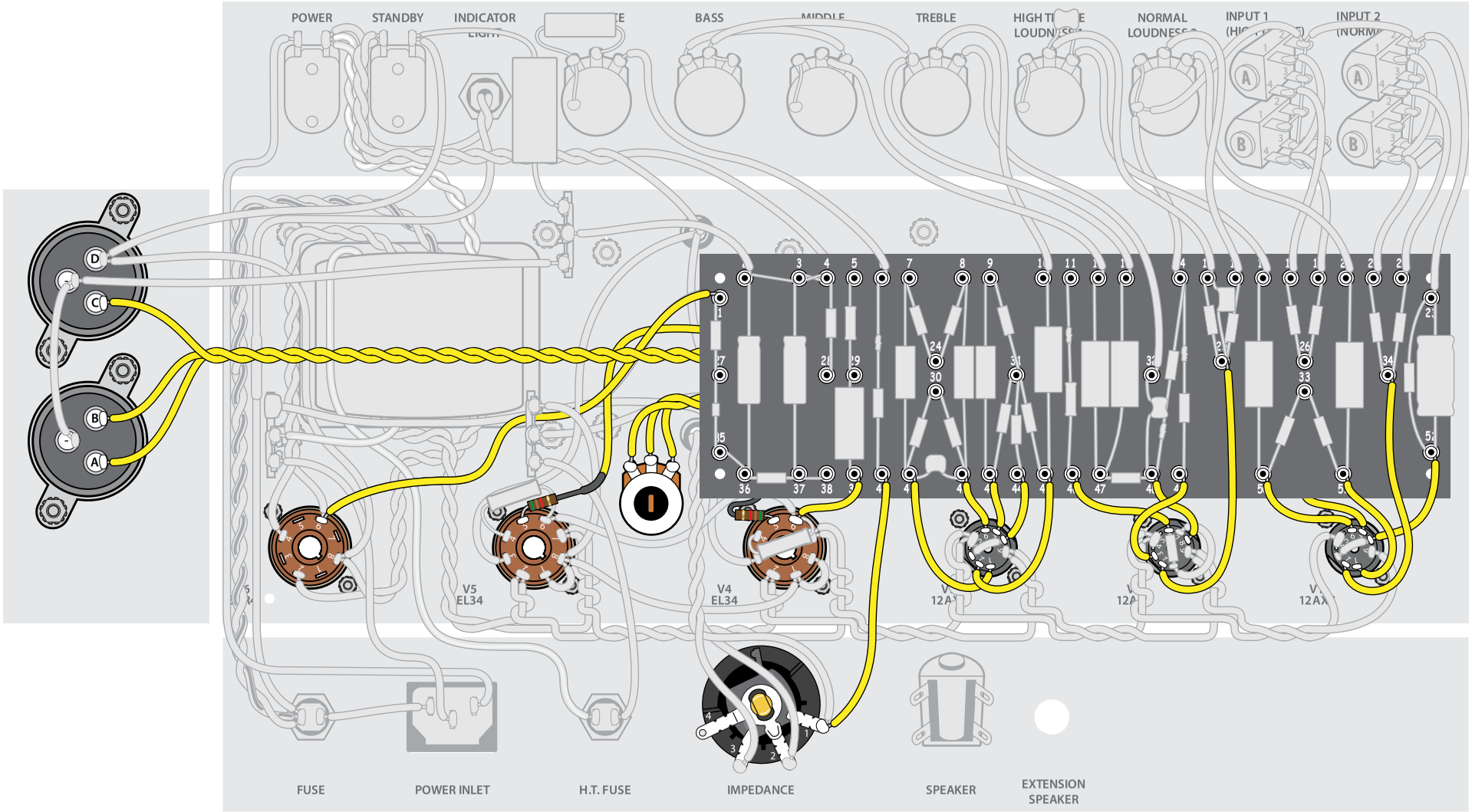
Solder the presence pot

Solder the jumper from turret 6 to the right lug of the presence pot.

☐ STEP 99

Solder the ground jumper

Solder the green jumper from turret 2 to the 3-lug grounding strip under the presence pot.



☐ STEP 100

Solder the jumpers to V1

Solder the jumper from turret 51 to V1 pin 1.

Solder the jumper from turret 50 to V1 pin 6.

Solder the behind-the-board jumper from turret 26 to V1 pin 7.

Solder the jumper from turret 34 to V1 pin 2.

Solder the jumper from turret 52 to V1 pin 8 along with the jumper already in place.

☐ STEP 101

Solder the jumpers to V2

Solder the jumper from turret 46 to V2 pin 6 along with the resistor lead already in place.

Solder the jumper from turret 48 to V2 pin 8.

Solder the jumper from turret 49 to V2 pin 3.

Solder the jumper from turret 25 to V2 pin 2.

☐ STEP 102

Solder the jumpers to V3

Solder the jumper from turret 41 to V3 pin 1.

Solder the jumper from turret 42 to V3 pin 6.

Solder the jumper from turret 43 to V3 pin 7.

Solder the jumper from turret 45 to V3 pin 2.

Solder the jumper from turret 44 to V3 pin 8 along with the jumper already in place.

☐ STEP 103

Solder the jumpers to V4

Solder the jumper from turret 39 to V4 pin 6 along with the jumper and resistor lead already in place.

Solder the jumper from turret 8 (running underneath the board with a 5.1k resistor attached to the end) to V4 pin 5. You want to solder this resistor very close to the tube socket, as pictured in the diagram.

☐ STEP 104

Solder the jumpers to V5

Solder the jumper from turret 7 (running underneath the board with a 5.1k resistor attached to the end) to V5 pin 5. You want to solder this resistor very close to the tube socket, as pictured in the diagram.

☐ STEP 105

Solder the jumpers to V6

Solder the jumper from pin 6 of socket V6 to turret 1.

☐ STEP 106

Solder one jumper

Solder the jumper from turret 40 to lug 1 of the impedance selector switch along with the orange output transformer lead.

