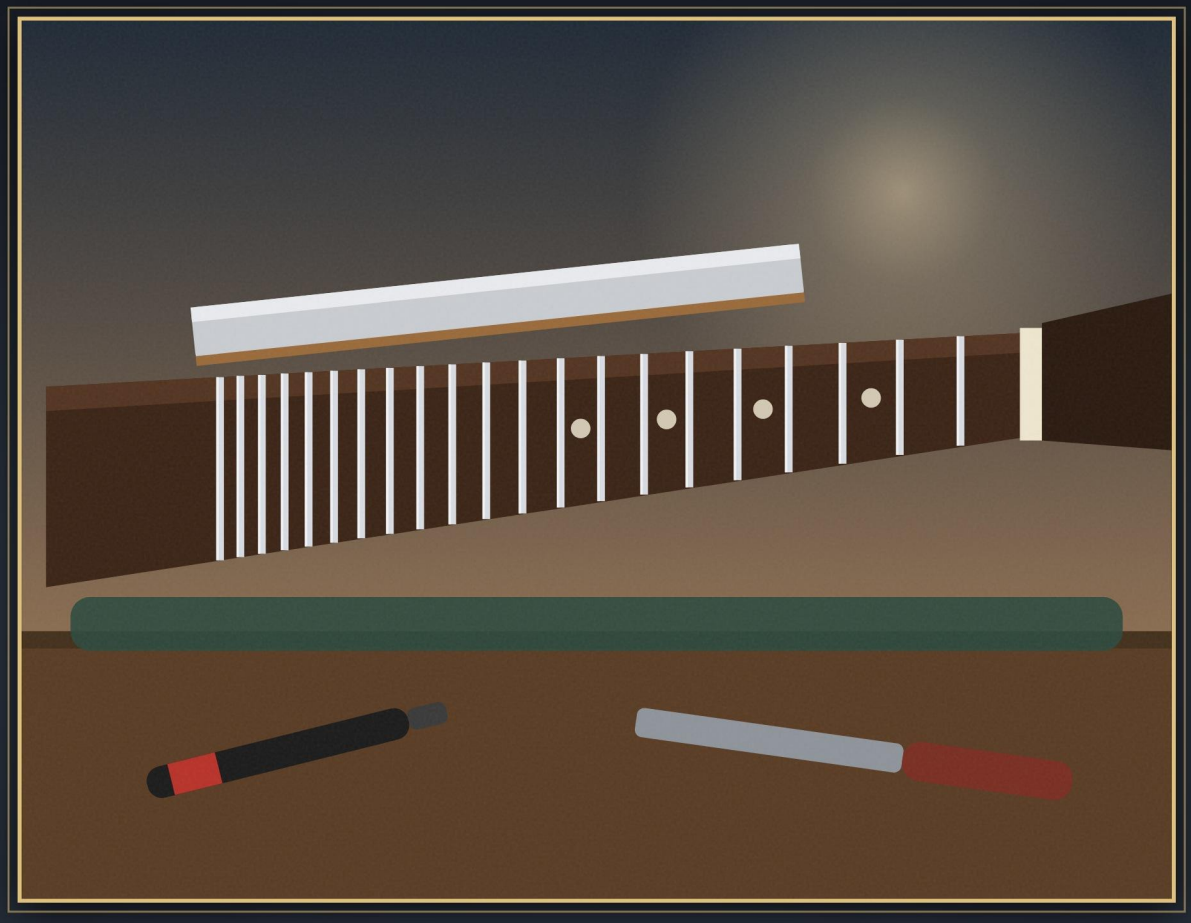
A TRINFINITY GUITAR SHOP GUIDE

Fret Work, Step by Step

A Shop Procedure for Frets That Play Clean



Leveling, Crowning, Polishing and Knowing When to Refret

Andrew Dominguez

Trinfinity Enterprises

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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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Contents

Before You Begin 1
- How to Use This Guide 1
- What This Guide Is and Is Not 1

Chapter 1: How Frets Work and How They Wear 2
- The Parts of a Fret 2
- How Frets Wear 2
- Other Ways Frets Go Wrong 3
- The Fret Work Ladder 3
- How Much Can a Fret Lose? 4

Chapter 2: Tools, Materials and Safety 5
- Measuring and Diagnosing 5
- Leveling, Crowning and Dressing 5
- Why Not Make Your Own Beam? 6
- Safety 6

Chapter 3: Diagnosing: Buzz Map, Rocker Test and Relief Check 7
- Step 1: Rule Out the Easy Causes 7
- Step 2: Make a Buzz Map 7
- Step 3: The Rocker Test 8
- Is It Lifted or Just Tall? 9
- Step 4: The Relief Check 9
- Step 5: Measure What Is Left 9
- Reading the Results 10

Chapter 4: Set the Neck First: Relief and Straightness 11
- Why Straight, Not Relief? 11
- Strings On or Strings Off? 11
- Truss Rod Rules 11
- Support the Neck 12
- Record It 12

Chapter 5: Masking and Taping 13
- What to Cover 13
- Masking the Fretboard 13
- Taking Tape Off 13

Chapter 6: Leveling 14
- Before You Start 14
- Flat Beam or Radius Block? 14
- The Marker Is Your Gauge 14
- Full Leveling, Step by Step 15
- Fall-Away 16
- Spot Leveling One Fret 16

Mistakes to Avoid..... 18
Chapter 7: Crowning.....17
Crowning Files..... 17
Step by Step..... 19
Reading the Line..... 18
Mistakes to Avoid..... 18
Chapter 8: Polishing.....19
What to Polish With..... 19
Step by Step..... 19
Check Your Polish..... 20
A Note on Steel Wool..... 20
Chapter 9: Fret End Dressing and Fret Sprout.....21
What Fret Sprout Is..... 21
Fix the Humidity First..... 21
When to Stop and Send It Out..... 22
The Bevel Angle..... 22
Filing the Ends Flush..... 22
Rounding the Corners..... 22
Polish and Clean Up..... 23
Will It Come Back?..... 23
Chapter 10: Checking Your Work and the Final Setup.....24
Check the Frets Bare..... 24
String Up and Set Up..... 24
The Play Test..... 24
Record the Results..... 25
Chapter 11: Notes for Acoustics, Basses and Other Necks.....26
Steel-String Acoustics..... 26
Basses..... 26
Classical and Nylon-String Guitars..... 26
Scalloped and Unusual Boards..... 27
Guitars With Finished Maple Boards..... 27
Guitars With Binding..... 27
Chapter 12: Partial Refret or Full Refret.....28
Signs It Is Time..... 28
Partial Refret..... 28
Full Refret..... 28
Special Cases..... 29
Questions to Ask a Shop..... 29
Chapter 13: Fret Wire: Nickel Silver, Stainless and Gold Alloys.....30
How Sizes Are Named..... 30
Common Sizes..... 30
How Size Feels..... 31

Materials ... 31
Stainless or Nickel Silver? ... 31
Does Material Change the Tone? ... 31
Chapter 14: When to Send It Out ... 32
Send It Out When ... 32
What a Good Fret Job Includes ... 32
Practice First ... 32
A Last Word ... 33
Fret Job Record ... 34
Final Check ... 38
Glossary ... 39
Acronyms ... 40
Sources ... 41
About This Book ... 42

Before You Begin

Fret wear is the most common repair on a guitar that gets played. Strings press into the same spots on the same frets thousands of times, and the metal slowly gives way. The first sign is usually a buzz on one or two notes, or a bend that catches and dies. Players tell me the guitar just started buzzing one day, and most of the time the frets have been wearing for years. The buzz is just the day the wear finally showed up.

I build and repair guitars at Trinfinity Enterprises, and I have worked on guitars for more than 20 years. This guide is written the way I write my shop procedures: what to check first, what tools to set out, the steps in order, what to measure, and when to stop. It covers diagnosing the problem, getting the neck right before you touch a fret, masking, leveling, crowning, polishing, dressing the fret ends, checking your work, and deciding when frets are too far gone and the guitar needs a partial or full refret.

How to Use This Guide

Read the whole guide once before you pick up a file. The chapters follow the order of the job, and the order matters. Most bad fret jobs I see were done in the wrong order: frets leveled on a neck that was not set straight, or crowned before every fret was level.

Chapters 1 through 4 are about deciding whether the frets need work at all. A surprising number of fret problems turn out to be relief, nut height or humidity, and those cost nothing in fret metal to fix. Chapters 5 through 10 are the procedure itself. Chapter 11 has notes for acoustics, basses and other necks. Chapters 12 through 14 cover refrets, fret wire and knowing when to hand the job to a shop. At the back you will find a fret job record to copy for each guitar, a final checklist, a glossary and the sources I used.

