

# Setting up your Guitar To Professional Standards



By, Ron Kirn

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By  
Ron Kirn

Everything you need to know to  
Set up you guitar  
The way  
you have always wanted

A "How To" manual

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## About this Book

There are many publications available with great instructions regarding the guitar setup. The one problem I have detected in most of them is, they assume you either have a complete luther's shop with \$50,000.00 worth of tools, or are predisposed to spend thousands on specialized tools to use once. This is not at all realistic for an amateur that simply wants to adjust his guitar to a point where it is actually as playable as the professional's guitar.

I offer this, so that anyone with a fundamental understanding of basic hand tools and a "do it yourself" aptitude can do the same setup your favorite guitarist pays way too much for.

Discussed here are my experiences as I have constructed several solid body guitars and then moved on to the setup.. As I'm writing this, I am constructing several more. Therefore there may be some miscellaneous ramblings occasionally as I make new discoveries. Some topics are not discussed in detail because they are explained quite adequately in the web sites listed. Please check them out before writing and ragging on me.

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The Fender Stratocaster®

# Chapter One

## What Gives?

The setup is a rather mysterious aspect of Guitardom. Few realize that a good one is precisely what makes one guitar feel and play remarkably, while another identical guitar will be awful.

Many have been unpleasantly surprised when after playing a great guitar at the local Music Store, you go for it, and find that the one you played is the store's demonstrator and not available, but they have a new, "still in the box" you can have now. You get it home only to find it is barely playable, and the instructions on preparation are minimal at best.

Some are in constant quest of setup perfection. Constantly fooling with, adjusting, tuning, and re-tuning a guitar. It can be frustrating, particularly if you do not know exactly what the little screws are designed to do. Many simply have no idea what those adjustments are supposed to do. Then to further exacerbate the situation some "good friends" that routinely fool around with their guitar thinking they're doing a setup, but in reality, are just screwing it up, will volunteer to do yours. Ya gotta watch out with those guys. I hope this little publication will help you determine who can help and who to run away from, or better yet, how to do it yourself.

The complete initial setup is comprised of several different operations performed on a guitar. The first is a fret leveling which includes a crowning. I know, you have a brand new Whatever, and you paid the 25 bux to the Mega Guitar Store for their setup, so you sure don't need a fret leveling. Ha. . . ignorance is bliss. Yes you do. More as to why later.

Next will come getting the nut cut correctly, and again, it's a virtual certainty yours is not cut correctly.

After you have the nut and frets done, we move on to the truss rod, bridge height and then the individual saddles.

Now with the above taken care of, the fingerboard should feel about right, but you aren't gonna be able to play 'er quite yet. You will have to get the intonation right. After that it's back to the fingerboard, then string action, pickup height, and a few other things I can't recall at the moment.

All of the above is why a real setup, and REAL is the key word here, will cost you about 200 bux, done right.

WHAT!!! 200 BUX!! Yeah I hear you, you are wondering exactly what they did at the guitar factory, here's the answer. . . Nuthin'

Well that could be considered unkind, but it comes close on most guitars sold today. See, here's why.

A large manufacturer is concerned with a major problem while the guitar is being made. That is, cost of production. The cost of the people that assemble the guitar during manufacture is far more than the sum of the parts. Now, couple that thought with what most new guitar owners will do to the guitar once they get their new pride home. Yep, just like you did, they will disassemble the thing to see what they bought. In most cases that little exploratory endeavor ruined whatever attempt at a setup was performed at the factory.

Therefore, over the years we have seen a quality setup disappear from the manufacturing process.

Consider this, when was the last time you bought anything and didn't have to finish assembling it after you opened the box? By dropping a few assembly procedures from the manufacturing, those employees that were doing that job, their parking spaces, benefits, shop Stewards, and break room can all be eliminated, and those expenses drop to the bottom line in black numbers. That's why you now have the responsibility of the setup when you walk out of the guitar store with your new axe.

Now in all fairness, this applies to most of the "off the rack" guitars. Those produced in the "Custom Shops" typically will include the 200 dollar setup. I mean, like what do you expect on a \$4000.00 guitar? More on the cost of making the thing later.

So let's get to it. First, a warning. If you are a world class dork in the workshop, if you don't have a clue as to how to "do it yourself" while repairing simple gizmos around the house, if your mechanical/tool aptitude centers around the mastery of a set of fingernail clip-pers, run, do not walk, away from this project. The reason, you do not know what your are doing, you have not displayed the aptitude to learn what I am talking about, and if you proceed, you will convert a perfectly good guitar into an unplayable ornament to be hung on a wall.

Ok, did you get that? If that offended you...I'm sorry. I just want you to think about your abilities before you jump in. I am a trained profess. . . oops... If you know exactly what I mean, and have had a good laugh watching the "Tool Challenged" try to figure out which end of a hammer to smash the thumb with, you may proceed. This is going to be fun.







# Chapter Two

## Whatcha gonna Need

Ok, to do any job it's going to require tools. Some I can explain how to make, and some you will have to buy, Get over it...that's just the way it is.

You will need basic tools to remove the neck from the guitar, assuming you are working on a bolt on type. If it's a neck through, you may skip tool number 1.

A Phillips head screwdriver, a set of Allen wrenches, probably metric and SAE because no body seems to know what standard we are on yet. These are available in any good hardware department. I do recommend new tools because the crisp edges will reduce the possibility of slipping and gouging a giant gash across your guitar.

You will need a Fret crowning file. You will not be able to "Jerry rig" some gizmo to do the crowning job, so get with it, and buy the thing. They are available at Stewart Mc Donald's [stewmac.com](http://stewmac.com) or Allparts, [allparts.com](http://allparts.com).



They come in sizes. A medium will do most guitars, but if you are doing a Gibson with their Jumbo Frets, you will need one for Jumbo Frets. I bet you figured that one out already.

Some 320 grit wet or dry (you will be using it dry) and some thing like a 1000 grit. Just get whatever is close, this is not Rocket science.

You will have to make the leveling tool. Well you can buy one but why? To make it you will need any good rigid material. That's FLAT... FLAT.... That's F . . . L . . . A . . T material, Oh, that's R . . I . . G . . I . . D too. I use Corian. It is a synthetic material developed by Du-Pont for Kitchen countertops. It is superb. It comes in ½ inch thick sheets 30 inches by 144 inches and costs about \$700.00 a sheet. What? You don't want to plop down 700 bux... well try this.....



Here's one I made, nothing fancy

Look in the Yellow Pages... they are the... Oh you know.....I mean you know tools so you sure know the Yello\*... where was I.... Look under Kitchen Countertops... Find one that fabricates Corian. Call 'em and ask them how much for a few hunks of scrap. Go buy it.

Now don't pay any real money for this stuff, these guys make counters all day, they have warehouses full of scrap which is pretty much useless, because the colors are matched by dye lot, so if they do a Sandstone top, and later need to match it, they cannot order a new sheet because the shade will be slightly different. So they are always looking for something to do with the scrap because it's too good to throw away. Ask about Sink cutouts, there about 18 inches by something like 30 inches and are rough. They are also useless to the Countertop Fabricator.

OK Cut a strip of Corian or whatever you will be using about 2 inches wide by 20 inches long. OH, just normal Carbide tipped woodworking tools will work. Lightly sand it to remove any irregularities, and ease the edges. Take some 3M 77 Spray adhesive and give it a squirt. Take 2 strips of the 320 grit or thereabouts, and press it into the adhesive. Let it sit long enough for the adhesive to dry. Bingo, you now have a fret leveling board and saved about 150 bux.

Other things you may want to have handy is a clean brush for removing the filings from the fingerboard, compressed air works here too. A little WD 40 for final treatment of the rosewood fingerboard is good too.

A Few of those green Scotch Brite pads are handy too, I'll tell ya why later. And a good straight edge long enough to reach the first and last frets.