☐ STEP 107

Solder the jumpers to the bias pot

The shorter set of three twisted jumpers coming from the left side of the turret board are going to the bias pot. These three jumpers will have continuity to turrets 24, 28, and 38.

Find the jumper with continuity to turret 28 and solder it to the left lug of the bias pot.

Find the jumper with continuity to turret 24 and solder it to the middle lug of the bias pot.

Find the jumper with continuity to turret 38 and solder it to the right lug of the bias pot.

☐ STEP 108

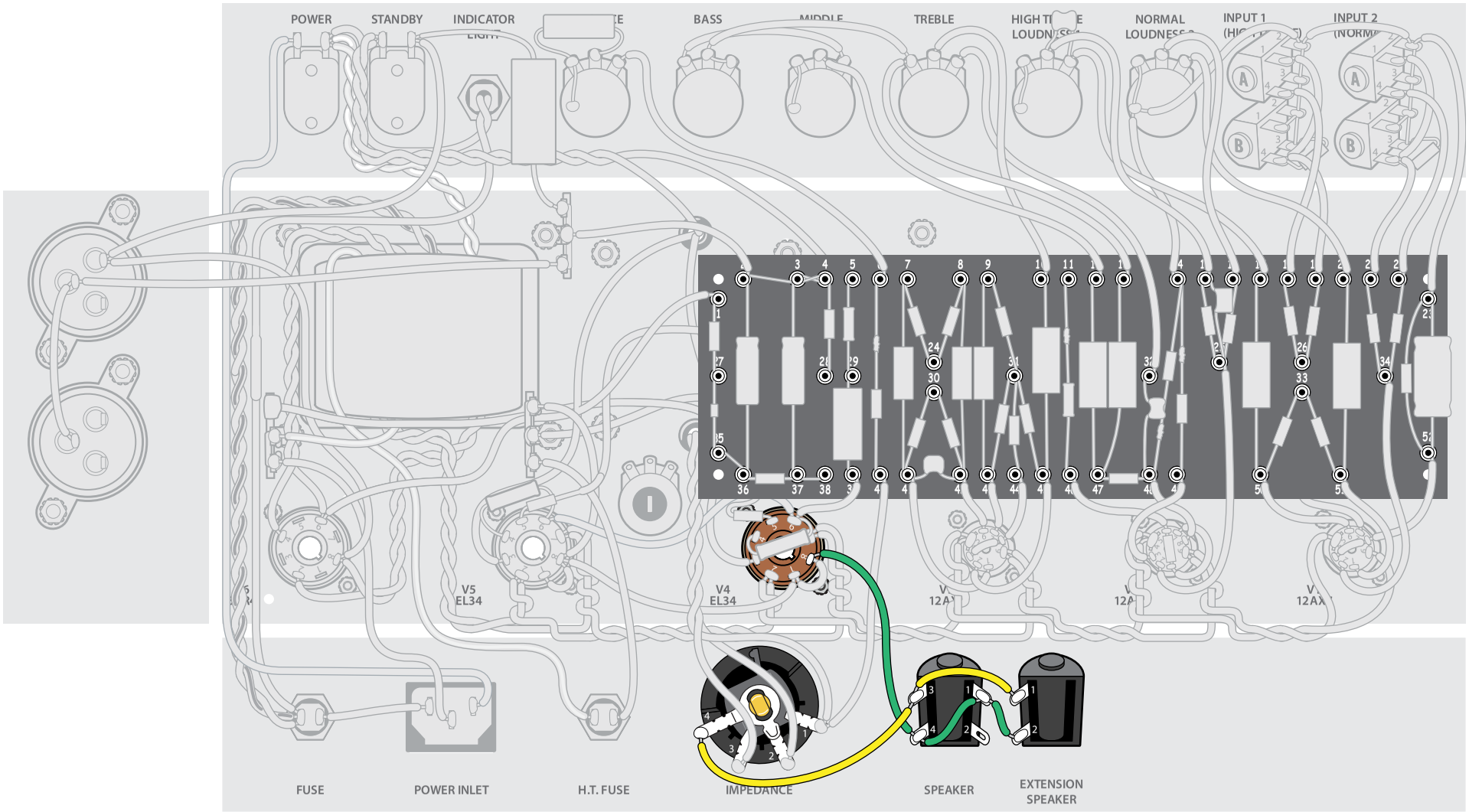
Solder the jumpers to the filter caps

The other set of three twisted jumpers coming from the left side of the turret board are going to the filter caps. These three jumpers will have continuity to turrets 5, 29, and 46.

Find the jumper with continuity to turret 5 and solder it to filter cap lug A.

Find the jumper with continuity to turret 46 and solder it to filter cap lug B.

Find the jumper with continuity to turret 29 and solder it to filter cap lug C.



☐ STEP 109

Install the speaker jacks

Install the last component in to the chassis, the extension speaker jack.

The two-lug jack is the extension speaker jack and goes to the right of the main speaker jack.

☐ STEP 110

Wire up the speaker jacks

Cut a 2" yellow jumper and wrap it through lug 1 of the two-lug extension speaker jack and the other end of the jumper into lug 3 of the four-lug speaker jack. Solder this jumper to lug 1 of the two-lug jack.

Cut a 1-1/2" green jumper and solder it to lug 2 of the two-lug extension speaker jack and wrap the other end to pin 1 of the four-lug speaker jack.

Cut a 1" green jumper and solder one end to lug 1 of the four-lug speaker jack along with the jumper already in place. Wrap the other end to lug 4 of the four-lug speaker jack but don't solder it yet.

Cut a 3" green jumper and solder one end to lug 4 of the four-lug speaker jack along with the jumper already in place. Solder the other end of this jumper to pin 8 of socket V4.

Cut a 4-1/4" yellow jumper and solder one end into lug 3 of the four-lug speaker jack along with the jumper already in place. Solder the other end of this jumper to lug 4 on the impedance selector switch.

Take a break and review your work

Now you've soldered the components and wires, and it's time to take a break. Rest your eyes and review your work later, carefully searching out any errors before you move on.

