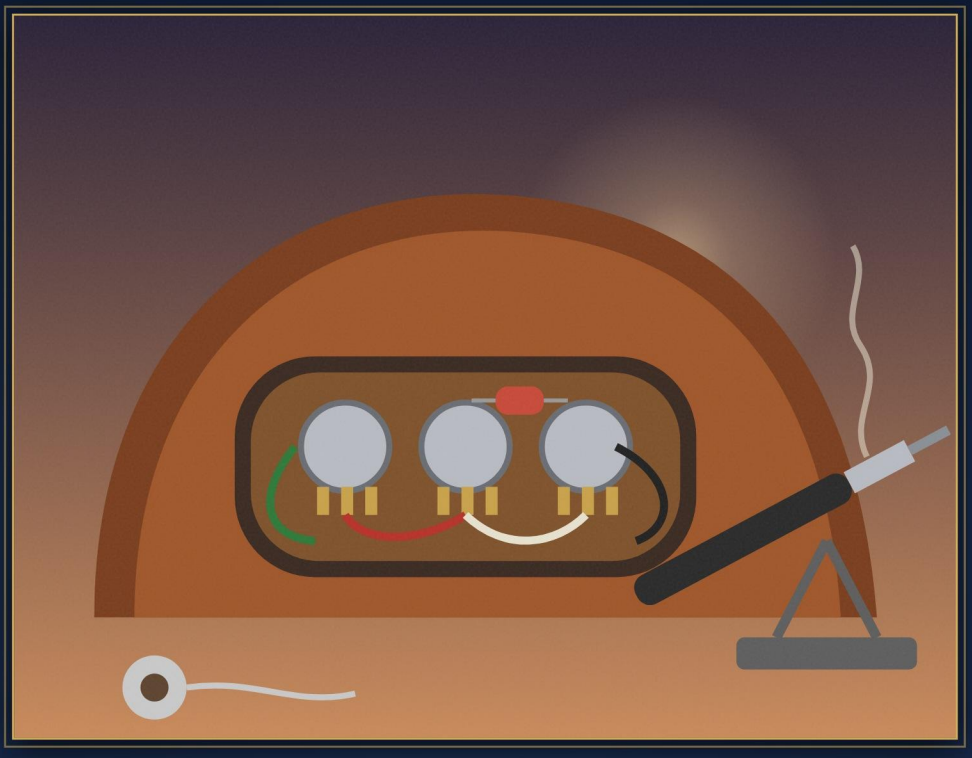
A TRINFINITY GUITAR SHOP GUIDE

Guitar Wiring and Soldering

Fix It and Upgrade It Yourself



Step by Step: Tools, Safe Soldering, Wiring Diagrams, Pickup Swaps, Noisy Pots and Jacks

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Trinfinity Enterprises

Guitar Wiring and Soldering

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Independently published. First edition, 2026.

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Guitar work notice. A soldering iron is hot enough to burn you and start a fire, solder and flux fumes should not be breathed, and lead solder is toxic. Work where there is good air flow, wear eye protection, wash your hands after, and keep tools and chemicals away from children. Never open or work inside an amplifier or anything that plugs into the wall. Amplifiers can hold a deadly charge even when unplugged. Take that work to a qualified technician. Changes to an instrument can affect its value and its warranty.

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Before You Begin

Most guitar electronics problems are simple: a cold solder joint, a dirty pot, a loose jack, or a ground wire that came off. Most upgrades are simple too: a new pickup, a new switch, a better jack. All of them come down to one skill, soldering, and one idea, that every signal needs a path out and a path back to ground.

I build and repair guitars, and I wrote this guide for players who want to do their own wiring work. It covers the tools, how to solder safely, how a guitar circuit works, how to read a wiring diagram, pots and capacitors, common single-coil and humbucker layouts, a pickup swap from start to finish, output jacks, noisy controls, hum and shielding, and a troubleshooting chart.