What This Guide Is and Is Not

This is a shop procedure for leveling, crowning and polishing the frets on a steel-string guitar, electric or acoustic, with notes on refrets. It does not teach you how to pull and install frets, how to plane a fretboard, or how to do a neck reset. Those jobs need tools, jigs and practice that go well beyond a book.

Every number in this guide comes from a guitar maker or a supplier, and the source is named where the number appears. Makers do not all measure the same way, so when your guitar’s maker publishes its own number, use theirs.

Chapter 1: How Frets Work and How They Wear

A fret is a strip of metal wire pressed into a slot across the fretboard. When a player presses a string down behind a fret, that fret becomes the end of the vibrating string and sets the note. For a note to ring clean, the string has to touch the fret it is pressed against and clear every fret in front of it. Fret work is all about keeping that true up and down the neck.

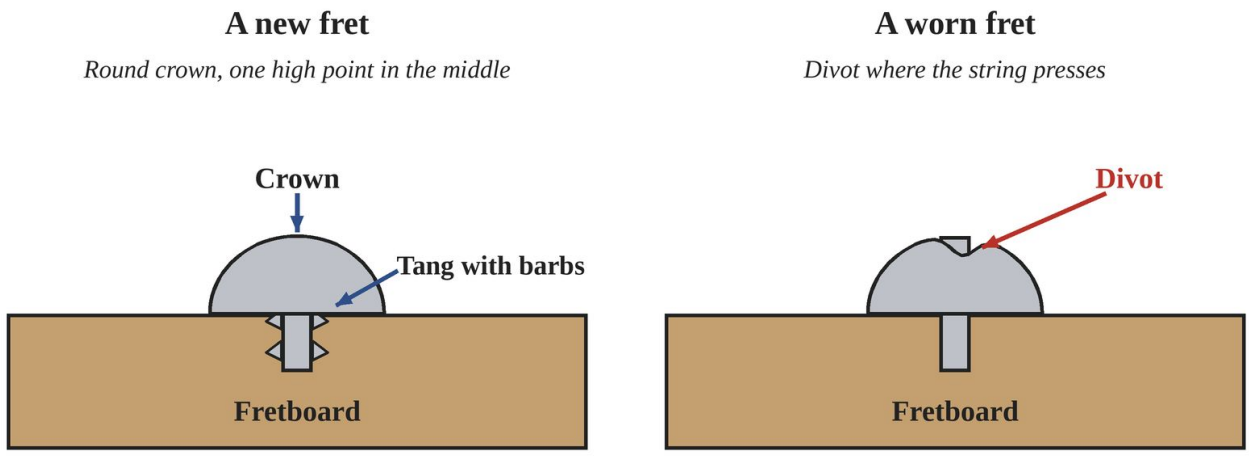


Figure 1. A fret in cross section, new and worn.

The Parts of a Fret

Seen from the end, fret wire looks like a mushroom. The rounded top is the **crown**. The thin leg underneath is the **tang**, and it has small barbs that bite into the wood of the fret slot and hold the fret in place. The crown has two sizes that matter: its width along the neck and its height above the board. Chapter 13 covers wire sizes.

A new crown is round on top, so the string touches it at one narrow line. That narrow contact point is what gives a fretted note a clear pitch. When the top of a fret gets flat or dented, the string touches a wider spot, and the note can lose clarity and sound a little off.

How Frets Wear

Frets wear where the strings press on them. The low frets near the nut usually go first, because that is where most open chords and riffs live. On those frets you will see small dents, called **divots**, right under the strings. Wound strings on the bass side wear wider, shallower grooves. Plain strings on the treble side wear narrower, deeper ones. Players who bend a lot often wear flat spots across the top of the frets in the middle of the neck.

A worn fret causes two problems. First, the string pressed behind the fret above it can sit lower than it should, so it buzzes against the worn fret or a neighbor. Second, the fret in front of a divot may now be the high spot, and the note behind it buzzes or dies. Frets do not have to be far off to cause trouble. Manfred Zollner, who wrote a large reference work on the physics of the electric guitar, shows that a single fret standing just 0.1 mm (about .004 inch) too high spoils the note at the fret before it.

Other Ways Frets Go Wrong

- **A lifted fret.** The fret has risen out of its slot, often at one end. It sits high and may click or move when you press it. A lifted fret needs to be reseated, not filed.
- **Fret sprout.** The fretboard shrinks in dry air and the metal does not, so the fret ends stick out past the edge of the board. Chapter 9 covers it.
- **A high fret from the factory.** Frets are pressed or hammered in, and one can sit a hair higher than its neighbors from day one.
- **A rising fingerboard extension.** On many acoustics, the part of the fretboard that sits on the top over the body can rise over the years as the top moves. The frets there end up high relative to the rest of the neck. StewMac notes that a rising fingerboard tongue means fret work.

The Fret Work Ladder

Think of fret work as a ladder. Each step removes more metal and takes more time than the one below it. Always start at the lowest step that fixes the problem.

Step	What it fixes	Metal removed	Who does it
Clean and polish	Tarnish, gritty bends	Almost none	Any careful owner
Dress the fret ends	Sharp or sprouted ends	Only at the ends	Careful owner (not on bound necks)
Spot level one fret	A single high fret	A little, on one fret	Careful owner with the right tools
Full level, crown and polish	Wear, divots, uneven frets	A little from every fret	Experienced hands
Partial refret	A few frets too worn to level	Old frets replaced	Repair shop
Full refret	Frets too low to level again	All frets replaced	Repair shop

A full level, crown and polish is often called a **fret dress**, or a level and crown. It is the heart of this guide.

How Much Can a Fret Lose?

New fret wire comes in many heights, so there is no single point where a fret is too low. StewMac notes that frets lose about .004 to .010 inch of height just during installation and leveling. That is before any wear. A repair writer at Premier Guitar uses about .038 inch of remaining height as his line for typical modern frets, but some vintage-style wire is barely that tall when it is new. Measure what is left before you decide (Chapter 3 shows how), and if a level would leave the frets lower than you or the player want, skip to Chapter 12.

A word about removing metal Everything you file off a fret is gone for good. A level and crown can take frets down a little, and every guitar can only take so many of them before it needs new frets. Work slowly, check often, and take off the least metal that fixes the problem.

Chapter 2: Tools, Materials and Safety

Fret work does not need a big shop, but it does need the right tools. A wrong file, a bent straightedge or a homemade sanding block causes more ruined frets than anything else. Buy good tools for the steps you plan to do, and borrow or skip the rest.

Measuring and Diagnosing

Tool	What it is for
Notched straightedge	Checking the neck itself for straightness with the strings on, by reading the fretboard between the frets
Plain straightedge, 18 to 24 inches	Checking frets for level and the neck for straightness with the strings off
Fret rocker	Finding a single high fret by spanning three frets at a time
Feeler gauges	Measuring relief and gaps in thousandths of an inch
Capo	Holding the strings at the first fret for relief checks
6 inch steel rule	Measuring string height
Fret height gauge or calipers	Measuring how much fret is left
Truss rod wrench that fits snugly	Setting the neck
Bright light	Seeing divots, gaps and lifted frets

Leveling, Crowning and Dressing

Tool	What it is for
Leveling beam or radius block	Taking the frets down to one even plane. A long beam for full leveling, a short block or file for one fret
Self-adhesive abrasive paper	The cutting surface on the beam
Fine-point permanent marker	Coloring the fret tops so you can see where you have cut
Crowning file	Rounding the tops of the frets after leveling
Fret end file or fixed-angle beveling file	Bringing sprouted ends flush and setting the bevel
Fret end dressing file	Rounding the corners of each fret end
Fretboard guards	Thin metal or plastic plates that cover the wood around a fret
Low-tack painter’s tape	Masking the board, pickups and body
Fret erasers, micro-mesh pads or fine polishing papers	Polishing out file marks
Neck rest and a padded work surface	Holding the guitar steady
Shop vacuum with a brush	Picking up metal dust as you go

StewMac, whose tools and guides many repair shops use, recommends a smooth-cut mill file for fret end work and warns against files with widely spaced or crosshatched teeth and against diamond-coated files for that job. Its fixed-angle beveling file is set at 35 degrees. A fixed-angle tool takes the guesswork out of fret ends, and it is worth buying if you plan to do more than one guitar.

Why Not Make Your Own Beam?