Installing parts and preparing for testing

☐ STEP 111

Glue the tube placement chart

Cut out the chart on page 53. With a thin coat of glue or contact cement, glue it to the inside wall of the cabinet.

☐ STEP 112

Install the fuses

Install the 3-amp fuse in the mains fuse socket and the 500mA fuse in the H.T. fuse socket.

☐ STEP 113

Install the seven control knobs

Turn the shaft of each pot all the way counterclockwise to the "off" point and install the knob so the indicator line points to zero. Don't forget the knob for the impedance selector switch on the back.

☐ STEP 114

Set the chassis on chassis stand or on blocks for testing

Set your chassis up for final testing. Chassis stands are extremely useful for this. If you do not have a chassis stand a couple of blocks of wood can work just fine.

DON'T INSTALL THE TUBES YET!
DON'T PLUG THE AMP IN YET!

The next page is going to keep you out of trouble!

Any **multimeter** will work fine for the two types of tests we're about to do: checking **continuity** and reading **voltages**. The instructions that came with your meter will be helpful.

Continuity testing is simply making sure current flows between two points successfully. Touch the meter's red lead to one end of the section being tested, and the black lead to the other end. If the continuity is good, your meter will beep or register this on the display.

Voltage testing is where you need to be careful. Some steps require the amp to be plugged in and turned on. This becomes dangerous if you're not cautious. Respect the voltages and follow the directions, and these tests are safe and easy.

☐ STEP 115

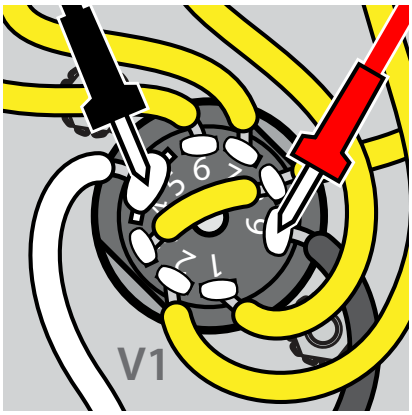
Perform a safe power-up

At this point, there should be no tubes installed, and the speaker should be disconnected.

Before plugging the amp in, turn the power switch to ON. Switching the amp on before the first power-up protects you from shock if a mistake in your wiring has created a short to the chassis. If this short exists, an indication would be that the pilot light will not turn on, since the AC current is going directly to ground.

Plug the power cord in. The pilot lamp should light.

For a few minutes, check for smoke or unusual smells. If anything seems unusual, disconnect the power immediately and carefully review all your connections.

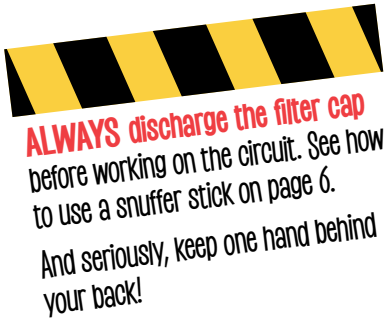


☐ STEP 116

Test the standard AC voltage

Set your multimeter to 20V AC. Check the heater voltage across pin 9 and pins 4+5 on the V1 12AX7 socket. This should read between 5-7V AC. If this reading is drastically different, disconnect power and check your connections.

If the amp seems normal, unplug the power cord while still leaving the power switch ON.



☐ STEP 117

Test the dangerous DC voltage

The dangerously high DC voltage that passes through the rectifier tube and the filter caps is referred to as "B+". The next step is to test this B+ voltage.

With the amp still unplugged, install the 5AR4 rectifier tube while spreading the tension clip with the other hand. Take care to position the indexing key correctly in the socket.

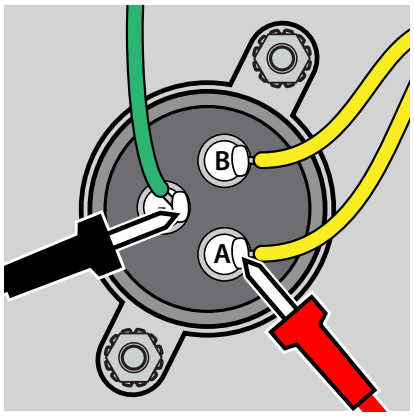
Plug the power cord back in. The pilot lamp should light, along with the filament inside the 5AR4 rectifier tube.

Again, spend a few moments checking for smoke or smells.

At this point, dangerous voltage is forming in the filter caps. Always discharge them before working on the circuit, even if the amp is unplugged. See how to use a snuffer stick on page 6.

For safety, use only one hand to probe the amp during DC tests.

Keep your other hand behind your back when you need to probe a component. This way, you can't be a path between B+ voltage and ground—a mistake that would send a dangerous charge through your heart.



Set your multimeter to 600V DC and connect the negative lead to ground. Once the negative lead is secured to ground, flip the standby switch to ON. Measure the DC voltage at lug A of the first filter cap. It should be roughly 500V DC.

Turn the power and standby switches to OFF and unplug the amp.

☐ STEP 118

Test the preamp tubes

Unplug the amp use the snuffer stick to discharge the capacitors, then install the three preamp tubes.

After these tubes are installed, plug the amp back in and flip the power switch ON. The pilot lamp should light up. Let the amp warm up for a few minutes and then flip the standby switch to ON. Again, if you get smoke or smells, unplug immediately.

Connect your multimeter's negative lead to ground.

Set the multimeter to 5V DC and check turret 52, which should read around 1.3V.

Set the multimeter to 200V DC and check turret 50. It should read around 200V.

Set the multimeter to 100V DC and test pin 5 of the V7 and V8 sockets. These readings should be nearly identical.

Use a small flathead screwdriver to turn the center of the bias pot all the way counter-clockwise. This will set the bias for the lowest negative DC voltage. Doing this provides a safe voltage for the power tubes while you set the initial bias.

If all of these voltages come within approximately 10% of their expected values, turn the power switch OFF.

Always turn the power switch off before turning the standby switch off. This will drain the filter capacitors as the amp cools down. After a moment, flip the standby switch OFF as well.