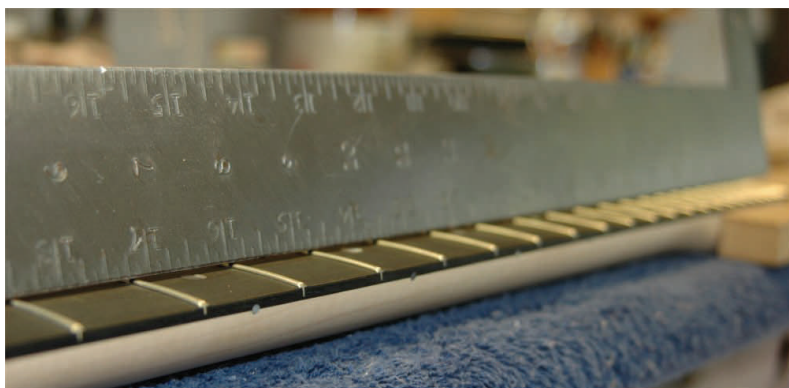


# Chapter Three

Enough BS, Lets doit.

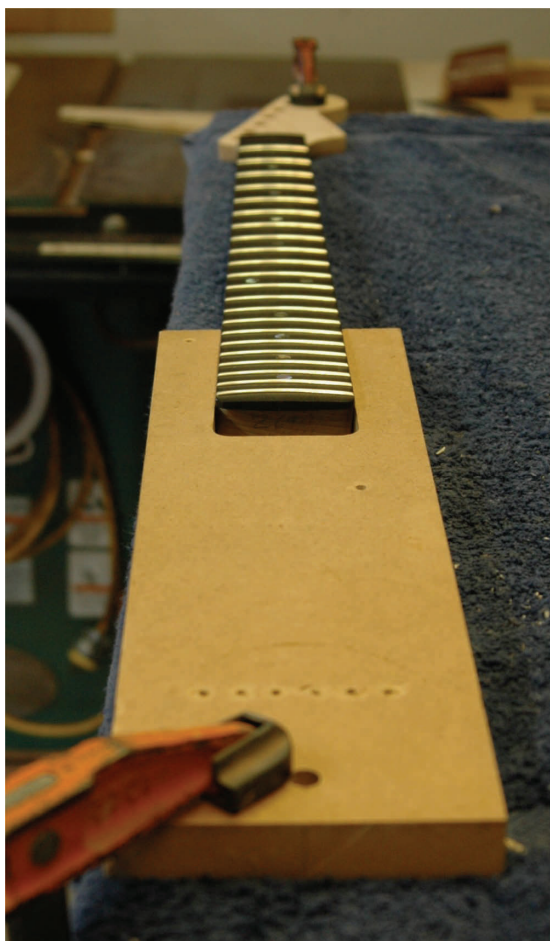
OK remove the strings. Then remove the neck...  
Stop!!! Remove the neck if it's removable, Phew.. I  
could hear the Poulan's being cranked.

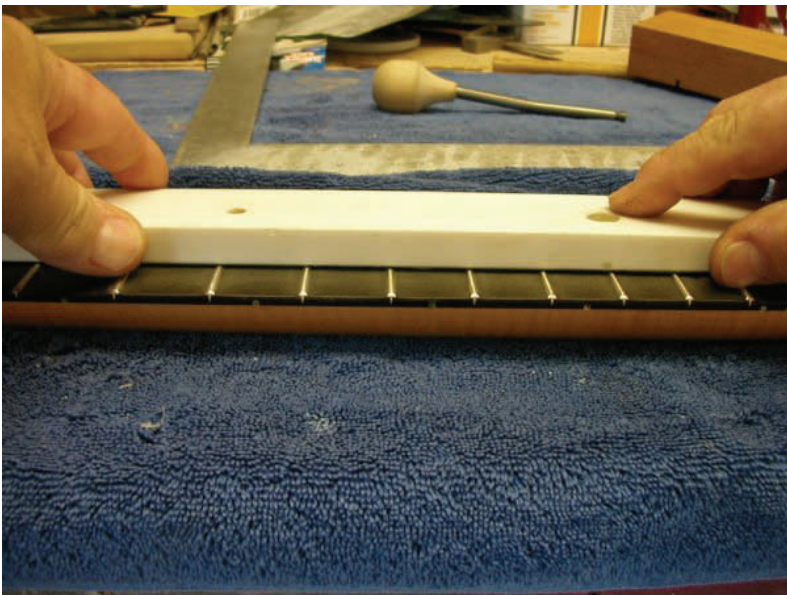
Take the straight edge, and check to see how level  
the neck is. It won't be. It never is. There will be some  
frets higher or lower than the rest. Adjust the truss rod  
until the neck is as flat as you can get it.



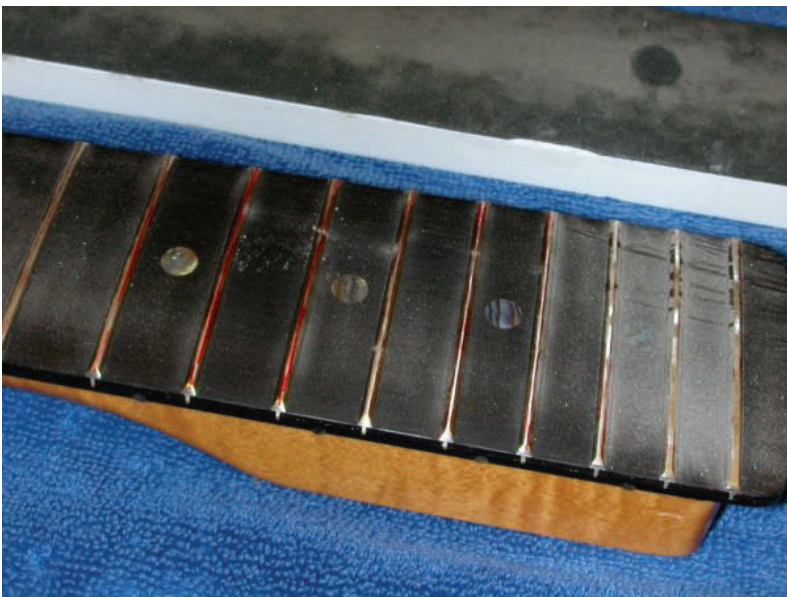
Note: If you have an older neck or one with a conventional truss rod, it will only correct a concave bow. If you neck has a convex, or a bowed back shape when the truss rod is loosened, you're screwed. If your guitar came with a dual action truss rod, it can correct a bow in either direction. So adjust away.

Now the neck must be clamped to some degree. And don't forget the pads under the clamps.. See illustration:





Take the fret file you made out of Corian (I Hope) and just start sanding the frets. I use a rolling action moving slightly diagonal to the frets so the length of our Corian fret tool will encounter all the frets during each pass.



After a few passes you can examine the frets, you will see some have been sanded, and some have not. You continue until all have some metal removed. Here I have colored the frets with a marker simply to make them more visible in the photo, but notice the filings on the fingerboard, this will be a rough estimate of which frets have not yet come into contact with the fret file. Oh, also, do not press down on the fret leveling tool, that will cause it to warp creating an uneven filing action. Allow the weight of the tool to apply the downward pressure.

Do not scrub back and forth directly up and down the fingerboard, this can cause flat spots. The Diagonal motion across the frets will cause the board to naturally roll with the radius of the fingerboard thus preserving the radius. This is true of Compound radius fingerboards too.

Once you have determined that all the frets have been addressed by the fret sanding board you made, you can stop.

It's now time to crown the babies.