A leveling beam has one job: to be flat. A board from the hardware store, a level or a piece of aluminum angle may look straight and still be off by more than the wear you are trying to remove. A machined beam is made flat on purpose. If you do build your own, check it against a known straightedge in good light before every job.

Safety

Fret work is quiet, slow hand work, and that makes it easy to get careless. These are the rules I hold to at the bench.

1. **Wear eye protection.** Files throw small slivers of metal, abrasive paper sheds grit, and a fret end can snap off when you clip or file it. Safety glasses go on before any file or abrasive touches a fret.
2. **Control the dust.** Leveling and polishing make fine metal dust and abrasive dust. Vacuum as you go instead of blowing it off. Blowing just puts it in the air and in your eyes. A dust mask is a good idea when you sand, and wash your hands before you eat.
3. **Keep steel wool away from pickups.** Steel wool sheds tiny steel fibers. On an electric, the pickup magnets pull those fibers in and hold them, and they can work their way into pots and switches. On an electric, do not use steel wool at all. Use fret erasers, micro-mesh or fine synthetic pads. On an acoustic with no magnetic pickup, 0000 steel wool can be used with the soundhole covered and every fiber vacuumed up after. That is your call to make, and it takes extreme care.
4. **Respect sharp edges.** Fret ends can be sharp as a blade before they are dressed. So can the edge of a fret file. Keep your fingers behind the file and out of its path.
5. **Go easy with power tools.** A rotary tool or buffing wheel can groove a fret, burn through a finish or catch an edge and throw the guitar off the bench in a split second. I do not use them on frets, and I do not recommend them for anyone learning this work.
6. **Mind chemicals.** Some polishes, cleaners and tape removers are flammable or give off fumes. Read the label, use them with fresh air, and keep them away from children.

Shop rule If you feel rushed, stop. A guitar that waits a day is better off than one with a file gouge in the finish.

Chapter 3: Diagnosing: Buzz Map, Rocker Test and Relief Check

Before anyone files a fret, the job is to find out exactly what is wrong. Fret buzz has many causes, and only some of them are frets. The three checks in this chapter take about half an hour and tell you whether you need fret work, a setup, or both.

Step 1: Rule Out the Easy Causes

Buzz can come from a lot of places that are not frets. Check these first.

- **Humidity.** A guitar that has dried out can lose relief, and an acoustic top can sink and drop the action. Check the room. My book *Guitar Care and Maintenance* covers humidity in Chapter 7.
- **Setup.** Too little relief, a back-bowed neck or action set too low all cause buzz that looks like a fret problem.
- **The nut.** If only open strings buzz, and fretted notes are clean, look at the nut slots first.
- **Loose parts.** A loose tuner bushing, a rattling pickup ring, a loose truss rod nut or a strap button can all buzz in sympathy with a note. Tap and listen.
- **How hard the player picks.** A heavy hand can make any guitar buzz. Ask the player to play the problem note the way they normally do, and listen to whether the buzz comes through the amp or is only heard acoustically.

Step 2: Make a Buzz Map

A buzz map tells you where the problem is before you look at a single fret. Tune the guitar to pitch, hold it in playing position, and play every string at every fret with normal force. Mark each note that buzzes or dies.

1. Use the Buzz Map table in the Fret Job Record at the back of this guide.
2. Play each string open, then fret by fret up to the last fret.
3. Put a mark in the box for each note that buzzes. Use a different mark for a note that dies early or “chokes,” especially on bends.
4. When you are done, look for the pattern.

What the map shows	What it usually points to
Open strings only	Nut slots cut too low
Low frets on every string	Too little relief or a back-bowed neck
Middle and upper frets on every string	Too much relief, action too low, or a rising fingerboard extension
One or two notes on one string	A high fret just above the buzzing note, or a divot in the fret under it
Notes choke on bends in one area	A high fret or uneven frets in that area
Buzz across the board after a dry spell	Humidity first, then relief

Remember the rule: when a note at one fret buzzes, the problem is usually the fret just above it, toward the body. If the 5th fret note buzzes, look hard at the 6th fret.

Step 3: The Rocker Test

A fret rocker is short enough to sit on three frets at once. If the middle fret is higher than the two on either side, the rocker rocks on it like a seesaw.

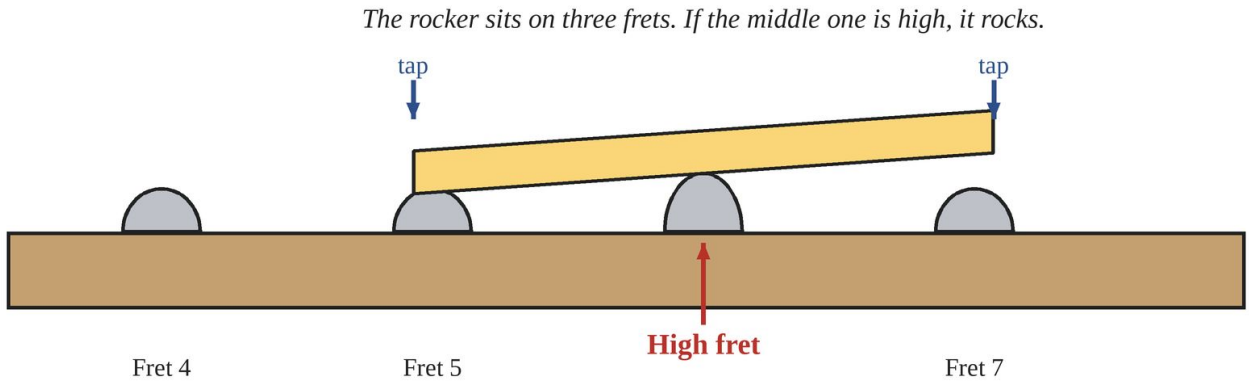


Figure 2. A fret rocker spans three frets. If it rocks, the middle fret is high.

1. Take the strings off or slack them and move them aside.
2. Stand the rocker on edge across three frets, under the path of the low E string.
3. Tap each end of the rocker lightly. A solid click with no movement means those three frets are even. A rock means the middle fret is high.
4. Move up one fret and repeat, all the way up the neck.
5. Do the same under the middle strings and under the high E path. A fret can be high on one side only.
6. Mark each high fret with a small piece of tape on the side of the neck, and write it in the Fret Job Record.

StewMac describes its fret rocker the same way: it spans three frets and rocks to show uneven fret heights.

Is It Lifted or Just Tall?

Look closely at both ends of every high fret where the fret meets the board. If you see a dark gap under the crown, or the fret moves or clicks when you press on it, the fret has lifted. Filing a lifted fret removes good metal from a fret that should be pressed back into its slot. Reseating and gluing a lifted fret comes before any leveling.

Step 4: The Relief Check

Relief is the slight forward bow in a neck under string tension. Measure it now, with the strings on and tuned, so you know where the neck stands before you start.

1. Tune to pitch and put a capo at the first fret.
2. Hold the low E string down at the last fret. On an acoustic, hold it at the fret where the neck meets the body.
3. Measure the gap between the bottom of the string and the top of the 8th fret with feeler gauges.
4. Write the number in the Fret Job Record.

Fender publishes starting relief numbers measured this way, at the 8th fret. For its electrics it lists .012 inch on a 7.25 inch radius neck, .010 inch on a 9.5 to 12 inch radius, and .008 inch on a 15 to 17 inch radius. Fender calls these minimums meant as guidance. PRS lists a relief spec of .005 to .010 inch for all its guitars. If your guitar's maker publishes its own number, use it.

Step 5: Measure What Is Left

If the frets look worn, measure their height before you plan a level. Use a fret height gauge or calipers on a fret that the strings rarely touch, such as the last fret, and then on the worst worn frets. The difference tells you how deep the wear is. A level has to bring every fret down to the bottom of the deepest divot. If that would leave the frets too low, the guitar needs a partial or full refret instead (Chapter 12).

Reading the Results

What you found	What to do next
Buzz map points to the nut	Nut work, not fret work
Relief out of range, rocker test clean	Set the neck and do a setup. No fret work yet
One or two high frets, no deep wear	Reseat if lifted; otherwise spot level (Chapter 6)
Several high frets or wear on many frets	Full level, crown and polish (Chapters 4 to 10)
Divots deeper than a level can safely remove	Partial or full refret (Chapter 12)
Sharp fret ends only	Fix humidity, then dress the ends (Chapter 9)

Chapter 4: Set the Neck First: Relief and Straightness

You cannot level frets on a neck that is bowed. The leveling beam will follow the bow and take metal off the wrong frets, and when the neck is set back to normal the frets will no longer be level. So before any abrasive touches a fret, the neck itself has to be as straight as you can get it.