If the reading at turret 50 shows no voltage or low voltage, follow this test: unplug the amp, drain the filter caps with the snuffer stick, set your meter to read continuity, and make sure you have properly installed the back-of-board jumper from turret 46 to turret 33.

☐ STEP 119

Test the EL34 power tubes

With the amp unplugged, install the EL34 power tubes, turning them so their indexing keys fit correctly in the socket. Turn all of the front panel controls completely counter-clockwise, so the indicator line is pointing to "0".

Connect the amp to a speaker cabinet, adjust the impedance selector switch for the appropriate impedance, and perform these next tests with the speaker turned away from you. If the amp starts to oscillate and squeal, this will help protect your ears.

Plug the amp in and flip the power switch ON. Give the tubes 30 seconds to warm up and then flip the standby switch to ON as well.

After a few moments you should hear a low hum. If the hum becomes very loud, disconnect the power immediately and review your connections.

Set your multimeter to read 500V DC and test for voltage from pin 3 of both socket V5 and socket V4. This voltage should read around 450V. Write this number in Box 2 of the calculation in Step 121. It'll be needed if you use a bias meter to set your bias.

Set your multimeter to read 50V DC and test for voltage at turret 24. Adjust the bias pot until this voltage reads around -42V.

If all of these voltages come within approximately 10% of their expected values, turn the power switch OFF. After a few moments turn the standby switch OFF as well, and unplug the amp.

Tube bias affects your sound

"Bias" refers to the current of electrons flowing from the cathode to the plate inside your power tubes when the tubes are idle. The bias setting determines this flow and is increased or decreased by the screwdriver-adjustable bias pot.

Adjusting the bias affects your sound: a higher setting gives you punchier cleans and grittier distortion, but your tubes will wear out faster. With a low setting, your tubes last longer but the sound is more sterile. A good bias setting falls between these extremes.

☐ STEP 120

Old method of setting the bias: doing it by ear

If you have a bias meter, skip this step and go on to Step 121.

The old-school way of adjusting the bias is by ear: after setting the bias voltage to a recommended starting point, you make tiny adjustments to the bias pot while listening for the sound you want. This inexact method can shorten the life of your power tubes.

You roughed-in the bias setting in the previous step by setting the bias voltage at -42V.

Danger: set your guitar aside before you adjust the bias pot.

Do not touch any amp circuitry while holding your guitar. Doing so would create an electrocution hazard!

Use a screwdriver to make a tiny adjustment to the bias pot. Turn clockwise to increase the current and counter-clockwise to decrease it. Then set the screwdriver aside and play to hear to the result.

Watch out for red-plating

You especially want to avoid too much current turning the gray plates to glowing red. If your tubes start red plating, shut the amp down and let it cool before setting the bias to a lower level.

☐ STEP 121

Improved method of setting the bias: using a bias meter

The more accurate way to set the bias is by using a bias meter, such as the VHT Bias Tester (StewMac #1580).

This method starts with a simple calculation to find your bias setting, then you adjust the bias pot until your bias meter displays that reading.

The calculation uses two numbers, the tube's maximum plate dissipation and its plate voltage.

Plate dissipation. Every power tube has a specified plate dissipation—the maximum wattage the tube can handle. For the EL34 power tubes in this amp, that maximum is 25 watts. Exceeding the 25-watt limit will damage the tube, and operating at the full 25 watts will shorten its life. Our goal is to operate the tube at 60% of the 25-watt limit, or 15 watts. We've entered this number for you in Box 1 of the calculation.

Plate voltage. You already have the plate voltage for these tubes: it's the the number you found in step 119 and wrote in Box 2 below.

Divide Box 1 by Box 2. The result is your recommended bias setting for use in the next step. Our example calculation gives a bias recommendation of.034 Amps. Since bias is typically measured in milliamps, this measurement is written as 34mA.

With the amp unplugged allow the power tubes to cool. Once the power tubes have cooled, remove them from their sockets.

Plug the tubes in to the bias probe sockets, which are like tube sockets. Plug the probe sockets with tubes into the power tube sockets.

Plug the amp back in and flip the power switch ON. Give the tubes 30-60 seconds to warm up, then flip the standby switch ON.

Watch the bias meter as the power tubes heat up. Both needles should rise at an equal rate and settle at the same time.

Adjust your bias pot until the bias meter displays the reading you calculated (33mA in our example). Let the amp idle for a few minutes to make sure that the bias doesn't drift.

When you see a constant readout of your bias setting, turn the power switch OFF.

After a few moments flip the standby switch OFF and unplug the amp from the wall.

Once the tubes are cool, remove them and the bias probes from the amp and plug the tubes back into the amp's tube sockets without the probes attached.

After removing the bias probes and taking it for a test drive, if the amp is stable and your tests match the voltages specified, feel free to let it rip!

After playing for a few minutes and testing all inputs, if everything seems to be operating normally, go ahead and turn the amp off.

If there are any strange oscillations, squeals, or the amp seems at all unstable, use a wooden chopstick to begin probing for loose connections:

- ❑ from the input jacks to the turret board
- ❑ from the tube sockets to the turret board
- ❑ from the tube sockets to the front panel controls.

It usually takes just a minor wiring adjustment, perhaps resoldering a loose joint, to correct this sort of distortion.

BOX 1		BOX 2		
60% of max. plate dissapation		Your plate voltage from Step 165		Your bias current setting
15	÷		=	
Example:				
15	÷	450	=	0.033 (33 mA)

Final assembly

☐ STEP 123

Install the chassis

Discharge the capacitors so you can safely handle the chassis. Remove all the cables from their jacks.

Slide the chassis in from the back until its front edge meets the front wall of the cabinet. Insert the mounting screws through the floor of the chassis. Tighten the locknuts.

Install the preamp tube shields and install the back panel.

It's finally time to let it rip!

Tube life

The life span of the power tubes is affected by how hard you drive the amp. If you are overdriving the amp for hours every day, expect the power tubes to have a shorter life span.