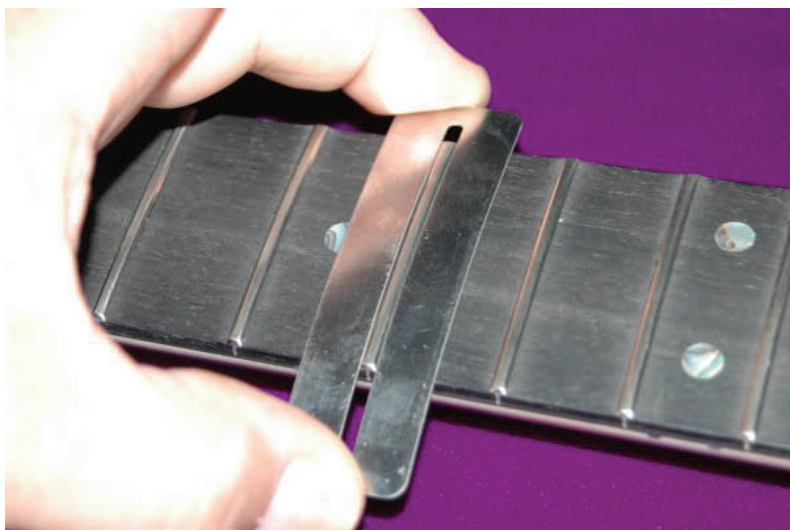


# Chapter Four

Let's Crown those boogers

Now the idea about crowning is to restore the round top edge. The Sanding board cut a flat top to all the higher frets, and if not crowned, the very slight distance variation can cause for poor intonation.

OH, I forgot.... You will need a Fingerboard Guard, a set of 6 costs about 10 bux from Stewmac. They just keep you from scratching the heck out of the fingerboard. They are a thin piece of Stainless Steel with a slot cut to be placed over the fret you are working on. They protect the fingerboard from tool marks should you slip, and you will slip, so order 'em.



So, place the fingerboard protector over the fret, then take the Fret crown file and simply file the top of the fret watching the cutting action, stop when it looks as though one or two more passes will remove all of the scratch marks the fret leveling board produced.

Repeat on all the frets, noting that some will require quite a few passes to get it to the point I mentioned

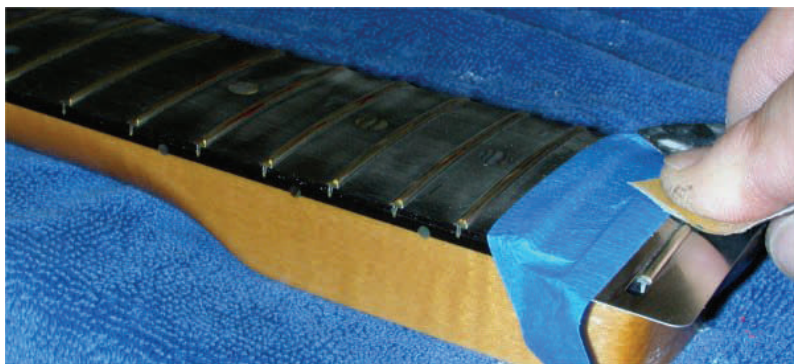


above, others will only take one or 2 passes. Just keep a close eye on what you are doing, and you will be fine.



You will hold down the fingerboard protector as you see in the previous photo, I'm not here because I only have two hands and one is wrapped around the camera.

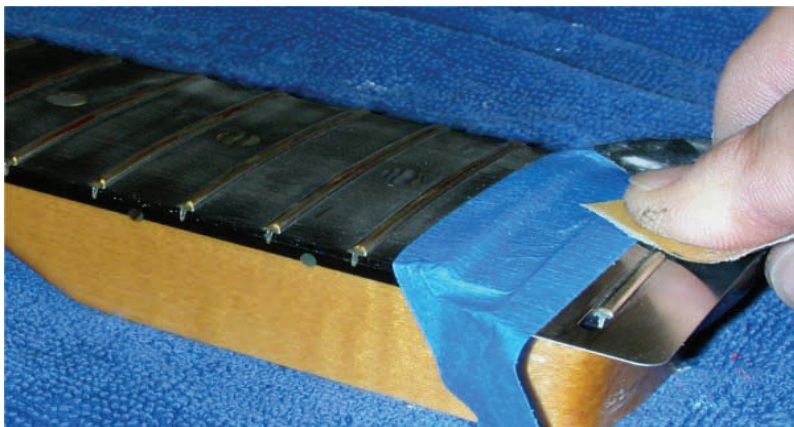
Once you have crowned 'em all, you will need to smooth and polish the frets. This is equally easy.



Take the scotch brite pad and run it up and down the edge of the fingerboard lightly abrading the ends of the frets. This removes any sharp edges and makes playing it much more comfortable.



Again, using the fingerboard protectors, first take some 320 grit paper and sand all the frets lengthwise, removing the fret file marks. Just proceed from one to the next. Once done, repeat with the 1000 grit. At this point, for all practical purposes you have completed the fret filing.



Some will like to continue on to a full polish. If you would like to do so, take a good cleaner car wax (it has a polishing compound added) and put a dab on a small rag and using one finger rub each fret. The fingerboard protector will keep some of the polish off the fingerboard and make cleanup easier.

Once done, take a small utility brush and dampen with mineral spirits, scrub the fret base and any wax that accumulated in the grain of the fingerboard. Clean the brush before proceeding to the next fret. This may take several passes to remove any residue from the fingerboard. A natural Maple fingerboard will not require the scrubbing with the brush, a simple wipe will do.

Now the booger's done. On to a setup.



# Chapter Five

## Ain't Quite There Yet

Now, depending on the gauge of strings you play, you must adjust the truss rod.

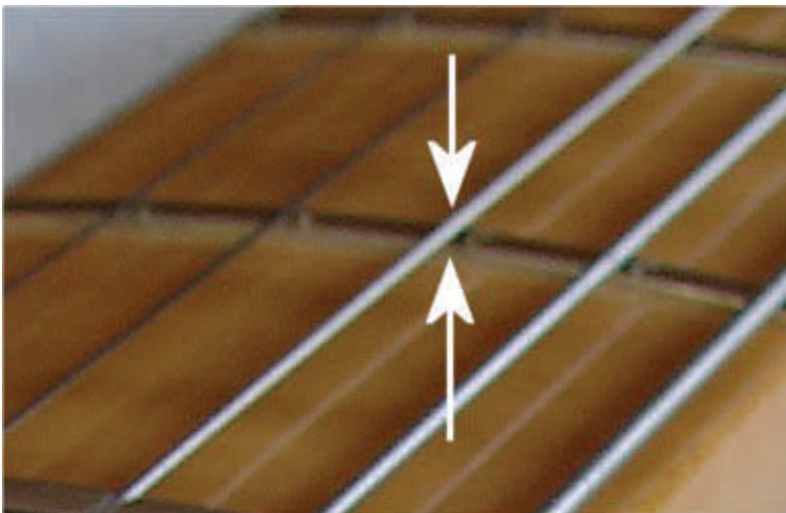
Taking the straightedge, adjust it until the tension just begins to make the neck bend back.

If you play 10's or lighter. You may stop adjusting with it level. 11's or heavier will require an ever so slight back bend. I would adjust it so that there is enough clearance for a business card. This is because the tension exerted by the strings when tuned will pull the back bow back to a slightly concave shape. This is trial and error because a Full "U" shaped neck will flex less than a Thin "C". Also, and this is important, once you have completed the setup, you will need to re-check it after a few weeks, because as the wood fibers take a set, the neck will bow just a little more.

Remount the neck, and string 'er up. Note this, string the guitar up with whatever you want to play for a very long time... you don't want to be jumping around from one size or brand of string to another. Stay with what you have. Now check out that nut....

The distance from the first fret to the bottom of the string when the string is at rest in the nut, should be about the same as the distance from the second fret to the bottom of the string, when fretted at the first fret. If it's close, that's cool..... because a few thousandths aren't going to make any real difference, and since you are on the up side of the learning curve, let's not complicate things.

If you have a considerable distance, you will want to make adjustments, but first you will have to make some nut files.....



While back at the hardware store, buy a cheap set of feeler gauges. You passed the Mechanical aptitude test, so you know what these are.

Once back in the shop. Take whatever you have, Dremel, grinder, whetstone, ugly looks, anything and round off the edge of the appropriate blade. For instance, if you are using 10's the E 6<sup>th</sup> is .047 thousandths in diameter, so choose the .050 (to give a little room) and round off the bottom edge. Now use whatever tool you have to rough up that rounded edge so you have a makeshift saw action. Do all 6 and you have a set of nut files.