Why Straight, Not Relief?

For playing, a neck needs a little relief. For leveling, it needs to be straight, so that the frets are leveled to a flat plane. Once the frets are level on a straight neck, you can put back whatever relief the player likes and the frets will follow the neck evenly. StewMac's basic setup guide starts from a straight neck for the same reason, and it fixes frets and the nut before fine-tuning the rest.

Strings On or Strings Off?

This is the tricky part. A neck behaves a little differently with the strings off than it does at pitch. The truss rod is set to fight string tension, and when the strings come off, a neck can pull back. Professional shops use a neck jig, which holds the neck in its strung-up shape while the strings are off. Most home benches do not have one.

Without a jig, the usual approach is this:

1. With the strings on and tuned, adjust the truss rod until the neck is close to straight. A notched straightedge, which rests on the fretboard between the frets, shows you the neck itself without reading the frets.
2. Take the strings off and let the neck sit for a while.
3. Check again with a plain straightedge across the frets along the bass side, the middle and the treble side. Fine-tune the truss rod until the neck reads straight with the strings off.
4. Write down which way and how far you turned the rod, so you can return to a playing setting later.

Some necks hold their shape well with the strings off. Others move a lot. If you find the neck keeps changing, or it has a twist or a hump that the truss rod will not take out, stop. That neck needs a repair shop with a jig, and maybe a fretboard plane, before any fret work.

Truss Rod Rules

- **Small turns.** StewMac says that with a truss rod in good working order you probably won't need more than an eighth of a turn either way. Turn no more than an eighth of a turn at a time, then check again.

- **Know your direction.** Look at the adjusting nut from the end you are turning it from. Clockwise tightens the rod and straightens the neck. Counterclockwise loosens it and lets the strings pull in more relief.
- **Use a wrench that fits.** A loose wrench rounds the nut, and a rounded truss rod nut is a real repair.
- **Mark your starting point.** A dab of pencil or a small piece of tape on the nut lets you count turns and go back.
- **Give it time.** Necks do not always move right away. Let the guitar sit, then check again.
- **Stop if it binds.** If the nut is stiff, creaks or takes real force, stop. StewMac warns that using muscle on a nut before you get the feel of it is how people shear it off, and suggests loosening it a little first to feel how it turns. Fender says to take the guitar to a Fender Authorized Dealer if you meet excessive resistance, if the neck needs constant adjustment or if turning the rod has no effect.

Not every truss rod works both ways. A standard single-action rod can only straighten a neck with too much forward bow. It cannot push a back-bowed neck the other way. A dual-action rod can.

Support the Neck

Once the neck is straight, keep it that way while you work. Lay the guitar on a padded surface with a neck rest under the neck near the nut. The neck should be supported but not pushed up. If the rest is too tall it can bend the neck slightly, and you will level that bend into the frets. Check the straightedge again with the guitar sitting on the rest.

Record It

Write these in the Fret Job Record before you go on:

☐ Relief at pitch before work (from Chapter 3)

☐ Direction and amount of truss rod turn to straighten

☐ Straightedge reading, strings off: bass side, middle, treble side

☐ Any twist, hump or fall-away noted

Shop note If the straightedge rocks on one fret or a group of frets now, with the neck straight, that is your leveling job. If it lies flat everywhere and the buzz map still shows trouble, go back to the setup before you take metal off.

Chapter 5: Masking and Taping

Masking takes ten minutes and saves hours of finish repair. Metal dust gets into rosewood grain, abrasive paper scratches a maple board, and a file that slides off the end of the board will gouge whatever it hits. Mask everything you are not working on.

What to Cover

1. **Pickups.** Cover every pickup on an electric with tape or a paper cover taped at the edges. Metal filings stick to pickup magnets and are a chore to get off.
2. **Soundhole.** On an acoustic, plug the soundhole with a cloth or cover it with paper. If the acoustic has a magnetic soundhole pickup, treat it like an electric.
3. **Body at the end of the neck.** The leveling beam and files can run off the end of the fretboard. Tape the body where the neck meets it. StewMac's fret end work tapes this spot and the headstock area for the same reason.
4. **Headstock near the nut.** Tape the area just past the first fret and the face of the nut.
5. **The fretboard.** Cover the wood between the frets.

Masking the Fretboard

There are two common ways to protect the board.

Fretboard guards. These are thin metal or plastic plates with a slot. Slide one over a fret so only the metal shows. StewMac sells thin stainless steel fingerboard guards for this. Guards are the safest choice on a finished maple board and on any nitro or older finish. They work best for crowning and polishing, one fret at a time.

Low-tack tape. Lay painter's tape on the wood between each pair of frets. For leveling, many techs mask the whole board between the frets so the beam can run the full length. Press the tape onto your shirt a few times first to take some of the tack out, so it holds less.

On a bare rosewood or ebony board, de-tacked tape is fine. On a finished maple board, and especially on nitro or a vintage finish, tape can pull up finish. Use guards there, or test the tape in a hidden spot and pull it off slowly.

Taking Tape Off

Pull tape slowly, peeling it back over itself at a low angle. Pulling straight up can lift finish. Vacuum the metal dust off the tape before you peel it, so the dust does not fall into the grain.

> **Caution** Do not put tape on a nitro finish unless you know it is safe on that guitar. If you are not sure whether a guitar is nitro, treat it as if it is.

Chapter 6: Leveling

Leveling brings the tops of all the frets to one even surface, so no fret stands above its neighbors. It is the step that removes the most metal and the one that cannot be undone. Go slowly, and let the marker tell you what is happening.

Before You Start

- ☐ Diagnosis done and recorded (Chapter 3)
- ☐ Neck straight, strings off, supported on a neck rest (Chapter 4)
- ☐ Lifted frets reseated
- ☐ Pickups, soundhole, body, headstock and board masked (Chapter 5)
- ☐ Eye protection on, vacuum at hand

Flat Beam or Radius Block?

The face of a fretboard is curved from side to side. That curve is the **radius**. A 7.25 inch radius is a tight vintage curve, and a 16 inch radius is much flatter. Measure your board's radius with radius gauges before you choose a tool.

Tool	How it works	Good for
Long flat beam	A machined straight bar with abrasive on the bottom. You move it along the neck and slowly roll it across the curve so it follows the radius	Any radius, including compound-radius boards whose curve changes from nut to body
Radius block	A block whose bottom is curved to match one radius	Boards with a single, constant radius that matches the block
Short leveler or fret file	A short flat face used on one fret and its neighbors	Spot leveling one high fret

A radius block is easy to use, but only if it matches the board exactly. On a compound-radius board, the curve gets flatter as you go up the neck, and a single radius block will not fit along its whole length. A long flat beam worked along the string paths handles both.

The Marker Is Your Gauge

Color the top of every fret, end to end, with a fine-point permanent marker. As the beam cuts, it takes the marker off the high spots first. When the marker is gone along the length of a fret, that fret has been touched by the beam. When there is still marker in a divot or on a low fret, the beam has not reached it yet.

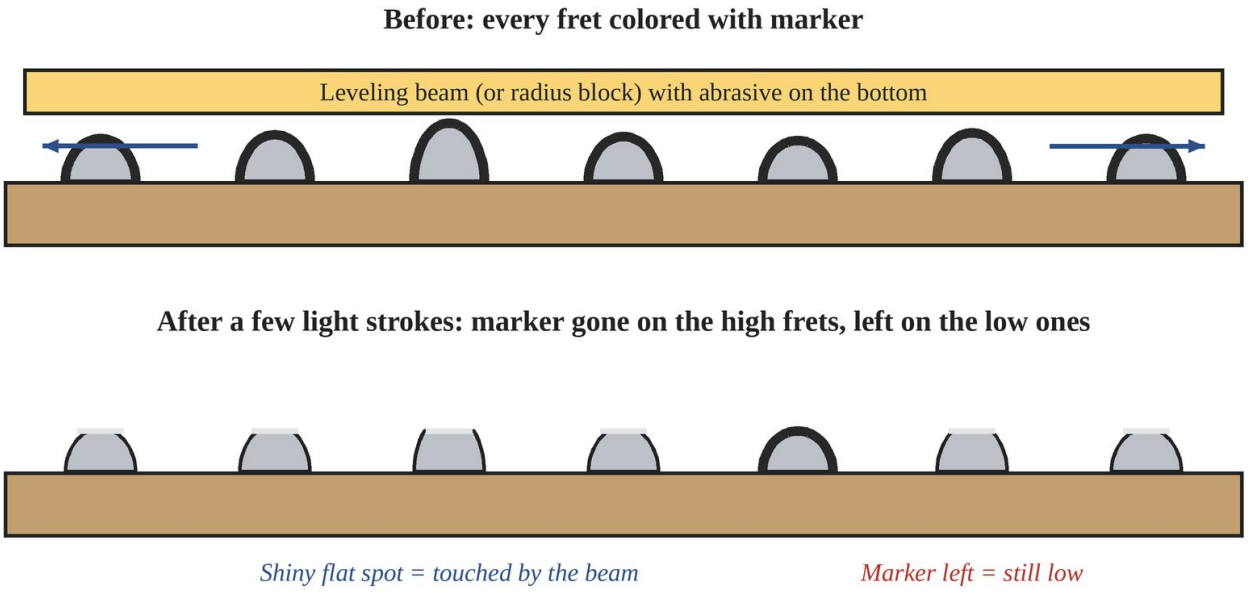


Figure 3. Color every fret, then let the beam show you the high and low spots.