We encourage you to experiment with different tube brands and find the brand that is most favorable to your ears and your wallet.

For questions and support, StewMac is here to help!

For more than fifty years, StewMac has supplied instrument builders and repair shops. Our customer service team really knows how to help if you run into questions.

Call 800-848-2273 from 9AM–6PM Eastern time, Monday–Friday.
Email: service@stewmac.com

Thanks for choosing this StewMac kit, and welcome to the world of amp building!

MAKE IT MOD IT FIX IT StewMac®

Tips for using this amp

This amp is known for its rich, articulate clean tones and exceptional sustain: creamy, warm, and a little crispy. If you're looking for AC/DC tones, look no further.

This amp is based on the JTM45 circuit, which is nearly identical to the 5F6A Tweed Bassman circuit. The most notable change is the use of a 12AX7 in V1 instead of a 12AY7. This gives them amp more gain right out of the gate as the 12AY7 only has a gain factor of 44 compared to the 12AX7's gain factor of 100.

Despite the wealth of gain in the amp, you will find that it is still very quiet. This is largely due to the large filter caps and the use of the filter choke to smooth out the ripple in the high voltage lines.

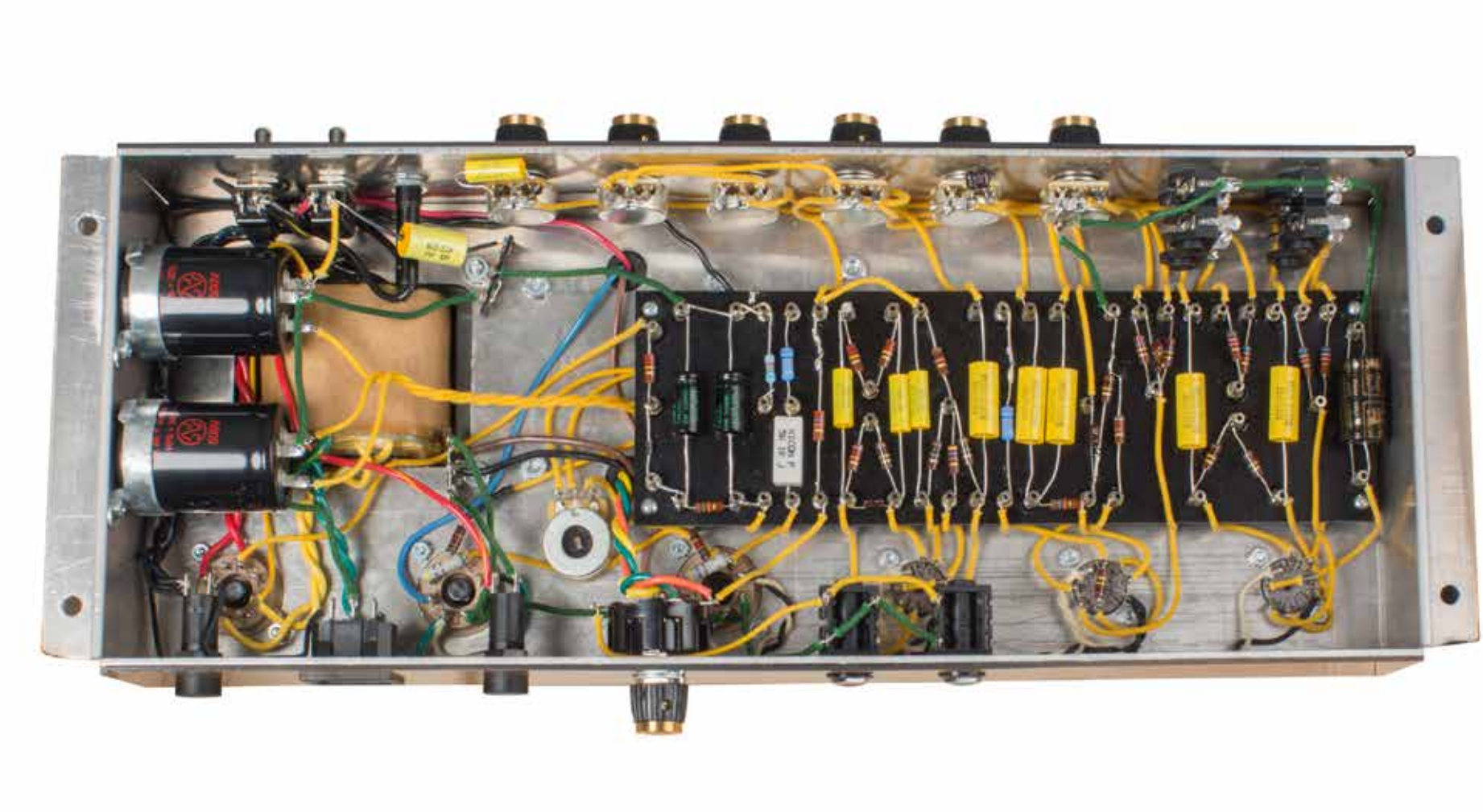
The treble, middle, bass tone stack allows you to precisely dial in the exact tone you are looking for. I like to play humbuckers through the high treble channel with a traditional 4x12 Marshall cabinet. With this setup, I prefer to keep the treble around 5, the bass and middle controls around 4, the presence around 4, and the volume around 6. This positions the amp right on the edge of tube saturation, perfect for kicking on a distortion pedal when you want to take a lead and drive the amp into full-on, tube-saturated glory.

If you are playing through smaller speakers you will probably want to dial the treble and bass back a little bit. If you are using single-coil pickups in your guitar you will most likely want to give yourself a little bump on the bass control and dial your treble back even more.

As with most of these classic amps, it's hard to pull a bad tone from this one. That's why we are still building these circuits half a century later.