How to Use This Book

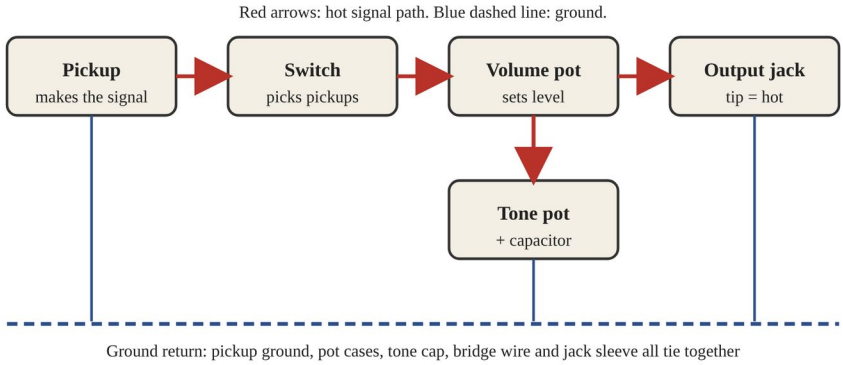
Read Chapters 1 through 4 before you pick up an iron. The later chapters stand on their own. Wiring colors and layouts vary by maker, so always check the diagram that came with your pickups or guitar, and take a photo of the old wiring before you change anything.

What This Book Is and Is Not

This book covers passive guitar electronics: the parts inside the guitar that need no battery. Active pickups, preamps, amplifiers and anything that plugs into a wall outlet are outside its scope. Amplifiers hold dangerous voltages even when unplugged. Leave amp repair to a qualified technician.

Chapter 1: How a Guitar Circuit Works

A pickup is a magnet wrapped in thousands of turns of very thin wire. When a steel string vibrates over it, the moving string makes a tiny electrical signal in the coil. Everything else in the guitar exists to choose that signal, shape it and send it out the jack.



The signal path. The hot signal goes out the jack's tip; everything returns through ground.

Hot and Ground

Every pickup has at least two connections:

- **Hot** carries the signal toward the jack.
- **Ground** is the return path. In a guitar, the ground is shared: the pickup grounds, the backs of the pots, the tone capacitors, the bridge ground wire and the sleeve of the jack all tie together.

If the hot path breaks, the guitar goes silent. If the ground path breaks, the guitar usually hums loudly or buzzes when you touch the strings, or goes silent too.

The Parts

Part	What it does
Pickup	Turns string movement into a signal
Pickup selector switch	Chooses which pickups are on
Volume pot	A potentiometer that sends part or all of the signal to the jack
Tone pot and capacitor	Bleed off treble to ground as you turn the tone knob down
Output jack	Where the cable plugs in. Tip is hot, sleeve is ground
Bridge ground wire	Grounds the strings through the bridge so touching them reduces hum
Shielding	Conductive paint or foil in the cavities, tied to ground, that blocks outside noise

Series and Parallel in One Paragraph

Two pickups or coils in **series** are connected end to end, so the signal passes through both. That gives a louder, thicker sound. This is how a standard humbucker's two coils are wired. In **parallel**, both connect between hot and ground side by side. That is brighter and a little quieter. The in-between positions on many guitars put two pickups in parallel.

Chapter 2: Tools and Supplies

You do not need an expensive shop. StewMac, the guitar repair supplier, says an inexpensive 40-watt soldering pencil will do just fine for guitar wiring.

The Basic Kit

- ☐ Soldering iron, about 40 watts, with a fine conical or small chisel tip
- ☐ Iron stand with a damp sponge or brass tip cleaner
- ☐ Rosin-core solder. StewMac recommends standard 60/40 rosin-core, .032 to .062 inch in diameter, for guitar wiring
- ☐ Wire strippers and small flush cutters
- ☐ Multimeter that reads resistance (ohms) and continuity
- ☐ Desoldering braid (wick) or a solder sucker
- ☐ Small screwdrivers, nut drivers or wrenches for pots and jacks (sizes vary: many are 1/2 inch, others metric)
- ☐ Hookup wire, 22 gauge, in at least two colors
- ☐ Heat-shrink tubing and electrical tape
- ☐ Painter's tape, a soft towel and rags to protect the finish
- ☐ A helping-hands clamp or small vise
- ☐ Safety glasses
- ☐ A small fan or fume extractor
- ☐ Phone camera, for photos of the wiring before you start

Nice to Have

- A temperature-controlled soldering station.
- A pot puller or knob lifter.

- Contact cleaner made for electronics (see Chapter 12).
- A cable tester and a short patch cable for testing.