Full Leveling, Step by Step

1. **Color every fret** with the marker. Let it dry.
2. **Set the beam on the frets** with light, even pressure. Let the weight of the beam do most of the work. Pressing hard bends the neck and cuts unevenly.
3. **Make a few long strokes along the length of the neck,** covering as many frets as the beam spans. As you stroke, roll the beam slowly across the board from the bass side to the treble side so it follows the radius. On a radius block, keep the block square to the frets and just stroke along the neck.
4. **Stop after a few strokes and look.** Vacuum the dust and check the marker under a good light. The high frets will show bright flat spots. The low frets will still have marker on them.
5. **Keep going in short sessions,** checking after every few strokes, until every fret shows a thin, even flat spot along its whole length. Check both ends of each fret, not just the middle.
6. **Watch the deepest divots.** A level has to take the frets down to the bottom of the deepest wear, or that fret will still be low. If you have taken several sessions and a few divots are still holding marker while the other frets are getting low, stop. Those frets may be better replaced (Chapter 12).
7. **Check with the rocker and a straightedge.** Run the rocker over every fret under the bass, middle and treble paths. Nothing should rock. Lay the straightedge along the frets. It should touch every fret.

Fall-Away

Some techs take a little more off the frets on the part of the board over the body, so the upper frets "fall away" slightly toward the end of the neck. The idea is to give the strings more room in the area where players bend high on the neck. It is a matter of shop practice and player taste, not a rule. If you are learning, level flat first and leave fall-away until you have done a few guitars.

Spot Leveling One Fret

When the rocker finds only one high fret and the rest of the board is clean, you do not need to level the whole neck.

1. Protect the board with guards or tape on both sides of the high fret.
2. Color the top of the high fret with the marker.
3. Lay a short leveler flat across the high fret, bridging onto the frets on each side if it is long enough, and stroke lightly along the fret. StewMac's method uses the diamond face of its Fret Kisser this way.
4. Check often. Stop as soon as the marker is just gone along the length of the fret.
5. Check again with the rocker. If it still rocks, take a few more light strokes and check again.
6. Recrown and polish that fret (Chapters 7 and 8).

Mistakes to Avoid

- Leveling with the neck bowed. Go back to Chapter 4.
- Pressing hard on the beam. Light pressure, more strokes.
- Working only in the middle of the board and leaving the edges high. Follow the radius out to the edges.
- Chasing one deep divot and taking every other fret down to match it. Sometimes replacing that fret is better.
- Forgetting to check. Look after every few strokes.

Shop note Leveling leaves every fret with a flat top. That is normal, and it is why crowning always follows leveling. Do not restring a guitar with flat-topped frets and call it done.

Chapter 7: Crowning

Leveling leaves a flat on top of every fret. Crowning rounds the fret back into a dome, so the string touches it along a thin line in the middle again. The trick is to round the shoulders of the fret without touching the very top. The top is the height you just leveled, and if you file it away, the fret is no longer level.

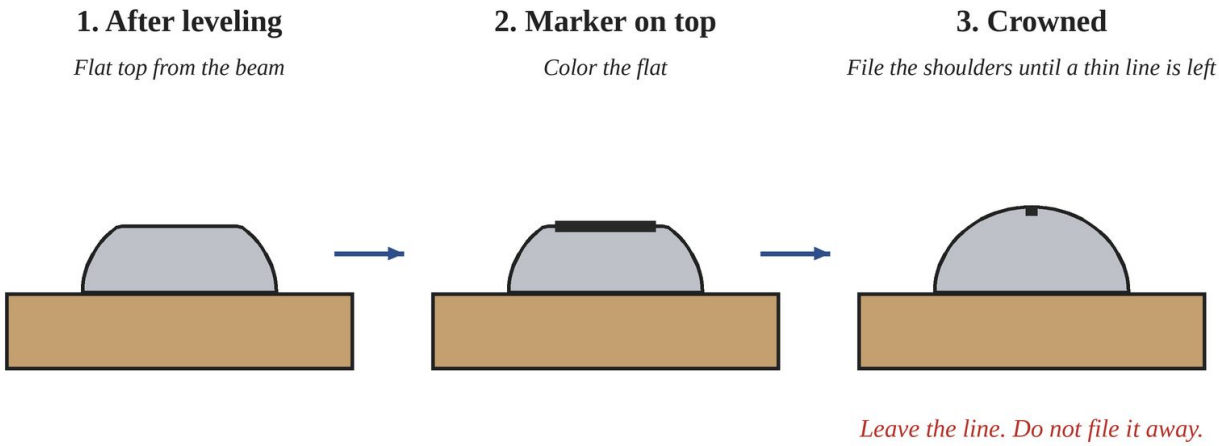


Figure 4. Crowning: color the flat, then file the shoulders until a thin line of marker is left on top.

Crowning Files

A crowning file has a concave cutting face that fits over the fret and rounds both shoulders at once. They come in sizes to match narrow, medium and wide fret wire, and some are double-sided for two sizes. Diamond crowning files cut cleanly and do not clog. Match the file to the width of the fret wire. A file that is too narrow for the fret will cut a groove in the top. One that is too wide will not shape the shoulders.

A three-corner file with safe, smoothed edges is the older tool for the same job. It takes more skill to keep the top of the fret round with it.

Step by Step

1. **Re-mark every fret.** Color the flat tops left by leveling with the marker.
2. **Protect the board.** A fretboard guard over each fret keeps the file off the wood. Crowning is where most fretboard scratches happen.
3. **Set the file on the fret** and work it along the length of the fret in smooth strokes, rocking it slightly from one side to the other so it rounds both shoulders. StewMac's demonstration holds a 300-grit diamond file at about 30 degrees to work the shoulders.
4. **Look at the marker often.** As you file, the flat gets narrower from both sides.

5. **Stop when only a thin line of marker is left** along the very top of the fret, running its full length and centered on the crown. That line is the high point you leveled. Do not file it away.
6. **Check both ends.** Fret ends are easy to miss. The thin line should run all the way out.
7. **Move to the next fret.** Do every fret before you move on to polishing.

Reading the Line

What you see	What it means	What to do
Thin, even line, centered, full length	Crowned correctly	Move on
Line wider at one end	That end is still flat	Work that end only
Line off to one side	Filing more on one side than the other	Even out your strokes
Line gone in spots	You filed into the top	Check that fret with the rocker; a low spot may need the board leveled again
Wide line everywhere	Not crowned yet	Keep going

Mistakes to Avoid

- Crowning before every fret is level. The marker line will mean nothing.
- Pressing down hard. The file should cut the shoulders, not the top.
- Using a file sized for a different fret wire.
- Letting the file touch the board. Use guards.

Shop note A good crown makes the guitar sound clearer and play in tune better, because the string stops at one exact point on each fret. It is worth the time it takes.

Chapter 8: Polishing

Crowning leaves file marks on every fret. Polishing takes those marks out and leaves a smooth, bright surface that strings slide across. Smooth frets make bends feel easy and keep strings from catching. This is also the step players notice most when they pick the guitar back up.

What to Polish With

Polishing works in steps, from coarser to finer, until the frets shine. Each step removes the scratches left by the one before. Choose one of these systems and stick with it.