Matt Clouston, StewMac

Top view of wired chassis



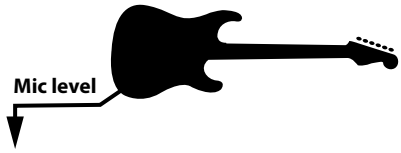
Learning more: secrets revealed in the schematic

You don't need to read a schematic to build this kit. But it's fun to see how the circuit works, and to see the different subcircuits that interact to shape your sound.

Working with the tiny signal from the guitar, the amp creates the power needed to drive the speaker. The signal is affected by the **gain**, **processing**, **output** and **power** stages as it passes through the circuit.

We've color-coded these stages on our schematic, to show how the parts work together. Symbols for components are in the key at the bottom of the frame.

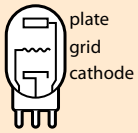
On the **wiring diagram** we build step-by-step in these pages, the parts are easier to recognize. But studying these color-coded stages will help you understand where each component fits into the creation of your sound.



Gain

Line level →

The gain circuit increases the signal to **line level** (about 1 volt), by passing it through a 12AX7 preamp tube where electrons flow from a heated **cathode** to be received by the anode **plate**. The **grid** between these receives the tiny voltage from the guitar, whose varying musical signal controls the flow of electrons to the plate.



This amp's dirt comes from the first gain stage being biased extremely hot: **the small-value 820Ω resistor** reduces headroom and increases distortion.

Processing

Line level →

The processing stage shapes the **tone**. This amp has a universal Treble, Middle, Bass tone control. This allows you to shape each section of the three-band equalizer, and being universal means that the tone controls effect both channels.

The Presence control of this amp uses the negative feedback circuit to introduce more high frequency to the signal, this can be heard as more "bite" to the naked ear. But don't be surprised if the sound engineer at your next gig asks you to turn down the presence, it can be extremely abrasive when mic'd up.

The signal is then sent to the phase inverter which uses all of V3. The phase inverter then sends the signal to the output section.

Output

Speaker level →

The output stage increases the line level signal to **speaker level**, which is typically 8 volts or greater.

Two EL34 tubes drive the output transformer. They receive the split signal, 180 degrees out of phase, amplify those signals, and send them to the output transformer to be recombined into one signal.

This transformer adjusts the impedance to 4, 8, or 16 ohms to drive an external speaker. This amp has an adjustable fixed bias, which means you need to check the bias and possibly make adjustments when you change power tubes.

Negative feedback

The negative feedback loop flattens and extends the amp's frequency response, reducing distortion generated in the output stage. This makes the amp's sound cleaner and more hi-fi. Some players disable this loop completely or add a potentiometer in place of the resistor to create a "grit control." We don't recommend this, because it places stress on the output transformer.

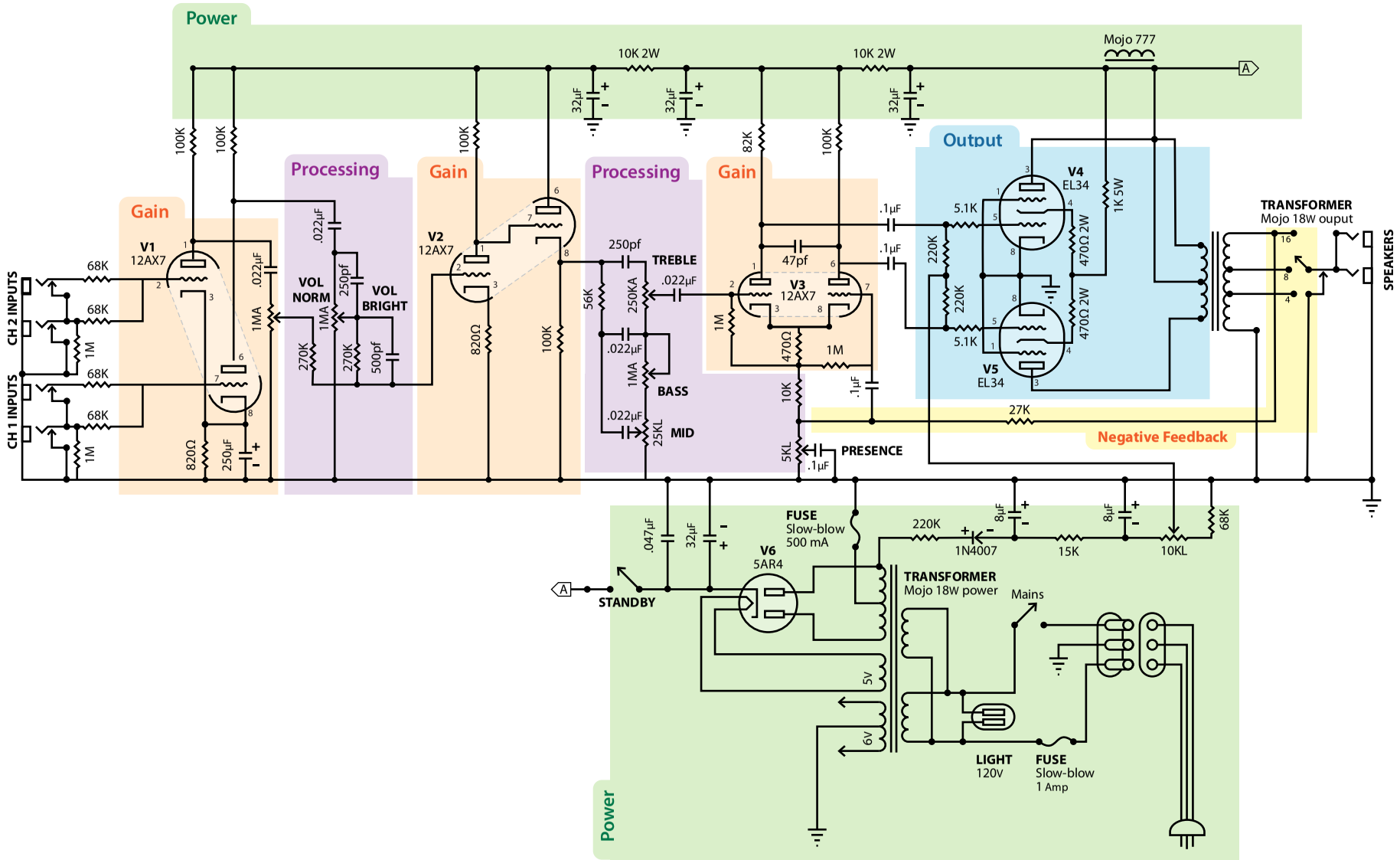
Power

The power supply stage provides power to the other circuit stages, as well as the tube heaters.