Lead-Free Solder Lead-free solder works, but it melts at a higher temperature and does not flow as easily. Many guitar techs still use 60/40 rosin-core. If you use leaded solder, follow the safety steps in Chapter 3.

Chapter 3: Solder Safely

Soldering is safe when you respect three things: heat, lead and fumes.

Heat

A soldering tip runs hot enough to give you a serious burn in an instant and to start a fire.

- Always put the iron back in its stand. Never lay it on the bench.
- Keep the cord where you cannot snag it.
- Never catch a falling iron. Let it drop.
- Work on a heat-proof surface, away from paper, rags and finishes.
- Wear safety glasses. Solder and flux can spit, and clipped wire ends fly.
- Unplug the iron when you walk away.

Lead

The Centers for Disease Control and Prevention (CDC) lists soldering among hobbies that may involve exposure to lead. CDC also warns that adults can carry lead dust home on clothes and hands and expose their families without knowing it, and that a blood lead test is the only way to tell whether someone has been exposed. The Occupational Safety and Health Administration (OSHA) lists soldering among jobs with lead exposure, and its take-home card says to wash your hands often and change out of work clothes before going home.

For a home bench, that means:

- Wash your hands with soap and water after soldering and before you eat, drink or touch your face.
- Do not eat or drink at the bench.

- Keep children and pets away from the bench, and clean up clippings and drips.
- Store solder where children cannot get it.
- If you are worried about exposure, ask your doctor about a blood lead test.

Fumes

The smoke from soldering is mostly from the flux, not the metal. The United Kingdom's Health and Safety Executive (HSE) says rosin-based solder flux fume is a top cause of occupational asthma. Its tips include:

- Never overheat the soldering iron.
- Use fume extraction.
- Keep your head out of the plume of solder fume.

At home, work in a ventilated room with a small fan drawing the smoke away from your face, or use a fume extractor. HSE notes that small bench-top boxes are of limited use unless they have a HEPA filter.

The Guitar

- Cover the body around the cavity with a soft towel and painter's tape. A drop of solder or a touch of the iron can burn a finish in a second.
- Loosen the strings and move them aside before you lift a pickguard.
- Keep the iron away from pickup covers, wire insulation you want to keep, and plastic parts.

Chapter 4: Soldering Step by Step

A good solder joint is shiny, smooth and shaped like a small volcano or fillet around the wire. A bad one is dull, lumpy or balled up. Practice on scrap wire and an old pot before you work on a guitar.

Prepare the Iron

1. Heat the iron fully.
2. Wipe the tip on the damp sponge or brass cleaner.
3. Melt a little solder onto the tip so it is bright and shiny. This is called tinning the tip. StewMac says to tin a new tip before first use.

A clean, tinned tip moves heat into the joint. A dirty, black tip does not.

Prepare the Wire

1. Strip a short length of insulation. StewMac suggests usually 1/16 to 1/8 inch for guitar wiring; its pickup-swap video strips about a quarter inch. Expose only what the joint needs.
2. Twist stranded wire so the strands stay together.
3. Tin the wire: touch the iron to the wire and feed a little solder until it soaks in. StewMac says to tin both the wire and the soldering point before you make the joint. A very thin coat is enough.

Make the Joint

1. Hook or hold the tinned wire against the tinned lug.
2. StewMac's rule: apply heat to the connection first, then apply the solder and let it flow over the joint.
3. Use only enough solder to wrap the joint.

4. Pull the solder away, then the iron.
5. Hold the wire still for a few seconds while the solder sets. StewMac warns not to blow on a joint to cool it, because that can make a weak cold solder joint.

Soldering to the Back of a Pot

The back of a pot is a big piece of metal that soaks up heat, so it takes longer.

1. Scuff a small spot with fine sandpaper so solder will stick.
2. Heat the spot and melt a small puddle of solder.
3. Lay the ground wire in the puddle and heat until it sinks in.
4. Remove the iron and hold the wire still.

Do not hold the iron on the pot longer than you need. Too much heat can damage the pot's insides.

Cold Joints

A cold joint happens when the solder never got hot enough to bond, or the wire moved while it set. It looks dull, grainy or balled, and it may work today and crackle tomorrow. The fix is to heat it again, add a touch of fresh solder for new flux, and hold it still.