Abrasive	Notes
Fret erasers	Rubber blocks with grit inside. StewMac sells them in seven grits from 220 to 8000. They do not shed sharp particles the way steel wool does
Micro-mesh pads or polishing papers	Cushioned abrasive sheets. StewMac's fret end method goes through about 1,500, 3,600 and 8,000 grit
Fine synthetic pads	Non-metal pads that do not leave fibers for the magnets to grab
Fret polish	A fine compound on a cloth for the final shine
0000 steel wool	Acoustics with no magnetic pickup only, soundhole covered. Never on an electric

Step by Step

1. **Keep the board protected.** Leave the guards or tape in place.
2. **Start with the grit that removes your file marks.** After a diamond crowning file, that is usually the coarsest step of your system.
3. **Rub along the length of each fret** with light pressure, following the curve of the crown. Work the top and both shoulders. Do not press hard enough to flatten the crown you just made.
4. **Wipe and vacuum the dust** before you move to the next grit. Grit carried from a coarse step scratches the fret on the fine step.
5. **Step up through finer grits** until the scratches are gone and the frets shine under a light.
6. **Finish with fret polish** on a soft cloth if you want a mirror shine.
7. **Clean up completely.** Vacuum the metal dust off the tape before you peel it. Then remove the tape slowly, at a low angle.
8. **Clean the board.** Wipe any polish residue off the wood. Condition a bare rosewood or ebony board with a fretboard oil made for guitars. Do not oil a finished maple board.

Check Your Polish

Look down each fret with a bright light at a low angle. File marks show up as fine lines across the crown. If you can still see them, go back one grit on that fret. Run a fingernail along the top. It should glide without catching.

A Note on Steel Wool

Steel wool is the old way to polish frets, and some big makers still mention it for acoustic guitars. It works, but it sheds steel fibers. On an electric, those fibers end up on the pickup magnets and in the pots. My rule is simple: never on an electric. On an acoustic with no magnetic pickup, use only 0000 grade, cover the soundhole, rub along the length of the board, and vacuum every fiber before you remove the covers. A magnet wrapped in tape will pick up the strays. Use it at your own discretion and with extreme care.

Caution Light pressure only. Heavy sanding with coarse grits changes the height of a fret and undoes the leveling. Power buffers can groove frets and burn a finish.

Chapter 9: Fret End Dressing and Fret Sprout

Fret ends are where a player's hand meets the frets every time it slides along the neck. Sharp, square or sprouted ends make a neck feel cheap no matter how good the frets play. Dressing the ends is part of every full fret job, and it is also the most common fret fix on its own in a dry climate like ours in Northern Nevada.

What Fret Sprout Is

Wood shrinks when it dries out. Metal does not. When the air gets dry, the fretboard gets a little narrower across the grain, but the frets stay the same length, so their ends stick out past the edge of the board. Players feel it as sharp little points along the edge of the neck. In the high desert it shows up most in winter when the heater runs, but it can happen any time the air is dry.

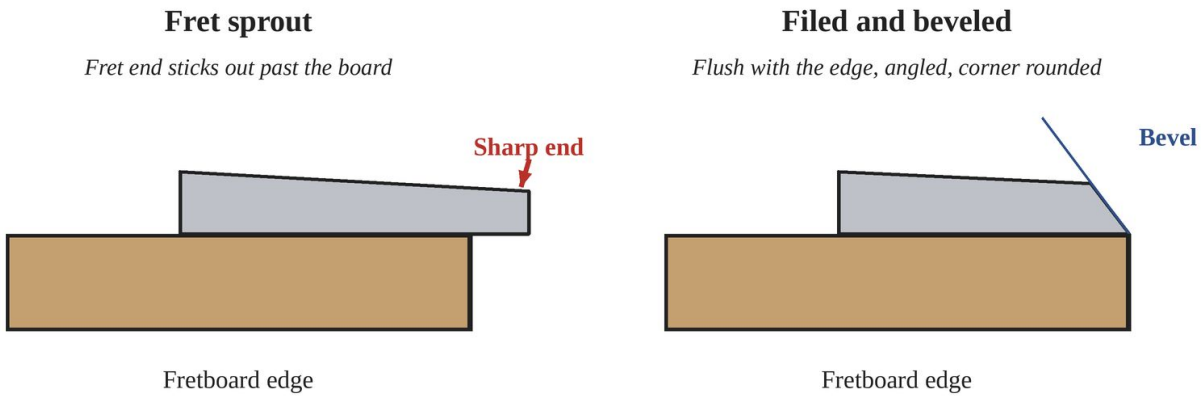


Figure 5. Fret ends seen from the end of the neck: sprouted, then filed flush and beveled.

Fix the Humidity First

Before you touch a file, get the guitar back to a healthy humidity. My book *Guitar Care and Maintenance* recommends aiming for 45 to 50 percent relative humidity, with anything from 40 to 55 percent being fine, and Chapter 7 of that book covers how to get there. Give the guitar a week or two at a steady humidity. Mild sprout often shrinks back on its own once the wood takes up moisture again. StewMac gives the same advice: re-humidify to roughly 40 to 50 percent before you file, because mild sprout sometimes recedes, though severe sprout will still need dressing.

If you file the ends in the dead of winter at very low humidity, the board can swell back in spring and leave the fret ends short of the edge. That is why humidity comes first. If the ends are still sharp after the guitar has settled, file them.

When to Stop and Send It Out

- The neck has binding (a plastic or wood strip along the edge of the fretboard). Bound necks need different tools and techniques, and a file tears up binding fast.
- The finish is cracked or lifting around the fret ends.
- A fret end is loose or lifting out of its slot.

The Bevel Angle

Fret ends are filed at an angle, called the bevel, so the hand does not catch on them. Makers and tool sellers do not agree on one angle. StewMac's beveling file is set at 35 degrees, and its fret end guide says bevels typically run about 35 to 45 degrees and warns against going shallower than about 30. The more you angle the bevel, the narrower the playing surface gets for the outer strings, and the easier it is for the high and low E strings to slip off the edge.

For sprout on a guitar that was fine before, you are only bringing the ends back to the bevel the factory already cut. Match it. A fixed-angle beveling file makes that easy.

Filing the Ends Flush

1. Take the strings off, or loosen them and slide them off the edges of the board.
2. Put the guitar on a neck rest.
3. Tape the body where the neck meets it and the headstock near the first fret. Cover the pickups or plug the soundhole.
4. Hold the file flat against the edge of the fretboard at your bevel angle. Push it along the length of the neck in long, light strokes. Let the file ride the fret ends, not the wood.
5. Listen and feel. When the file stops cutting metal and starts touching the board or finish, the sound changes. Stop on that side.
6. Do the other side.
7. Run your hand along both edges. If a fret end still catches, give that area a few light strokes.

Rounding the Corners

Filing leaves a flat, square corner on top of each fret end. That corner is what still catches the hand on a fast slide. A fret end dressing file has smooth, safe edges so it can round the end without cutting into the board.

1. Use the flat side to ease the sharp corner at the top of each end.
2. Use the rounded side to roll the top of the fret end into a smooth dome that blends into the crown.
3. Work both ends of every fret. A few light strokes per end is plenty.

Polish and Clean Up

Polish the ends with the same abrasives you used on the crowns (Chapter 8). Vacuum every bit of metal dust, pull the tape slowly, clean the board, and oil it if it is bare wood.

Will It Come Back?

It might. Sprout can return after the next dry season, especially on a newer guitar, and often settles down after a few seasons as the wood stabilizes. If it keeps coming back badly, that guitar is living in air that is too dry. Fix the air, not the frets.

Chapter 10: Checking Your Work and the Final Setup

A fret job is not finished when the last fret is polished. It is finished when the guitar is strung, set up and every note plays clean. This chapter is the check I run before a guitar leaves the bench.

Check the Frets Bare

Before the strings go on, with the tape off and the board clean:

1. Run the fret rocker over every fret under the bass, middle and treble paths. Nothing should rock.
2. Lay a straightedge along the frets in three places. It should touch every fret.
3. Look down each fret under a bright light for file marks, flat spots or a missed divot.
4. Run your hand along both edges of the neck. No fret end should catch.
5. Check for metal dust in the pickups, pots, soundhole and around the tuners. Clean it now.

String Up and Set Up

Leveling changes fret heights a little, so the old setup no longer fits. Do a full setup in this order, because each step affects the ones after it.

1. **Relief.** Return the truss rod toward its playing setting and set relief (Chapter 3 has the check and Fender's starting numbers).
2. **Action.** Set string height at the bridge or saddle. Fender measures electric action at the 17th fret and lists 4/64 inch (about 1.6 mm) on both the bass and treble sides as a starting point for 9.5 to 12 inch radius necks.
3. **Nut.** Check the nut slots. The frets are now slightly lower, so a nut that was right before may now be a little high.
4. **Intonation.** Set the saddles so the 12th fret note matches the 12th fret harmonic.
5. **Pickup height** on an electric.