Now tune your guitar, and adjust the bridge to the approximate height/action you want. Once there, notice the string action at the nut. Thinking in 64<sup>th</sup> of an inch, make a note like say 6<sup>th</sup> is OK, 5<sup>th</sup> -2 (two 64ths) 4<sup>th</sup> -1 and so forth....now you will know about how much deeper to cut each slot, or which to leave as it is.

I take a very fine point pencil and make a mark about where you want the bottom to be. Then cut away,

stopping a little (I'm talking thousandths here) shy of what I think it will be.



Retune... recheck..... remark.... Re-file..... retune....  
If you're happy, rejoice. If not, repeat again.

You anal retentive guys, don't get carried away, cut too much and you're putting a straight pin with Super Glue in the slot, brushing a little of the powder from cutting the nut in the slot., re-wetting it with the Super Glue (Cyanoacrylate Glue) and then re cutting... and a few thousandths really doesn't matter.

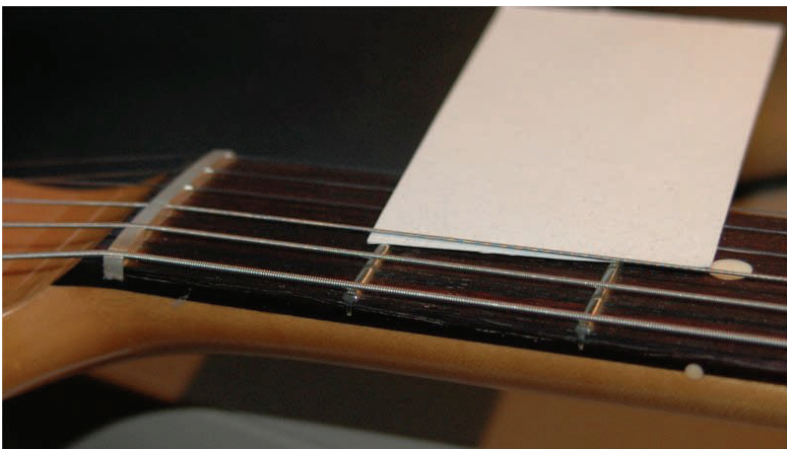
Now just 'eyeball" the strings and the nut. The clearance from the bottom of the string to the top of the first fret should be about the same as the thickness of a business card.

If you have cut them too far, and they buzz like a nest of hornets, take a sliver of paper, cut to the width and length of the nut slot and place it under the nut. This is shimming, and a very common practice in setting up guitars to precision tolerances. For those that just gasped and thought, "Won't that affect tone?" Fug-gidabout it. Think about it, the nut is only a real factor



in the tone of only six notes. For every other note played on the guitar there is a fret and a finger, or capo, between the singing string and the nut.

By now you should have a pretty good handle on cutting the nut. Oh I forgot, before you cut some exotic expensive nut, go to your local guitar supply store, or order online from [allparts.com](http://allparts.com) several blank nuts. They're quite inexpensive. They will give you something to practice on before you attack the expensive piece of Ivory you have been saving.



If you prefer a higher action over the pickups/pickguard you will want to shim the neck. Simply remove the neck and place a piece of card stock about 2" x 1/2" in the forward section of the neck pocket, reinstall the neck and you're all set. About 2 thicknesses of a business card will raise the strings about 1/16 inch.

OK, on to the bridge.

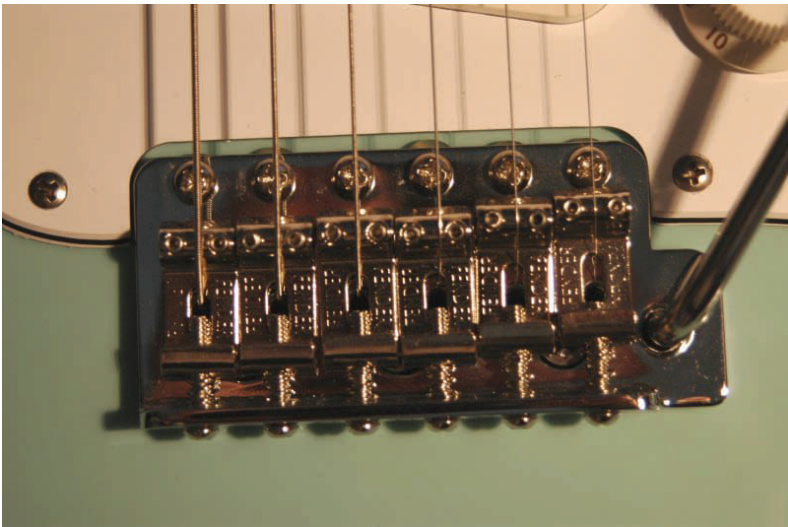


## Chapter 6

I gotta Bridge to sell ya.

Ok, now that the nut is cut, it's time to attack the bridge. Note to anyone in the Homeland Security Department, I mean the Guitar Bridge, not the Golden Gate Bridge.

Tune the strings approximately to pitch. Accuracy is not an issue at this point. Adjust the first bridge so that it is the same distance from the 12<sup>th</sup> fret as the nut is away from the 12<sup>th</sup> fret. Another way to look at it is to locate the first string saddle 25 1/2 inches from the nut, or the 12 fret is exactly in the center of the dimension from the nut to the first string saddle. On Strat and Tele type guitar with a 25 1/2 inch scale, that would be 12 3/4 inches. Now adjust the 2<sup>nd</sup> saddle slightly longer, and the 3<sup>rd</sup> longer still, the 4<sup>th</sup> should be about the same distance as the first and the 5<sup>th</sup> and 6<sup>th</sup> about the same as the 2<sup>nd</sup> and 3<sup>rd</sup>.



If this is a new guitar, you will want to adjust the tremolo height and spring tension. Tune the guitar to pitch, then raise or lower the tremolo mounting screws to get the overall strings height approximately where you

want it. You will fine tune each with the individual bridge height adjustment screws.

Note if the base plate of the tremolo is parallel to the surface of the guitar. If not adjust the spring claw screws in the tremolo cavity in the back of the guitar. Re-tune, and recheck the tremolo plate, readjust the spring claw, once parallel, and in tune, proceed.



Earlier I recommended that you pre adjust the individual bridge heights to approximately where they should be, and also the approximate 3 step, arrangement where the first string bridge is closest to the neck, the 2<sup>nd</sup> string is just a little farther away, and the 3<sup>rd</sup> is further still. The 4<sup>th</sup> is about where the first is. The 5<sup>th</sup> will be about where the 2<sup>nd</sup> is and the 6<sup>th</sup> is about where the 3<sup>rd</sup> is. Now check the string height again and raise or lower each string until there is about 1/16 inch clearance over the 21<sup>st</sup> fret.

Now fully tune the guitar accurately. I trust you have a good chromatic tuner. Seiko and Korg make several in

the 30 buck range. Check to see if there is any buzzing by playing a scale or two around the 12<sup>th</sup> fret. If there is, raise the corresponding string.



Once accurately tuned, check the tuning by playing the string open. Then pick it again with it fretted at the 12<sup>th</sup> fret. The tuner should indicate exactly the same pitch. If flat, shorten the distance from the bridge to 12<sup>th</sup> fret, or adjust the adjusting screw so that the bridge and/or saddle (whatever you call it) will move closer to the neck, if sharp, lengthen it or move it away from the neck. Repeat until the tuner indicates the same note when the string is played open, then again fretted at the 12<sup>th</sup>. Once you have adjusted it so the string is in tune open and fretted at the 12<sup>th</sup> fret, check it again, and again, fine tuning the bridge position until you have perfection.

Repeat this for the remaining strings, constantly retuning the complete guitar to maintain actual tension on the guitar. This is important because you are moving into a realm of intonation precision that few amateur guitarists ever encounter. You actually may not like it because you will find the guitar is no longer able to accommodate vast swings in room temperature or environmental changes. This is because as the guitar is

moved from, say, the trunk of a car where it is quite warm, to a room that is air conditioned, the difference in temperature will cause the wood in the guitar to swell or contract ever so slightly. This is rarely noticed in amateur setups, but you are moving into a whole new world. If this is the case in your situation, and you can't handle the constant tuning and re-tuning simply raise the action to allow for string clearance as the guitar moves to accommodate the environmental swings.