Removing Solder

- **Wick:** lay desoldering braid on the joint, press the iron on top, and the braid soaks up the solder. Cut off the used end.
- **Solder sucker:** heat the joint, put the nozzle next to it, and press the button.

StewMac's pickup video says to heat each joint only once where you can. Repeated heating can damage parts and lift lugs.

Chapter 5: Reading a Wiring Diagram

Pickup makers and parts suppliers publish wiring diagrams for nearly every layout. They look busy, but they use only a few symbols.

What you see	What it means
A circle with three small tabs	A pot, usually drawn from the back with the lugs showing
A large dot where lines meet	The wires are connected (soldered)
Lines that cross with no dot	The wires are not connected
A small cylinder or disc with two legs	A capacitor
A rectangle with a row of lugs	A selector switch
Lines to the back of a pot	Ground connections
Colored lines	Wire colors. Match them to your maker's chart

Which Way Is the Pot Facing?

Most diagrams draw pots from the back, as you see them in the cavity with the guitar face down. Check the diagram's note. If you are not sure which outer lug is which, use the meter test in Chapter 6. It works on any pot, no matter how the diagram is drawn.

Trace One Path at a Time

1. Put your finger on the pickup's hot wire. Follow it to the switch.
2. Follow the switch output to the volume pot's input lug.
3. Follow the volume pot's middle lug to the jack tip.
4. Now trace every ground line back to the pot backs and the jack sleeve.

If you can trace the hot path from each pickup to the jack tip, you understand the diagram.

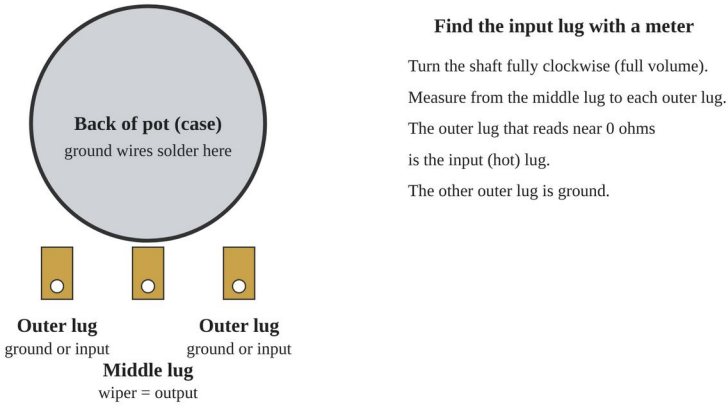
Before You Change Anything

StewMac's first step in a pickup swap is to photograph the original wiring so you can put it back. Take several photos from different angles, in good light, before you cut or unsolder a single wire. Label wires with small pieces of tape if there are more than a few.

Chapter 6: Pots and Capacitors

What a Pot Is

A potentiometer (pot) is a variable resistor with three lugs. The two outer lugs are the ends of a resistive track. The middle lug is the wiper, which slides along the track as you turn the shaft.



A pot from the back. Use the meter test to tell the outer lugs apart.

Volume Pot Wiring

- Input lug: hot from the pickup or switch.
- Middle lug (wiper): output to the jack tip.
- Other outer lug: ground, usually bent over and soldered to the back of the pot.

Turned all the way up, the wiper sits at the input end and the full signal goes to the jack. Turned down, more of the signal is sent to ground.

Values: 250K and 500K

Pots are rated in ohms, written with K for thousands. StewMac's assembly guide says 500K pots are used with humbuckers and 250K

pots with single-coils, and that you can use any value you like. A 250K pot gives a slightly warmer tone than a 500K. Single-coil pickups are bright to start with, so the warmer 250K suits them. Humbuckers are darker, so the 500K lets more treble through.

Taper

Pots also have a taper, marked with a letter.

- **Audio (often marked A or "log"):** the level changes gradually across the turn of the knob. This is the usual choice for volume and tone.
- **Linear (often marked B):** the resistance changes evenly with rotation.

Marking letters are not the same on every brand, so check the maker's listing.

Shaft Types

Pots come with solid or split (knurled) shafts, and in different shaft lengths and bushing sizes. Match the old pot, or the knobs and the hole in the top will not fit.

Tone Capacitors

A tone control is a pot and a capacitor in a line from the hot signal to ground. The capacitor passes treble frequencies more easily than bass. As you turn the tone knob down, more treble drains to ground and the sound gets darker.