This circuit receives the **AC power** from your wall and passes it through the power transformer to create higher voltage. The electricity then goes to the rectifier, which converts it to a pulsing **DC current**.

This then passes through the filter choke and the filter capacitors. The filter capacitors filter out the pulsing to create a smooth current. As each cap smoothes a bit more, the current is also passing through resistors that lower the voltage.

As the signal from the guitar becomes more amplified, the ripple of DC current becomes less evident and the fully filtered current is sent to the most sensitive part of the amplifier, the first pre-amp tube in the Gain stage.



StewMac® ICON KITS #10736

Resistor | Capacitor | Electrolytic Cap. | Potentiometers | Diode | Transformer | Jack | Ground | Shielded cable | Preamp tube (grid, plate, cathode) | Power tube (grid, plate, screen, cathode) | Rectifier tube (plate, plate, cathode, filament)

'62 BRIT-PLEX 45W

ORIGINAL BRITISH CIRCUIT

It's your amp. Your tone. You built it!

StewMac **ICON KITS** teach you the world of amp building, then turn you loose with amazing hand-built tone machines!

'57 MINI TWEED 5W AMP KIT

One-knob titan of tone.

A timeless studio darling whose tiny size hides tremendous punch and versatility.

The 5F1 circuit was meant to be a student amp but wasn't kid stuff for long; rock's finest guitarists hijacked it for some of the greatest songs ever recorded. Listen to Eric Clapton ("Layla") or Joe Walsh ("Rocky Mountain Way") while you build this amp!

Our simplest kit; the quickest way to get into amp building.

#10730 5 WATTS / 8" SPEAKER / ORIGINAL 5F1 CIRCUIT

DIFFICULTY
HOURS: **6**

'59 TWEED 15W AMP KIT

Dirty little devil that shaped guitar history.

With mysteriously fat saturated tone, this little monster makes it easy to achieve seismic distortion.

This amp's 5E3 circuit is an enigma: Why do the controls on the channel you're NOT using make your tone so great? The answer: Who cares? This is one of the greatest tone monsters ever created! Listen to Neil Young's *Rust Never Sleeps* while building this kit.

Our most popular amp kit and a great learning experience.

#10731 15 WATTS / 10" SPEAKER / ORIGINAL 5E3 CIRCUIT

DIFFICULTY
HOURS: **8**

'65 P-REVERB 15W AMP KIT

Sparkling bright, perfect for the surf.

Plug your single-coils straight in for that signature clean American tone, or go surfing with onboard effects.

The smallest member of the black-panel family to offer reverb and tremolo, this amp made its name as a jangly pop dream machine. Aficionados treasure its early low-end breakup powered by a pair of 6V6 tubes.

Listen to "Surfin' USA" and the great sounds of the Heartbreakers.

#10734 15 WATTS / 10" SPEAKER / ORIGINAL AA1164 CIRCUIT

DIFFICULTY
HOURS: **12**

'66 D-REVERB 22W AMP KIT

Famously clean, with enough guts to gig.

Perfect for recording as well as performing, the D-Reverb produces stinging clarity that absolutely refuses to get lost in the mix.

One of the most popular designs ever, this amp lives in the happy middle between bright clarity and rich distortion. It excels in the studio and on the stage. While capable of crystal clear tones at good volume, you can push this one into beautifully saturated, play-sensitive distortion.

It's all here: clarity, distortion, and rectifier tube sag.

#10737 22 WATTS / 12" SPEAKER / ORIGINAL AB763 CIRCUIT

DIFFICULTY
HOURS: **16**

Beginner-tested. Pro quality.

StewMac **ICON KITS** are fun to build, with friendly instructions to guide you and loads of info to add to your knowledge.

'62 BRIT-PLEX 45W AMP KIT

The original British showstopper.

This amp started a revolution. It's been rocking the world for over 50 years, and we still can't get enough.

Favored by blues and rock players for exceptional sustain and rich creamy tone, the '62 Brit-Plex is chock-full of harmonic gain, yet it still stays articulate and even a little crispy. Put this head on a classic 4x10 cab and watch out!

While building, listen to Gary Moore's "Still Got The Blues."

#10736 45 WATTS / ORIGINAL BRITISH CIRCUIT

DIFFICULTY
HOURS: **12**

'81 BRIT-800 50W AMP KIT

This hairy monster lives to shred.

The defining British circuit that dominated the '80s.

This 50W giant created your favorite heavy rock and metal albums. Used by Slayer and Pixies, and recorded on early Metallica albums, this circuit produces that screaming guitar tone that your mother despises. With solid-state rectification there's no sag, and the distortion created by this circuit is way more about treble than mids or bass.

Listen while building: Smashing Pumpkins' *Siamese Dream*.

#10735 50 WATTS / ORIGINAL BRITISH CIRCUIT

DIFFICULTY
HOURS: **16**

'66 BRIT-74X 18W AMP KIT

Leave your half-stack at home.

Born in London, this little blues blaster earns its living every night, gigging in clubs across the USA.

Launched in 1966, this amp quickly became a low-wattage holy grail. This is a stripped-down blues machine: two channels, one tone knob, no master volume. Buckle up and go where this gritty beast takes you! It comes with a footswitch to kick in the onboard tremolo.

Get the plexi tone without blowing the roof off the joint!

#10732 18 WATTS / 12" SPEAKER / ORIGINAL BRITISH CIRCUIT

DIFFICULTY
HOURS: **12**

'64 REVERB UNIT KIT

Reverb you can't get from a pedal.