It is this reason that performing artists will have their instruments delivered to the auditorium where they will be playing hours before the actual concert. This allows their crew to check the guitars to see if further adjustment is required.

Note that some cheap guitars cannot be intonated. This is because they were built to convert your money into the manufacturers, or were built by someone that knew nothing about guitar parameters. Sorry, but it's true. You may be able to get them close, but never perfect.

OK, it's time for the final check, tune the guitar carefully, and fret the 5<sup>th</sup> string at the 9<sup>th</sup> fret. Pluck the 6<sup>th</sup> open and the 5<sup>th</sup> fretted. They should be perfectly harmonious. Repeat down the fingerboard fretting the next string at the 9th except for the 2<sup>nd</sup>, that one is fretted at the 10<sup>th</sup>, then the first at the 9<sup>th</sup> again.

If any are not in tune with each other, fine adjustments of the bridge position will correct it. Forward, if flat, and back away from the neck if sharp.

Now that you are happy, try the ultimate comparison, check the 6<sup>th</sup> open against the 5<sup>th</sup> fretted at the 19<sup>th</sup>.. the 5<sup>th</sup> open against the 4<sup>th</sup> fretted at the 19<sup>th</sup>. Continue but the 3<sup>rd</sup> open is checked against the 2<sup>nd</sup> fretted at the





## Chapter 7

I haven't seen anything  
that high  
Since I went to USC  
Berkley in '67

Now comes the final adjustment, the string height or action.

Fret, say G 3<sup>rd</sup> at the first fret and at the same time at the 21<sup>st</sup>. There should be an ever so slight bow in the neck leaving a gap of about the same height as, ready for this . . the same thickness as a business card. A business card is about .015 inch thick. DO NOT adjust it so the fingerboard and frets are dead level and certainly NEVER with a backward bow. The slight forward bow allows a slight clearance as each fret is fretted. Resulting in a pure note with no buzzing, buzzing is good for bees, but it sux for a guitar string.

To adjust the truss rod, locate the adjustment nut, on Gibsons it is generally located under the small bell shaped plastic cover on the head stock. On Fenders it can be at the heel, this will require removing the neck, if so, make 1/4 turn adjustments at a time. The adjustment nut may be located inside a small hole located on the headstock leading to the nut located inside the neck under the nut, or you may have a Bullet, in that case it's at the headstock and if you can't find it, you better quit before you mess something up.

If you tighten the nut, the bow of the neck will be reduced, loosen it and the string tension can pull the neck to increase the bow.

Now that that is done, you may begin by lowering the bridges bringing the corresponding strings down closer to the frets. Lower it until they are about .040 high. That is about the thickness of a well worn dime, or an old credit card. Once they are all at about the same height, retune the booger.

Now start checking by playing something, but no Neil

Diamond or Barbara Streisand tunes, and certainly not the opening to Stairway to Heaven. The guitar will explode.

Just play scales up and down the neck, particularly noticing the sound, listening for any buzzing in positions above the 12<sup>th</sup> fret. I strongly urge you to play in real performance style. I have seen players test with a light touch looking for the lowest action, then gripe because it buzzed like crazy when they got on stage and were beating the crud out of the guitar playing in their usual shredder style. So be real. OK?

OK, no buzzing, you can lower 'em a crack, retune and play it again Sam, continue until you are certain it will pass when you get on stage.

If, after the initial test, it buzzed, then crank the strings or the respective bridges up an crack, retune, retest, then make the next appropriate move, up or down.

If once you get the action about right and while playing the guitar above the 12<sup>th</sup> its sound is clean, but you fall back to the mid frets say, from 5 to 12 And you hear buzzing, it means the fret leveling was not done correctly and one, or more of the frets are ever so slightly higher than those further up the neck. Don't even bother looking. You will not be able to see it. I'm talking about a difference in height of .001 or less. That's about the thickness of a piece of clear Saran Wrap or a human hair, so it's back to the shop, or live with it, because your guitar is now a hell of a lot better than it was.

At this point it is purely a matter of trial and error, but stay with it and you will have one sweet playing axe.



## Chapter 8

Ok, I'm throwing you a life  
saver.

Here's a word about your quest for tone, and my experiences working with guitarists striving to achieve same.

First let's get the nomenclature correct. When you are playing your guitar and you notice the Telecaster sounds different than a Gibson Les Paul, that is not tone, that difference is professionally called the Voice of the respective guitars, like a Stradivarius has a different voice than a 99.00 violin from Music World, but they are both recognizable as a violin.

The tone is adjusted with all those knobs on the Guitar, Amp, and the supporting audio equipment many use today.

So, tone is altered by electronic modification of the signal as it travels through the amplification equipment and voice is the inherent sound of the guitar under any given circumstance. Another way to consider it, is you and your Brother, Sister, Mother, or Father may sound similar, even to the point when your voice is electrically transmitted, as through a telephone, the person on the other end may mistake you for one of your other family members, yet after a few seconds you can tell the difference between the voices heard and yours. So now we know what we are talking about when we say tone or voice, relative to a guitar. Or another consideration, a Swamp Ash Telecaster, an Alder Tele, and a Mahogany Tele will all have a slightly different Voice, but they are all easily recognizable as a Telecaster.

Now there are many different components that are said to have dramatic effect on the voice of the guitar. Most often mentioned are The Finish, Nitrocellulose vs. Polyurethane, the Wood the body is made of, and

how many joints are in the body, the tightness of the neck where attached to the body, the bridge, the metal the saddles are made of, the pickups, the potentiometers, or pots, used in the electronics circuitry, the material the nut is made of, the wood the neck is made of, etc, etc, etc. These are just a partial list of the things that have been floated about as being important for consideration if you are to have the guitar voice to die for. Most of it is bunk, and what remains is so slight so as to be insignificant.

If you just gasped in astonishment, hang on, because somewhere in the following rant, I'm going to tell you how to have a most remarkable sound, one that will stop the action, and make the audience, turn notice you playing and remember your name, and it doesn't cost much at all. That is what you want isn't it?

First, let's look at Nitrocellulose Lacquer.

It's sad, but today the word "nitrocellulose" in advertising copy, by a major guitar manufacturer, is meaningless, here's why. . .

Back in the '50s, the lacquer was the real stuff, genuine nitrocellulose; it was used because nitro dries quite fast which reduces production time. Fender often used DuPont Duco, an automobile finishing product. By the late '50's DuPont had introduced an acrylic lacquer, DuPont Lucite. Chemically, it is nothing like nitrocellulose, but it still dried lightning fast. It is the Lucite that was most often used for the metallic finishes. Fender DID still clear coat the Lucite with Duco, so you had Nitrocellulose over Acrylic. Oh, DO NOT try to do this at home, Acrylic and Nitro are NOT at all compatible. You will screw up your finish royally. You have to know what you are doing to get a nitrocellulose cle-

arcoat to go down over acrylics. Do it wrong and you get the splotchy, crinkly horrible finish you see on antique tool boxes.

One of the suspected characteristics of Nitro is that it will continue to shrink for many years, thus improving the tone of the guitar. That's the topic of another discussion, were just talking about the "mystique" surrounding Nitro today.

In the ensuing years since the 50's there has been any number of new formulations for coatings that have been used on guitars. The primary reason for the search has been the reduction production time. The faster a guitar can be squirted with paint and have it dry and harden to a point that it can be polished, the more money the manufacturer saves in production costs. That's it. That's why there has been a continuing stream of "new" finishes used in a Guitar's manufacture; it has nothing to do with quality of sound. Remember the "baked" automotive finishes of the 70's and 80's, that was all that was about, just rushing the drying time.