Common values are .022 and .047 microfarads (written µF, or sometimes 22nF and 47nF). The larger the value, the darker the sound when the knob is turned down. With the knob turned all the way up, the cap has little effect.

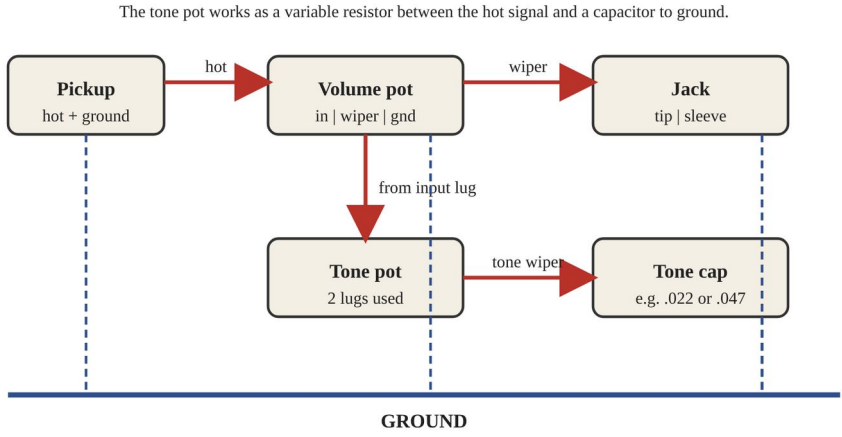
Expensive Caps The cap only affects the sound when the tone knob is turned down, and even then its value matters far more than its type. Do not expect a costly cap to change the sound with the tone knob on 10.

Treble Bleed

Turning a volume pot down usually dulls the sound a little. A treble bleed is a small capacitor (sometimes with a resistor) across the volume pot's input and output lugs. It lets some treble through as you turn down. Ready-made treble bleed kits are sold by guitar parts suppliers. It is a matter of taste; some players like the darker sound as they roll off.

Chapter 7: The Basic Circuit: One Pickup, One Volume, One Tone

Every guitar layout is built from this one circuit. Learn it and the rest are variations.



One pickup, one volume, one tone. The tone pot and cap form a path from hot to ground.

Step by Step

1. Pickup hot to the volume pot's input lug.
2. Pickup ground to the back of the volume pot.
3. Volume pot's ground lug bent over and soldered to the back of the pot.
4. Volume pot's middle lug to the jack tip.
5. Jack sleeve to the back of the volume pot.
6. A wire from the volume pot's input lug to one outer lug of the tone pot.
7. Tone pot middle lug to one leg of the capacitor.
8. Other leg of the capacitor to the back of the tone pot (ground).

9. A ground wire between the backs of the two pots.
10. Bridge ground wire to the back of a pot.

Test Before You Close It Up

StewMac's pickup video tests by tapping the pickup with a screwdriver before reassembly. Plug into an amp at low volume and tap each pickup gently with a steel screwdriver in each switch position. You should hear a clear tap. Turn the volume and tone knobs and listen for smooth changes.

Chapter 8: Single-Coil Layouts

The Three-Pickup Style With a Five-Way Switch

The common three single-coil layout uses a five-way switch, one master volume and two tones.

Switch position	Pickups on
1	Bridge
2	Bridge and middle together
3	Middle
4	Middle and neck together
5	Neck

In positions 2 and 4, two pickups play in parallel. On many guitars the middle pickup is wound and magnetized in reverse, so those two positions cancel hum.

Five-way switches come in several styles, and the lug layouts differ. Always wire from the diagram for your exact switch.

The Two-Pickup Style With a Three-Way Switch

A classic two single-coil layout uses a three-way switch, one volume and one tone.

Switch position	Pickups on
Bridge	Bridge
Middle	Both
Neck	Neck

Common Single-Coil Upgrades

- **Tone control on the bridge pickup.** Many three-pickup guitars leave the bridge pickup with no tone control. Moving a tone pot wire puts it on the bridge too.
- **Neck plus bridge.** A switch or push-pull pot can add the neck and bridge together, a combination the standard five-way does not offer.
- **A better switch or jack.** Cheap switches wear out first. A quality switch is an easy upgrade.

Each of these has many versions. Get the diagram from the parts maker for the exact part you buy.