The Play Test

Now make a new buzz map with the same table you used in Chapter 3. Tune to pitch, and play every string at every fret with normal force. Then bend notes on the plain strings in the middle and upper part of the neck. Write the results next to the "before" map.

What the after map shows	What to check
Clean everywhere	Done. Record the final numbers
Buzz on low frets only	Relief too low; add a little
Buzz everywhere in the middle	Action too low or relief too low
One note buzzes	Rocker test the fret above it again
Bends choke high on the neck	Check the upper frets with the rocker; consider a touch of fall-away
Open strings buzz	Nut slots now too low compared to frets, or were before

Record the Results

Fill in the "after" section of the Fret Job Record: relief, action at the bass and treble, the after buzz map, and any notes for the next visit. When the guitar comes back in a year or two, those numbers tell you how it has held up and how much fret height is left for the next job.

> **Shop note** Let the guitar sit overnight at pitch and check relief again the next day. Necks keep moving for a while after the strings go back on.

Chapter 11: Notes for Acoustics, Basses and Other Necks

The procedure in Chapters 3 through 10 works on any steel-string guitar. A few kinds of instruments need extra care, and this chapter covers the ones that come across my bench most often.

Steel-String Acoustics

- **Check the guitar's health first.** A dry acoustic can show low action, a sunken top and sharp fret ends, and Taylor lists all three as signs of a dry guitar. A wet one can show high action and a bulging top. Get the humidity right and let the guitar settle for a week or two before you diagnose anything.
- **Look at the fingerboard extension.** Lay a straightedge on the frets from the middle of the neck out over the body. If it rocks or the frets over the body stand high, the extension may be rising. That changes the leveling job, and sometimes the guitar needs more than fret work.
- **Truss rod access.** On many acoustics the truss rod nut is inside the soundhole at the base of the neck. Use the right wrench and a light, and watch that the wrench does not scratch the top or the brace near the nut.
- **Protect the top.** The top of an acoustic is thin and easy to dent or scratch. Tape the top where the fretboard meets it, and keep the beam and files from running off the end of the board onto the top.
- **Cover the soundhole.** Metal dust inside an acoustic is hard to get out and can end up on an undersaddle pickup's wiring.
- **Check the warranty.** Some makers want truss rod and fret work done at an authorized service center. Martin's care guide says truss rod, saddle and nut adjustments and all repairs belong with an Authorized Service Center. Check before you work on a guitar that is still under warranty.

Basses

Bass frets wear like guitar frets, only bigger. Roundwound bass strings are rough on frets, and the low frets under the E and A strings often show wide, flat grooves. The procedure is the same, with a longer beam for the longer neck. Basses usually carry more string tension, so let the neck settle longer after each truss rod turn and after the strings go back on.

Classical and Nylon-String Guitars

Classical guitars usually have a flat or nearly flat fretboard, often with no truss rod. Without a truss rod, you cannot set the neck straight before leveling, so the leveling job has to work with the neck as it is. Nylon strings wear frets much more slowly than steel, and many classical guitars

need little more than a polish over many years. Most have bare boards, so guards and polish work well.

Scalloped and Unusual Boards

A scalloped board has wood carved away between the frets, so the fingertip never touches the board. Masking the curved wood is fiddly, and guards do not sit flat. Take extra time with tape, and keep files and beams square to the fret.

Fanned-fret guitars have frets set at angles. A long flat beam still works, but radius blocks and some fixtures may not. Seven- and eight-string necks are wider, so use a beam long and wide enough to span them, and follow the radius out to both edges.

Guitars With Finished Maple Boards

A finished maple board has a clear coat over the wood and around each fret. Abrasives and files scratch that finish easily, and tape can lift it. Use fretboard guards for every step you can, and be extra careful at the ends of each fret where the finish is thin. Never oil a finished maple board.

Guitars With Binding

On a bound neck, the fret ends sit over or between the binding. The binding can be cut or scratched by files, and the fret ends are often shaped to fit around a small lip of binding. Leveling and crowning are the same as on any neck. Fret end work on a bound neck should go to a shop (Chapter 14).

Chapter 12: Partial Refret or Full Refret

Every set of frets runs out of metal sooner or later. When a level would take the frets too low, or a few frets are worn far deeper than the rest, the answer is new frets. A refret is a shop job. I include this chapter so you know what is involved and can make a good decision with your repair person.

Signs It Is Time

- Divots so deep that leveling to the bottom of them would leave every fret too low.
- Frets that have already been leveled once or twice and are now low and flat.
- Several loose or lifting frets.
- A player who wants a different fret size or material.
- A fretboard that needs planing, such as a hump or a twist that the frets alone cannot fix.

There is no single height cutoff, because fret wire starts out at so many heights. Measure what is left (Chapter 3) and compare it with what the player wants under their fingers. Some players like low frets. Others want tall frets for bending and will not be happy with low ones, even if they still play clean.

Partial Refret

A partial refret replaces only the worn frets, usually a group of low frets near the nut, where most of the wear happens. The new frets are installed and then leveled to match the old frets above them. Then the whole board is crowned and polished.

A partial refret makes sense when:

- The wear is concentrated on a few low frets.
- The upper frets still have plenty of height.
- Matching fret wire is available, so the new frets feel the same as the old.

It makes less sense when the upper frets are already low, or when the matching wire cannot be found. In that case, the new frets will be taller or a different shape, and the player will feel the change.

Full Refret

A full refret replaces every fret. The old frets are pulled with special pliers, usually after heating them to soften the glue or the wood around the tang, so the slot edges do not chip. The slots are cleaned, the board is checked and often planed true, new fret wire is cut, radiused and installed, the ends are trimmed and beveled, and then the new frets are leveled, crowned and polished like any other fret job.

Special Cases

- **Finished maple boards.** The finish on a maple board often chips when frets come out, and the board may need to be refinished. Ask about this before the job starts.
- **Bound necks.** The fret ends are trimmed to fit over or between the binding. It takes extra time and care.
- **Vintage and collectible guitars.** Original frets are part of the value of some guitars. A partial level or a careful partial refret may be better for the guitar's value than a full refret. Talk it through with someone who knows that model.
- **Acoustics with a rising fingerboard extension.** The frets over the body may need to come down more than the rest, and the extension itself may need attention.

Questions to Ask a Shop

- ☐ What fret wire will you use? What are its actual width and height?
- ☐ Nickel silver, stainless or a gold-colored alloy?
- ☐ Will the board be planed or have its radius changed?
- ☐ Will the finish on a maple board need repair?
- ☐ Does the price include a full setup after?
- ☐ How long will it take, and how will the guitar be stored while it is there?

Chapter 13: Fret Wire: Nickel Silver, Stainless and Gold Alloys

When a guitar gets a refret, the player gets to choose the wire. That choice changes how the neck feels and how long the next set of frets will last. This chapter gives the published sizes and materials so the choice is an informed one.

How Sizes Are Named

Fret wire is described by two crown measurements: width and height. Height is the one players feel most. It decides how far a fingertip pushes the string before it touches the fret, and whether the fingertip touches the wood at all.

Makers do not write the two numbers in the same order. Fender gives width first, then height. Jescar's part numbers do the opposite and encode height first. Jescar's 57110 is .057 inch high and .110 inch wide. Dunlop uses four-digit numbers like 6105 and 6100 that do not encode size at all.

Published sizes are for new wire. As Chapter 1 noted, StewMac says frets lose about .004 to .010 inch of height during installation and leveling, so a finished fret measures a bit less than the catalog number.

Common Sizes

These are the common wires, with sizes as published by Dunlop and Fender and the closest Jescar size. Sources do not fully agree, and Fender itself says sizes can vary slightly from one lot of wire to the next. Ask your shop for the actual size of the wire they will use, not just a name.

Common name	Dunlop number	Width x height (inch)	Closest Jescar size
Fender vintage	6190	.084 x .039 (Fender)	None listed
Vintage small	6230	.078 to .079 x .043	43080
Narrow tall	6105	.090 to .094 x .054 to .059	55090
Medium jumbo	6150	.100 to .103 x .042 to .046	47104
Vintage wide and low	6130	.106 x .036	39106
Jumbo	6100	.110 x .055	57110
Super jumbo	6000	.118 x .058	58118

The narrow tall 6105 shows how far the sources can disagree. Its height runs from .047 to .059 inch depending on whose chart you read (Warmoth lists the low end). That is a real difference under a fingertip.

How Size Feels

Tall frets let a fingertip push the string down without touching the wood. Fender says jumbo wire can make bending easier because it takes less pressure. The trade-off is that a heavy grip can push the string sharp, because the string gets stretched farther toward the wood. Low, wide frets put the string close to the board. Fender says the lower frets suit players who like to feel the fretboard under their fingers. Fender also calls fret size purely a matter of preference, and I agree. Players should try a few guitars with different wire before they choose.