Today just about all finishes used on Guitars, Furniture, Cars, anything made that has to be painted as it rolls down the production line, use a catalytically accelerated finish. This means the finish is formulated with additional chemicals so by adding Heat, Ultraviolet Light, or an over spray of another chemical, or even some forms of radiation can be used to harden the finish FAST, like in minutes. Compare that to the 30 seconds it took nitrocellulose and acrylic to dry to touch, but they still had to air dry completely for about a few weeks before they could be sanded and polished. Urethanes otherwise known by us all as "Poly" is the most often chemically enhanced finish used on



musical instruments today. It is for all intents and purposes, a plastic coating. It is tough though. I gotta give it that much.

Now Jump forward to the mid 80's. This is when the Vintage Guitar craze started. The CBS junk years were coming to an end. CBS's Fender was just about bankrupt because few serious guitarists were buying their butchered products. Fender was sold to the new guys and they hired Leo Fender as a consultant. His recommendation, "Build 'em like I did." This meant nitrocellulose lacquer would now become a feature on some guitars.

Since Nitro takes so darn long to get to a point it can be polished, alternative methods were explored. Thus a chemically modified "Nitro" lacquer was used that can be catalytically accelerated. It bears NOTHING in common with the nitrocellulose lacquers of the 50's and 60's, nada, nothing. Other than this. . . and this is how they can call it nitro. The name nitrocellulose comes from the chemical make up. The "cellulose" is from a cellular component coming from the CELL walls of wood. Thus, pitch a little of that "cellulose" component in some mysterious concoction, and the Federal Trade Commission will allow you to call it nitrocellulose.

Now, why would Fender or anyone else do that? Because many of you guys want nitrocellulose lacquer because of the ancient mystique surrounding it. The merchants know the vast majority of potential customers don't really have a clue and couldn't identify dried and finished nitrocellulose if they fell head first into a bucket of the goop. But since they want it, the manufacturer will find a way to preserve the speedy manufacturing process, AND call the paint on the booger

what you want to hear it called, that is. .  
."nitrocellulose". So don't throw your money away,  
Poly sounds just fine assuming the guitarist can play.  
Today if you order a Nitrocellulose finish on your  
Fender guitar, they will ship it to you with the nitro  
over-coated over a polyurethane finish. This is intel-  
lectually dishonest but still meets the criteria for legal  
advertising. To further aggravate the situation, Nitro is  
only available on their better guitars, so you would  
think that in the 2 grand they are charging they could  
find a few dollars for a real Nitrocellulose lacquer fin-  
ish. Sorry, not gonna happen.

But there is good news, realistically it would take an  
anechoic room and a digital audio spectrum analyzer  
to really tell the difference between a Urethane fin-  
ished and a Nitro finished guitar's voice. So save your  
money.

One thing I can tell you about Nitro vs. Poly, Nitrocel-  
lulose has an "alive" feeling kinda like the beautiful  
skin on your Grand Daughters face, Poly feels like  
dead plastic because that's what it is.

Now let's shoot down the "Tone" thing completely....

As I mentioned earlier TONE is adjusted with those  
knobs on most guitars and amplifiers. It is usually  
electrically modified as it relates to an amplified instru-  
ment. Paint, construction and various other compo-  
nents that go into making a guitar create the VOICE,  
not tone, of the guitar. That voice is not adjustable via  
simple methods. Except by a luthier... well a rank  
amateur can change the voice considerably too.. You  
just don't wanna go there.....

And yes Poly and/or Nitro will indeed alter the "voice"

or resonant acoustic characteristics of an instrument, but I submit. . those variances are so slight that in a blind test, with similar guitars, virtually no one would be able to tell.. . . OH . . close your mouth, and read on....

Perhaps you may have noticed there are a few other things in the signal path between the plucked strings and the echoes reflecting off the wall in the back of the venue in which you are playing. They can all affect the sound to a certain extent, and just about all of them will alter the apparent “voice” significantly. That is unless you figure the guys writing the advertising copy for the Oxygen free copper guitar cords, or the graphite impregnated speaker cones, or the genuine vintage style vacuum tubes in the amps, or the effects pedals, or the strings, or the nut, or, or, or.. and on and on and on.... You do have a Power conditioner dontcha, ‘cause plain old 117 VAC ain’t near as sweet sounding as conditioned 117 AC...? Jezus..... Find a real electrical or acoustic engineer and tell him about that one... P. T. Barnum was right...

What of something as basic as the acoustic design of the room in which the guitar is played, and if the amp is miked, is it a Capacitance Discharge Electret Condenser audio reference Sennheiser or that over EQed on the low end \$34.95 special from Radio Shack? Now the difference between those two will make a hell of a difference in that “voice”. Oh Man! How many times have I been in a club and had to take Dramamine just to keep from hurling chunks when I heard the crud coming out of the PA system because a real audio engineer was never consulted when pertinent decisions were being made.

In those club PA’s you have an open mike for the vo-

calist and, of course you have all the guitarists all playing entirely too loud. The un-captured sound from all those tube amps CAN travel the 10 feet to the vocalists mike and get re-amplified too, thus affecting the apparent "VOICE". I'm sure many of you have been in recording sessions, where many of the various artists and their instruments are isolated by an acoustic barrier for this very reason. Notice also, the recording studio is a basic anechoic room, that's what all the blankets and fiberglass stapled to the walls is for.

That is why my mantra is PRACTICE. Because even with a really bad audio system a great player will amaze everyone, whereas average, is well, just average, plus whatever influence, good or bad, the crummy audio system has on the performance.

Any way, back on point.... If anyone ever noticed, when ever ANY audio device is analyzed, it is done in an anechoic room... that means the test room is not only sound proof, but no sound can be reflected around the interior of the room either. Now, take two identical (there is no such pair) guitars, one with a Nitro finish and the other with a Poly finish and it will take a pretty high-end and sophisticated audio spectrum analyzer to really tell the difference, acoustically. While YOU may notice a considerable difference, it's just a figment of your imagination. Close the mouth again, here's more.

A figment of your imagination, why? It is because of the psychosomatic influences. What that means is, you expect to hear a difference, and therefore you will hear a difference. That is why ALL honest audio comparisons are double blind tests. Actually any comparison test involving one or more of your senses has to

be blind to produce valid credible data. That means the one conducting the test doesn't know which unit is being auditioned and the one hearing the stuff doesn't either. That way there is no visual influence on the part of the one doing the listening because pretty or exotic, or over engineered equipment sounds better than ugly wussy equipment every time. Also there is no influence from the one conducting the test, such as, Ok, now here's that old piece of crud Poly Guitar, tell me what you think of this POS". Guys, that happens. Just listen to the dribble coming from a salesman the next time you're in a Mega Guitar store as he hypes the high commission made in where ever hack he wants you to buy. Then listen to him dis the classic piece you really want.

This psychosomatic effect is also why Law Enforcement investigators are taught to never begin an investigation with a preconceived notion as to the guilt or innocence of anyone. That is because they recognize that if the investigator is prejudiced going in, the subsequent investigation will tend to subliminally gravitate toward evidence that supports those preconceived notions. The Mind has a rather powerful influence over the host.

My experience back in the 80's was I was very into very esoteric audio...I'm talking about what was basically a record player and supporting electronics that cost what an exotic sports car would. I was party to a double blind test featuring audio reference monitors. That is, "speakers" to the "Best Buy" crowd. The most expensive and most highly rated then, were the Wilson Audio Monitors, those suckers cost a whopping 20,000.00 a pair in the 80's vs., the humble Magnepanar MG III's at 1500 bux. When those auditioning could see what was being played, the Wilsons won

every time, but in a blind test the Maggies absolutely skunked the Wilsons time after time. It's the same today. Pretty wins every time, of course the Wilsons were the size of a small bus which tended to awe the client with its dominating presence.