Single-Coil Pickup Wires

Single-coil pickups usually have two wires: hot and ground. Colors vary by maker. StewMac's pickup video notes that white is often hot and black ground, but the import guitar in the video used red for hot and a bare wire for ground. Check the maker's chart or test with a meter.

Chapter 9: Humbuckers

A humbucker is two coils with opposite magnetic polarity and opposite winding direction. Hum from outside reaches both coils equally and cancels, while the string signal adds. Seymour Duncan explains that the two coils are wired in series, with the start and finish reversed on one coil, for hum cancellation.

Two-Conductor (Single-Conductor) Pickups

Older-style and many vintage-style humbuckers have one shielded wire. Seymour Duncan describes the center wire as hot and the braided outer shield as ground. These are wired like a single-coil: hot to the switch or volume, braid to ground. They cannot be split.

Four-Conductor Pickups

A four-conductor humbucker brings out both ends of both coils, plus a bare ground wire, so you can wire it in different ways.



Seymour Duncan four-conductor colors for standard humbucking wiring.

For standard humbucking wiring with Seymour Duncan colors:

- Black is hot.

- Green and the bare wire go to ground.
- Red and white are soldered together, insulated with heat-shrink or tape, and left unconnected to anything else.

Every brand uses its own colors. DiMarzio, Fender, Gibson, EMG, and import makers all differ. Use the chart from the maker of your pickup.

Coil Splitting

Seymour Duncan describes the usual coil split: a switch connects the joined red and white wires to ground. That shorts out one coil and leaves the other, giving a thinner, single-coil-like sound. The switch can be a mini toggle or a push-pull pot. Note that a split pickup is no longer hum-canceling.

Two Humbuckers, Three-Way Toggle

The classic two-humbucker layout uses a three-way toggle and a volume and tone for each pickup. Each pickup's volume pot output goes to the switch, and the switch output goes to the jack. Because each pickup has its own volume, turning one pickup's volume to zero in the middle position can silence the guitar in some versions of this wiring. That is normal for the classic layout. A modified version moves wires on the volume pots to avoid it. Ask the parts supplier for the diagram you want.

Pickup Height and Covers

Height changes volume and balance more than most players expect. Set pickups using the maker's height chart before you judge a new pickup. Removing or adding covers on a humbucker is a soldering job on the cover itself and can damage the pickup if done badly; leave it to a technician if you are not comfortable.

Chapter 10: A Pickup Swap, Start to Finish

This follows the steps in StewMac's pickup-change video, with shop notes added.

Before You Start

- ☐ New pickup and its wiring chart
- ☐ Photos of the old wiring from several angles
- ☐ Iron hot and tip tinned
- ☐ Towel and tape protecting the finish
- ☐ Strings loosened and moved aside

Steps

1. **Photograph the original wiring.** StewMac makes this the first step, so you can copy the circuit.
2. **Find the old pickup's hot and ground.** Follow its wires to the switch and pots. Note which lug each one lands on.
3. **Remove the pickup.** Unscrew it from the pickguard or body and lift it out with its wires.
4. **Desolder the old leads.** Heat each joint and pull the wire free, or use wick to clear the lug.
5. **Fit the new pickup.** Mount it with the old screws and springs or the new ones supplied. Route the leads the same way the old ones went.
6. **Trim and strip.** StewMac's video trims leads to reach the parts with a little slack, then strips about a quarter inch. Leave enough slack to lift the pickguard later, but not so much that loose wire bunches up.

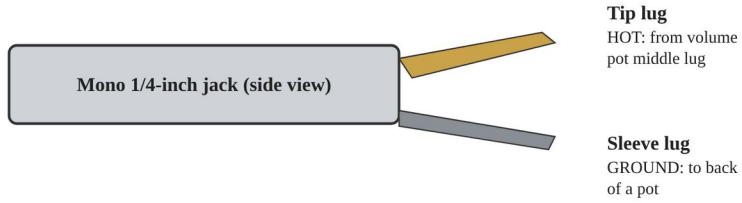
7. **Solder the hot lead** to the same lug the old hot used.
8. **Solder the ground lead** to the back of the pot, where the old one was. StewMac's video solders grounds to the back of the pot.
9. **For a four-conductor humbucker,** join and insulate the series link wires per the maker's chart.
10. **Test.** Plug in at low volume and tap the pickup with a screwdriver in every switch position. StewMac does this before reassembly.
11. **Reassemble and set height.** Put the pickguard or covers back, tune up, and set the pickup height to the maker's chart.