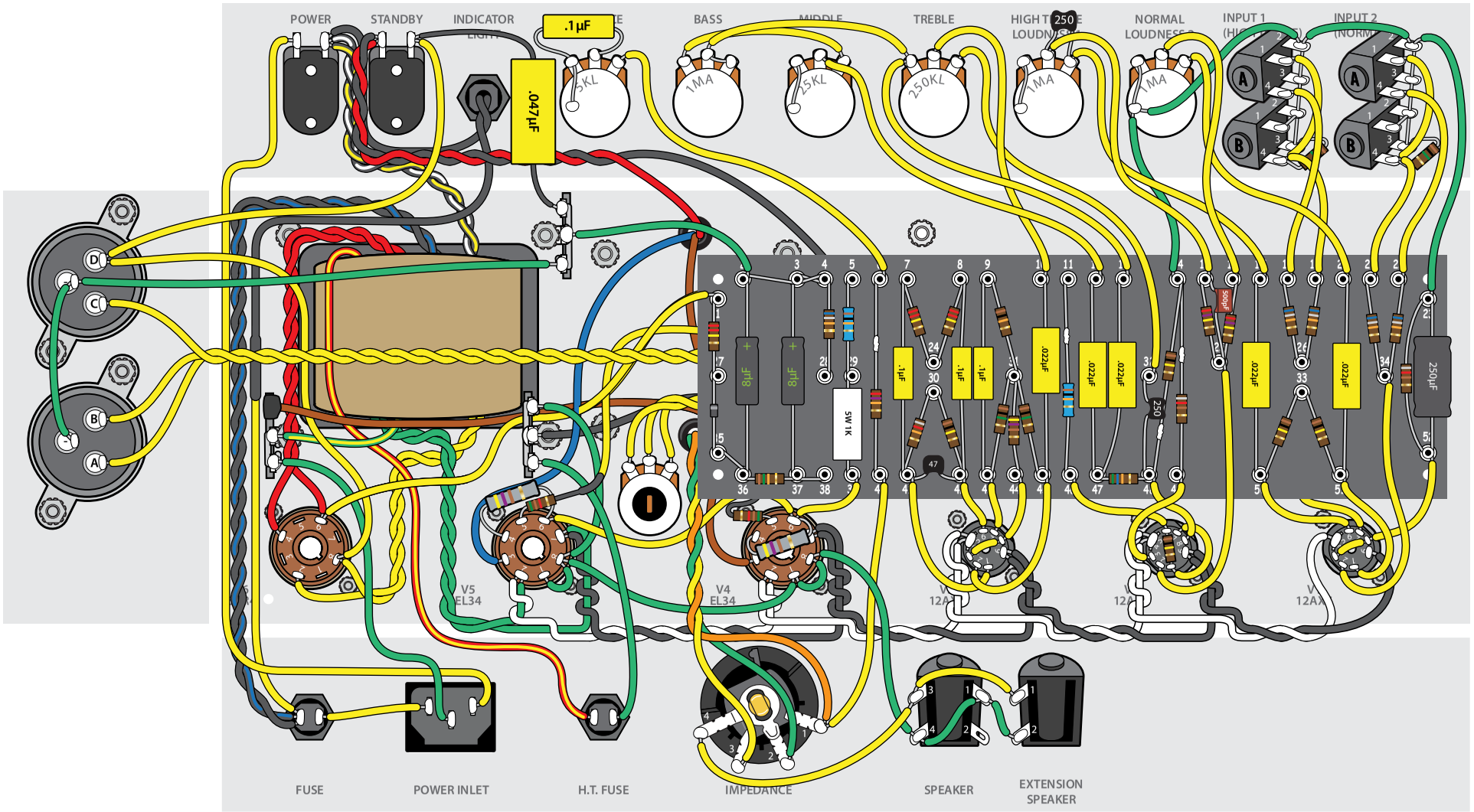
This is the unit that put the waves in surf music! Looks like an amp, sounds like a beach party.

This tube-driven reverb tank relies on good ol' physics for a perfect effect. Your guitar signal travels along two large suspended springs to produce the reverb that launched the iconic surf sound. This isn't a pocket-sized digital simulation; this is the real deal!

Listen to Dick Dale's "Misirlou" while doing this easy build.

#10733 ORIGINAL 6G15 CIRCUIT

DIFFICULTY
HOURS: **8**



’62 BRIT-PLEX 45W

ORIGINAL BRITISH CIRCUIT

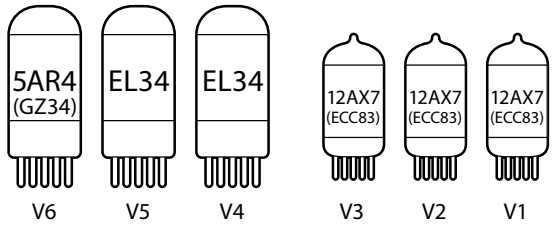
StewMac® ICON KITS

StewMac® ICON KITS

'62 BRIT-PLEX 45W

AMPLIFIER KIT ORIGINAL BRITISH CIRCUIT

DANGER: Unplug the amp before changing tubes.
Tube locations from left to right:



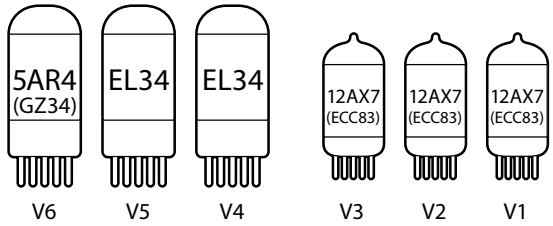
Cut this label on the dotted line with a razor knife and metal straightedge.
Fasten it inside the cabinet using thinned wood glue or contact cement.
The duplicate copy below is included as a backup.

StewMac® ICON KITS

'62 BRIT-PLEX 45W

AMPLIFIER KIT ORIGINAL BRITISH CIRCUIT

DANGER: Unplug the amp before changing tubes.
Tube locations from left to right:



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#10736 Updated March, 2019