Back to point. Now take the same two identical guitars, one done in Poly and the other done in Nitro. Turn the volume on one up just a crack say .02db and bingo. Note that the audio increase of two tenths of a db is not at all noticeable as a volume increase. Still the louder one sounds "better" than the other. Such a slight sound level variation can be caused by any number of things in that line between the pick and the sound waves bouncing around the room. A faulty capacitor, a burnt resistor, chewing gum on the end of one of the plugs, a cold solder joint inside the 55 year old Blackguard, all can make a guitar louder, or not as loud as a comparable instrument.

Remember this is only the tip of a very complex acoustic, electronic, architectural, psychological calculus that yields the finished product and I didn't even mention the multimillion dollar digitized electronics that are involved in cutting a master, re-mixing it and getting it to CD... and what are you playing that CD on and what are you hearing it through?

Now in deference to those that just gotta have the Nitro, special pups etc., go for it. Music is a very emotional and psychological experience, and number one on most lists is you have gotta be in love with your instrument to perform at your best. So if you want a 1962 Danelectro made of Masonite with that skunky little lipstick pickup, you better go get one 'cause it WILL definitely effect your performance. Who is it, U-2 that plays those things?

Man, life is so darn complicated, unless you can play. Ya know, nobody ever gripes about the equipment a real artist is using, ever, except the roadie. And just for the record, as it has always been with acoustic instruments, and YES an electric guitar is as much an acoustic instrument as a Stradivarius. The best finish is NO finish. So between that and protecting the instrument there has to be a few compromises.

Who said Stevie Ray's Strat didn't have a finish? Go look again. There's still some lacquer on that Strat that hasn't been chipped off yet. Whenever you see advertising copy that suggests a special unique finish, its first, primary reason for being printed is to compel you to want to go buy one for that reason. It doesn't matter if it's a hand applied French polish, hand sprayed Nitrocellulose, mechanically dipped in heated chewing gum, or the luthiers has found a 55 gallon drum of the varnish Stradivarius used, it's all for the sake of expediting the sale. Remember, this is Marketing 101.

Now, sure some luthiers have sniffed enough wood dust over the years so that they ignore all the reasons I have outlined that can alter the voice of an instrument, and really think their guitar is actually the panacea of electric lutes, but remember as mentioned above, the psychological influences that can infect objective reasoning.

So to sum it all up, If you are absolutely convinced a certain wood, paint or set of pickups will make your guitar sound better, it will, it really will, but it's due to the mind playing tricks on your perception and not much at all on the real sound emanating from the guitar. Therefore my advice is, go for it.

But. . . To continue my previous dissertation and possibly help some avoid spending good money in search of what is at best the moving target of tone. . . really  
“Voice”

Earlier I was discussing how there are so many variables in the audio chain that exists, beginning with the plucked string, until the amplified sound reflects off the walls in the room in which the guitar is being played.

Since I was trying to be brief, an absolute impossibility for me, I neglected to mention several other variables that must be factored into the auditory equation.

The first of which is, the ears of the one trying to disseminate what “tone” actually “voice” the person to which those ears are part of, is looking for.

The problem for all of us, and I do mean all, is we have criminally abused those two most important components in that entire chain. If we, while playing wore hearing protectors, that would be one thing, but ya know, I can’t recall ever once seeing a guitarist with a pair on.

Since the Sound Pressure Level (expressed as decibels or db) at the ears of the typical guitarist playing in any given venue exceeds 110 db, hearing damage begins almost from the earliest performance. Of course we’re all young, know it all, and are invincible, so we don’t really give a hoot . . . So we just keep on playing cranking the gain up..

I don’t know the ages of those reading this, but I’m betting those of ya’ll in the over 50 set, have tinnitus, that is a constant ringing in the ears. This is often



caused by being exposed to loud noises like over powered amps. But it is a sure indication of a damaged auditory organ growin' on either side of your head.

Now take a damaged pair of ears and try to determine what guitar has the best voice. That's gonna be a tough one. Here's an example of what can happen...

Back in the 70's here in Jacksonville, a world class musician got the "to die for" recording contract with Columbia. They wanted him to produce as well as perform on the album (pre CD's). He recorded it here in Jax, at a recording studio I was in and out of quite often. The owner, a friend of mine, asked me to listen to the finished master. It was great music but the sound sucked. The musician's hearing was shot, remember he was the producer too, (oh, today he is totally deaf). The entire session had been so over equalized on the high end; it was like listening to cats screech while fingernails were being dragged over a chalk board.

The entire session had to be re-mastered, and fortunately he wound up with a successful album that paid for all the hearing treatment through the rest of his life.

The point, If you go to a firing range, they will throw your butt out for not wearing hearing protection, get a job in a noisy environment, they will fire your sorry butt for not wearing hearing protection, but... we have all been so cool so as to stand up on stage in an incredibly dangerous environment, wearing no hearing protection, and proceed to blow our ears out with some great music.

So if your hearing is crappy, you aren't really in a posi-

tion to make a rational judgment as to what sounds good, bad, or otherwise, are you?

Musicians will spend thousands on a new amp, their 4th or 5th, but won't pay the 25 dollar insurance co-pay to have their hearing checked. Kinda makes you say Hummmm.

So variable number one, can you hear what the heck you are trying to hear... Don't forget the psychosomatic effect of expectation.

The next thing to consider is this: in the world of scientific auditory examination and auditioning to determine sound variances, at approximately equal volume, if the pieces of equipment cannot be switched between within a few seconds. The ear cannot accurately determine a difference. This is because your CPU, your brain, will automatically alter your cognition to accommodate for those variances after only a few seconds.

Here is a visual analogy of what happens. Have you ever seen a photograph that was taken in a room with plain old light bulbs lighting the subject? Sure ya have, they are always Orange, Orange, Orange....or.. If the subject was under florescent lighting, they are GREEN as they can get.... But, you think.. I was there, I remember, it wasn't orange.. what the? Those guys at Insty Prints screwed up. Well not so... It's that darn brain of yours was adjusting and color correcting the input... just like your ears when you're listening to different audio sources of the same thing.

OH.. I just heard everybody gasp... Yeah....If the two different guitars are played at two completely different volume settings, or way different tone settings you will remember the difference, and it will be overwhelm-

ingly apparent, but I'm talking about a head to head comparison. To determine the "BEST VOICE" of a guitar, they have to be played as close to the same volume as possible when the comparison is made.

If you think I'm full of it, try this little experiment. Sit down in front of a reasonably decent stereo system with just the 2 speakers. Now play some music, and have 2 friends move the speakers around. You will notice immediately a difference in the overall tonal quality of the sound. Now. Go back to the original position with the speakers and play the music for a few moments.. turn it off.. and relocate the speakers. Turn the music back on.. and listen. Your perception will be. It sounds the same. Try it several times, this is your brain making the automatic corrections so you don't go crazy.

I know I'm getting kinda long, but in this "quest for tone" all of the above data has been squelched by those making a living selling you useless stuff to prevent you from making a rational decision.

I don't want to scare anyone off from going after the finest they can afford, because, as I mentioned earlier, the psychosomatic effects of what you have strapped around your shoulder makes a lot of difference, recall the Danelectro example.

I'll 'fess up... I love nitro, my guitars are all Fender (well quasi Fender), with the original vintage style vintage applied nitro, vintage style pups. I even have cotton covered wires inside, and I know none of that means bunk as far as the end result is concerned, but I just cringe at the thought of a poly guitar with plastic covered wiring. Heck .. I can't even stand seeing the serial number decal on the headstock of the new stuff.

Where did that come from? I personally just like the look and feel of a guitar built in the vintage tradition. I also know that will effect my perception of the sound coming out of it.

My, sometimes unwanted, advice has always been over the many years, before you make a decision, one the will cost you bux, be darn certain you're making an informed decision. The only way you can accomplish that is to assimilate as much info as you can, and this is important. . . WITHOUT arguing about it. . . consider the info, check it out (none of us know it all) then proceed.

If you can do that objectively, you will be soooooo much more happy with your purchase, and you will be completely aware of the many variables that have allowed you to come to the decision to make that purchase.

Most sales of "cult level" equipment such as Guitars, Cameras, Esoteric Audio, etc. are expedited by rumors, often propagated by ambiguous advertising. Such ads are written with the specific intent of legally saying one thing while compelling those reading the ad to come to a completely different conclusion.