If It Does Not Work

- **No sound from the new pickup:** check the hot joint, then make sure you used the hot lead, not a ground.
- **Very quiet and thin with another pickup:** the new pickup may be out of phase with the other. Swap its hot and ground wires (on a four-conductor humbucker, follow the maker's out-of-phase fix).
- **Loud hum:** a ground came loose, or the bare or braid ground was not connected.
- **Sound only when you press on a wire:** cold joint. Reheat it.

Chapter 11: Output Jacks

The output jack takes more abuse than any other part. Cables get yanked, stepped on and wiggled. A loose or worn jack is one of the most common repair jobs.



A mono jack. Tip is hot, sleeve is ground.

How It Is Wired

A standard guitar jack is a mono 1/4-inch jack with two lugs:

- **Tip lug:** hot. This is the springy arm that presses on the tip of the cable plug. It connects to the volume pot's middle lug (or to the switch output on some layouts).
- **Sleeve lug:** ground, to the back of a pot.

If you are not sure which lug is which, plug in a cable and use a meter to check continuity from the cable tip to each lug.

Some guitars with active electronics use a stereo jack as a battery switch. Do not replace a stereo jack with a mono one without checking the circuit.

Common Jack Problems

- **Loose jack:** the nut works loose and the jack spins, twisting and breaking wires. Hold the jack from inside so it does not spin and tighten the nut. Use a lock washer.
- **Weak spring arm:** the cable falls out or crackles. A worn jack is cheap; replace it.
- **Crackle when you wiggle the cable:** first try a different cable. If the guitar still crackles, check the jack's two solder joints and the spring contact.
- **Broken wire at the jack:** resolder it, with enough slack for the jack to be pulled out for service.

> **Shop Note** When a guitar cuts out, check the cable first and the jack second, before you open up the pickups.

Chapter 12: Noisy Pots and Switches

A scratchy volume knob or a switch that cuts in and out is usually dirt or oxidation, not a broken part.

Try the Easy Fix First

Fender's maintenance article says to assume first that the pot is dirty rather than damaged. Start by turning the knob or working the switch back and forth many times. That alone often scrubs the contacts clean.

Clean With Contact Cleaner

If that does not fix it, Fender recommends a chemical cleaner made for electronics. It names DeoxIT as the most popular, and lists CRC, Max Professional and Permatex as other brands.

1. Get access to the pot or switch. Fender notes this often means removing the knobs, the pickguard or control plate, and sometimes the pot or switch itself.
2. Cover the area with a paper towel to catch overspray. Keep cleaner off the finish.
3. Spray a small amount into the opening in the pot or into the switch contacts.
4. Work the knob or switch back and forth so the cleaner gets around.
5. Fender adds: don't inhale it. Work with good ventilation.

When to Replace

Fender says pots and switches should be replaced once they are too far gone. Signs include a crackle that comes right back after cleaning, a dead spot in the rotation, a loose shaft, or a switch that will not hold position. A new pot or switch costs little. Match the

value, taper, shaft and bushing, and wire it exactly as the old one, using your photos.

Chapter 13: Hum, Buzz and Shielding

Some hum is normal, especially with single-coil pickups near lights, computer screens and dimmer switches. A sudden change in noise usually means a ground problem.

Ground Problems

- **Hum that drops when you touch the strings:** usually normal for single-coils, because your body becomes part of the ground through the bridge ground wire.
- **Loud hum that does not change when you touch the strings:** the bridge ground wire may be broken.
- **Loud hum or buzz with no other change:** a ground wire may have come off a pot back, or the jack sleeve may have lost its connection.

Check every ground with a meter: from the jack sleeve to each pot back, to the bridge, and to each pickup ground. Every reading should be close to zero ohms.

Shielding

Shielding is a layer of conductive paint or copper foil in the control and pickup cavities, connected to ground. It helps block outside electrical noise from reaching the wiring.

StewMac's assembly guide says all of the shielding must be in contact with ground. It lists several ways to do that: solder a wire directly to copper foil, rely on contact between a pot housing and the foil, or screw a brass solder lug into the cavity wall and run a wire from it to the volume pot casing.