Materials

Material	What the sources say	Upkeep
Nickel silver, 18 percent	The standard on most electric guitars. Copper, nickel and zinc, with no silver in it. Warmoth lists its nickel silver at a hardness of HV 170	Wears fastest, tarnishes, easy to level and crown
Stainless steel	Warmoth lists the Jescar stainless it uses at HV 300, plus or minus 20. StewMac says stainless is slow to wear or develop grooves	Lasts much longer between levelings, but takes longer to level, and it is hard on files
Gold-colored alloys (Jescar EVO, StewMac Gold)	Nickel-free, which matters to players with a nickel allergy. StewMac says its Gold wire is harder than nickel silver and similar to Jescar EVO	Wears slower than nickel silver; no published number against stainless

HV is Vickers hardness, a lab measure in which a higher number means a harder metal. By Warmoth's figures, its stainless is roughly 1.75 times as hard as its nickel silver.

Stainless or Nickel Silver?

Here is how I lay it out for players who ask.

Stainless makes sense for a guitar that gets played hard every day, for players who bend a lot and wear frets quickly, and for anyone who never wants to polish frets again. It stays bright. It costs more in shop time, because it is hard to cut, level and crown. Luthier Paul Hostetter warns that stainless wears out ordinary tools quickly, and that cost shows up in the price.

Nickel silver makes sense for vintage guitars, for players who want a traditional feel, and for guitars that do not get heavy use. It is easier and cheaper to level later.

Gold alloys sit between them and are the answer for players with a nickel allergy.

Does Material Change the Tone?

Warmoth says it finds no discernible tone difference between its nickel silver and stainless frets. StewMac says some players hear a slightly brighter tone from stainless. Neither gives a measurement. If there is a difference, it is small, and it is far behind pickups, setup and amplifier in what a player hears. My book *Chasing Tone* looks at the listening side of claims like this.

Chapter 14: When to Send It Out

Knowing when to stop is a skill. I would rather a player bring me a guitar before they start than after a file slipped. None of these is a failure. They are the jobs where the right tools, a neck jig or a lot of practice make the difference.

Send It Out When

- The neck has a twist, a hump or a ski jump that the truss rod will not take out.
- The truss rod is stiff, frozen, maxed out or has no effect.
- Frets are lifted, loose or clicking, especially more than one.
- The neck is bound and the fret ends need work.
- The finish is cracking or lifting around the fret ends.
- The divots are deeper than a level can safely remove.
- The guitar needs a partial or full refret.
- The guitar has stainless frets and you do not have tools made to cut them.
- The guitar is vintage, valuable, or has a nitro finish you are not sure about.
- The guitar is an acoustic with a rising fingerboard extension, a sunken top or a lifting bridge.
- You have never leveled frets and this is a guitar you care about. Practice on an inexpensive guitar first.

What a Good Fret Job Includes

When you pay for a level and crown, ask what is included. A complete job usually covers:

☐ Diagnosis and a buzz map before work

☐ Neck set straight and supported before leveling

☐ Leveling, crowning and polishing every fret

☐ Fret ends dressed

☐ Fretboard cleaned and, if bare, conditioned

☐ A full setup after: relief, action, nut check, intonation and pickup height

☐ A play test of every note

Practice First

If you want to learn this work, buy an inexpensive used guitar with worn frets and do the whole procedure on it, start to finish. Then do it again. The first level and crown teaches you more than any book can, and it is much better to learn on a guitar that nobody will miss.

A Last Word

Good fret work is mostly patience. Check the neck before you start, mark every fret, take off a little at a time, and look after every few strokes. Do the job in order and the frets will tell you what they need.

Fret Job Record

Copy these pages for each guitar. Keep the record with the guitar or in your shop file.

Guitar	
Make and model	
Serial number	
Owner	
Date in	
Fretboard wood and finish	
Fretboard radius	
Fret wire and material, if known	
Bound neck? Nitro finish?	
Room humidity when checked	
Owner’s complaint	

Before Work

Measurement	Reading	Notes
Relief at 8th fret, capo at 1st, at pitch		
Action at 12th or 17th fret, bass side		
Action at 12th or 17th fret, treble side		
Fret height, least-worn fret		
Fret height, worst-worn fret		
High frets found (rocker)		
Lifted or loose frets		
Sprouted fret ends		

Buzz Map

Mark B for buzz and C for a note that chokes or dies. Use one map before work and one after.

Fret	Low E	A	D	G	B	High E
Open						
1						
2						
3						
4						
5						
6						

Fret	Low E	A	D	G	B	High E
7						
8						
9						
10						
11						
12						
13 to 16						
17 to 20						
21 to 24						

Neck Set for Leveling

Item	Reading
Truss rod turned (direction and amount)	
Straightedge, strings off, bass side	
Straightedge, strings off, middle	
Straightedge, strings off, treble side	
Twist, hump or fall-away noted	

Work Done

☐ Lifted frets reseated

☐ Spot level (frets: _____)

☐ Full level

☐ Crowned

☐ Polished

☐ Fret ends dressed

☐ Board cleaned and conditioned

☐ Partial refret (frets: _____) or full refret

After Work

Measurement	Reading	Notes
Relief at 8th fret, at pitch		
Relief rechecked next day		
Action, bass side		
Action, treble side		
Nut slots checked		
Intonation set		
Pickup height set		
After buzz map clean?		

_____

_____

_____

_____

Final Check

- ☐ Diagnosis done, with a buzz map, rocker test and relief check
- ☐ Easy causes ruled out: humidity, nut, setup, loose parts
- ☐ Neck straight and supported before leveling
- ☐ Lifted frets reseated before leveling
- ☐ Pickups, soundhole, body, headstock and board masked
- ☐ Every fret colored, leveled until every fret shows a flat spot
- ☐ Rocker and straightedge clean after leveling
- ☐ Every fret crowned to a thin, centered line
- ☐ Every fret polished, no file marks
- ☐ Fret ends flush, beveled and rounded
- ☐ All metal dust cleaned up, tape removed slowly
- ☐ Full setup: relief, action, nut, intonation, pickup height
- ☐ Every note played, bends checked, after buzz map clean
- ☐ Numbers recorded

Glossary

Action. The height of the strings above the frets.

Back bow. A neck bent backward, away from the strings.

Bevel. The angle filed on the ends of the frets.

Binding. A plastic or wood strip along the edge of a fretboard or body.

Compound radius. A fretboard whose curve gets flatter from the nut toward the body.

Crown. The rounded top of a fret. Also the job of rounding it after leveling.

Divot. A dent worn into a fret by a string.

Fall-away. Taking the upper frets slightly lower toward the end of the neck.

Fret dress. Leveling, crowning and polishing the frets.

Fret rocker. A short straightedge that spans three frets to find a high one.

Fret sprout. Fret ends that stick out past the edge of a dried-out fretboard.

Neck jig. A shop fixture that holds a neck in its strung-up shape with the strings off.

Nickel silver. The usual fret alloy of copper, nickel and zinc.

Radius. The side-to-side curve of the fretboard.

Refret. Replacing old frets with new wire.

Relief. The slight forward bow in a neck under string tension.

Tang. The barbed leg of a fret that holds it in its slot.

Truss rod. An adjustable steel rod inside the neck that counters string pull.

Acronyms

HV. Vickers hardness

PRS. PRS Guitars (Paul Reed Smith)

Sources

The pages below were read for my books *Guitar Care and Maintenance* and *Inside the Electric Guitar* in October and November 2026, and the numbers in this guide come from them. Web addresses change; if one stops working, search the site for the title.

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- StewMac, Fix Fret Buzz with the Strings On (Fret Kisser, recrowning with a 300-grit diamond file).
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- Premier Guitar (John LeVan), Guitar Shop 101: Squeezing More Life Out of Worn Frets.
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About This Book

Fret Work, Step by Step is a Trinfinity Guitar Shop Guide from Trinfinity Enterprises in Dayton, Nevada, alongside *Guitar Care and Maintenance*, *Inside the Electric Guitar*, *Chasing Tone* and the other shop guides. It follows the shop procedure format: check first, set the neck, mask, level, crown, polish, dress the ends, check the work, and record the numbers. Every number comes from a guitar maker or supplier named in the text. Makers revise their guidance, so check your own guitar's maker for its current numbers. If you find something that has changed or needs correcting, please write to andrew@trinfinityenterprises.com.