Shielding Tips

- Cover the cavity walls and floor, and the back of the pickguard or control cover, so they connect when closed.

- Make sure the shielding does not touch any hot lug or hot wire. That shorts the signal to ground and the guitar goes silent.
- Use a meter to check that every shielded surface reads near zero ohms to the jack sleeve.

Shielding reduces some noise. It does not make single-coil pickups hum-free. Only hum-canceling pickup designs do that.

Chapter 14: Troubleshooting Chart

Symptom	Likely cause	What to check
Guitar is dead, no sound	Cable, jack, or broken hot wire	Try another cable. Check jack tip joint. Check volume pot middle lug
Cuts out when cable moves	Worn jack or cable	Swap cable. Tighten or replace the jack
One pickup dead	Broken lead or bad switch contact	Check that pickup's hot joint. Clean or replace the switch
Thin, quiet sound with two pickups on	Out of phase	Reverse one pickup's leads (per maker's chart)
Loud hum, not reduced by touching strings	Bridge ground broken	Meter test from bridge to jack sleeve
Loud buzz everywhere	Loose ground at pot or jack	Meter every ground to the jack sleeve
Scratchy knob	Dirty pot	Work the knob, then contact cleaner
Switch crackles or cuts out	Dirty or worn switch	Clean, then replace if needed
Tone knob does nothing	Cap or tone pot not connected	Check cap leads and tone pot joints
Volume jumps from off to full	Wrong taper or wired backward	Check the taper and the input and ground lugs
Guitar goes silent with volume up	Hot shorted to ground	Look for a stray solder blob or shielding touching a hot lug
Works until you press on a joint	Cold solder joint	Reheat with fresh solder

Use a Meter

A meter turns guessing into checking. The two tests you will use most:

- **Continuity:** does a wire connect two points? Use it for every ground and every hot path.

- **Resistance at the jack:** plug a cable into the guitar, turn the volume all the way up, and measure between the cable plug's tip and sleeve. A reading close to zero means a short. An open reading (no number) means a break in the hot path. A reading in the thousands of ohms means the pickup is reaching the jack. Pickup makers publish the expected readings for their models.

Bench Checklist

- ☐ Photos of the original wiring taken
- ☐ Finish protected with towel and tape
- ☐ Room ventilated or fume extractor on
- ☐ Iron in its stand, tip clean and tinned
- ☐ Maker’s wiring chart for each new part
- ☐ Every joint shiny and solid; no stray solder
- ☐ Every ground checked with a meter
- ☐ Screwdriver tap test in every switch position
- ☐ Hands washed when done; clippings cleaned up

Glossary

Audio taper. A pot whose level changes gradually, the usual choice for volume.

Bridge ground. A wire from the bridge to ground that grounds the strings.

Cold joint. A weak solder joint that did not bond properly.

Coil split. Shorting one coil of a humbucker to ground for a single-coil sound.

Continuity. An unbroken electrical connection between two points.

Flux. A cleaning agent inside rosin-core solder that helps it flow and bond.

Hot. The signal wire.

Lug. A metal tab on a pot, switch or jack that a wire is soldered to.

Out of phase. Two pickups whose signals partly cancel, giving a thin, hollow sound.

Parallel. Connected side by side between hot and ground.

Series. Connected end to end so the signal passes through both.

Shielding. Conductive paint or foil in a cavity, tied to ground, to block noise.

Tinning. Coating a tip or wire with a thin layer of solder before making a joint.

Wiper. The moving contact in a pot, connected to the middle lug.

Acronyms

CDC. Centers for Disease Control and Prevention

HEPA. High-efficiency particulate air (filter)

HSE. Health and Safety Executive (United Kingdom)

K. Thousand, as in 250K ohms

nF. Nanofarad

OSHA. Occupational Safety and Health Administration

µF. Microfarad

Sources

All web pages were read on November 18, 2026.

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About This Book

Guitar Wiring and Soldering, Step by Step is part of a set of free plain-language guides from Trinfinity Enterprises, alongside the Trinfinity guitar books. Safety information was checked against the sources listed as of November 18, 2026. Wiring colors and layouts vary by maker; always follow the chart for your parts. This book is general information. If you find something that has changed or needs correcting, please write to andrew@trinfinityenterprises.com.