Esoteric audio is a world class example. I was part of that culture before there ever was a Monster Cable. Then, somewhere in the late 70's, all of a sudden you had to have 12 gauge wires going to your speakers instead of the 20 gauge stuff we all bought from Radio Shack. Shortly thereafter, Mark Levinson introduced Oxygen Free 6 gauge. That stuff cost a hundred bux a side. Not to be out done, other wire manufacturers came out with braided, flat braided, coaxial, and what ever other configuration of copper going from the amp

to the speaker you could think of. Now you can spend a thousand dollars a side and still not have the “best Sounding” wire, if you believe the advertising copy.

Again, I recall being there for an “objective” test. We tried good ‘ol industry standard 14 gauge, against the hundred dollar Levinson wire. Daymmmmn if the Hundred dollar wire didn’t sound better, noticeably better. Of course none of us knew anything about the psychosomatic effects of seeing plain brown lamp cord, compared against the beautifully engineered Mark Levinson wires. Shoot, just the Swedish machined connectors on each end made us all want to install our speakers backwards so you could see ‘em. Remember, pretty wins every time.

And here’s the real deal, turns out, the 14 gauge lamp cord had a higher resistance per foot than the much heavier Levinson, thus there was at least a .02 db differential in audio output between the two. So, the Levinson being of a lower resistance allowed the amp to pump a fraction more sound out of the speaker, not a perceptible volume increase, but just enough to get your subconscious’ attention and make us plop down a couple of hundred bux for nothing.

Let’s see, we were discussing guitars, weren’t we? The other example about changing a bridge or whatever is completely true, and also greatly influenced by that darn internal psychology again. You just beat your brains for an hour changing a bridge, getting the guitar re-setup. . . of course if you know anything about a real setup, you let it set for a few hours to stabilize, re-set ‘er up, then start strumming. Do you think for a moment the vast majority of guys doing that kind of project are going to say, “well, that sux.” Not gonna happen, they are already prejudiced toward hearing a

VAST improvement, so they do. But in all reality, it's going to take weeks to come to a valid conclusion as he hears it under many different circumstances. To a professional luthier, when he hears that kind of experience, one word goes through his mind, "Amateur".

Here's more that can effect that final voice equation. I forgot, are you a heavy picker, a real shredder? Do you pound the heck out of 'er when you play, or do you have a soft style, ala, Chet Atkins, what kinda strings? Did you buy the axe and plug 'er into a 69 dollar garage sale amp? Or are you using a stack of Marshalls? Do you think the two may sound juuuuust a little different? Dang, there is soooo dawggone much info to consider.....Just go practice... and here is the secret to the amazing sound you all seek that I promised. George Benson is generally considered by the club of really elite professional guitarists to be the best, he practices 6 hours a day. I have done guitars for one of his backup guitarists who practices with him. They practice till their fingers bleed (figuratively). How much did you practice this weekend? You want to be a guitarist or would you rather be a whatever else you did this weekend? Like the musician said when asked by a lost guy in New York City, "Hey Man, how do you get to Carnegie Hall?" His reply, "Practice man, practice."

So please, all. Don't by junk, never buy junk, 'cause, well, it's junk, but don't by hype either, 'cause hype is just BS, and if you have ever been on a farm, you know, BS stinks.

Now, do you want an original Made by the Big F or Big G or would you rather have one made by a professional, not a factory line worker. Read on. . .

The bodies everyone uses today are made on the same type CNC machine Fender uses, as are the necks. Hey, get this; everyone uses the same pickups too. Didn't that "Partscaster" Tele have Duncans? Hummm, Just like some of Fenders most expensive guitars. They also use Bridges, Keys, Strap Buttons, etc, etc, etc... from the same manufacturers Fender uses. And aren't their best and only their best guitars assembled by master luthiers with years experience, just like the luthiers making custom guitars with the same exact parts the Guitar manufacturers use? Therefore the only real difference is the custom Luthier didn't buy the rights from CBS (who bought the rights from Leo Fender) to stick some other guys name on the guitars he makes. Other than that and the price, there is no difference.

I wonder what ya would really rather be playing, a Tele, assembled on an assembly line, one "Team Built" buy a bunch of people that don't have a clue what the guy next to him is thinking, or a Tele assembled by one guy, that loves the Tele, and does everything from the first thought, to see to it that the Guitar plays and sounds as nice as can be. I'll give ya a minute to think about that one....

Hummm, Hummm.. Laaaa, Di, daaaa . . . , Oh ya back.... So what do ya think? Do you want a name, or do you want a guitar?

Here's a little revelation. Did you know that back in the 50's and 60's you could walk into many Fender Dealers, I'm talking about the real Fender here, and stroll up and down a display with every part needed to make whatever Fender you wanted. Buy the heck out of 'em and make your own parts caster. Makes me wonder just how many 25000.00 Vintage Teles and

Strats were never even assembled in Fullerton. And just what exactly Leo thought about parts casters.

Now consider this. Most custom luthiers, unlike FMIC, would NEVER consider spraying a Urethane painted Tele, with Chemically Modified Nitrocellulose Lacquer, and trying to fool the buying public into thinking it was nitrocellulose lacquer, just like they used in 1953.....Or... laminate a veneer of Swamp Ash over a Poplar body and market it as a one piece Swamp Ash body. Yes, those have been part of Fender's marketing strategy and/or manufacturing technique.

Some people really need to take a good look at what is happening to the language in advertising copy. This is why so many guitarists buying a Guitar from a large manufacturer will bring it to me, and ask me rip it apart and reengineer it into something that approaches the upper limits of its potential.

It's not that I don't like FMIC's (Fender) guitars.. Far from it... If you gotta have a real Fender, they're the only game in town; some guys just have to have the "Real Deal". I'm cool with that. But "If you gotta have" is the key here. Just about any luthier can give ya for 2 thou what they charge ya 6 for. A Tele ain't nuthin' but a musical erector set. That's how Leo designed 'em. They can be put together good or Badly.... But....Any price much over 2 grand is beyond absurd for any thing you can realistically think of to make 'em from.

Those that have lived for and decided that only a genuine Fender custom shop Guitar will do, will rarely ever choose anything else. This is true, particularly if, when auditioning the guitar, they KNOW what they are playing. That's 'cause that very influential 6 inches of



grey matter between the ears will subliminally prejudice them toward the Custom Shop piece, and since the “Made by a private Luthier” isn’t a real Fender, it’s gotta suck to them. That thought gets us back to the double blind test scenario we discussed earlier.

See, FMIC or any other guitar manufacturer is in business for exactly the same reason as, Calvin Kline, Nike, Dell Computers, Allied Chemicals, Ford Motor Corp, Morton Salt, and Kentucky Fried Chicken. That is, to convert your money to theirs. That’s not a criticism, that’s what any business is supposed to do. Last year Fender made 250 Mil and I didn’t. What I have a problem with is the systemic corporate mentality, that is the flagrant BS they all propagate as they move to persuade you to give them your bux for whatever they are cranking out at the end of that “Team-production Built line”. Team built, JEEZUS... is anybody really buyin’ that hype?

As for someone owning one of the guitars made by a custom luthier and finding it OK at best, I can only wonder what kind of treatment, modifications, setup, or whatever other messin’ around with, it had been subjected to prior to that finding of “OK”. Further, sometimes, when someone orders a Custom Made guitar from me, or anyone else, they will typically demand crap parts at the recommendation of some friend that really doesn’t know what they’re talking about. Luthiers know the specs and components selected just will not produce a great guitar. But the “client” will demand it because their Sister’s Husband’s Cousin, works with someone that dated a girl that knows a roadie, that worked on one show Chicago did in 1976, and he said. . . . blab bla bla....you just gotta have a Kahler Tremolo the original not the new one... And guess what they say about the builder

and the guitar when it's complete? That's where most of this stuff about one piece bodies, Nitro Lacquer, Vintage Formvar wire, Fiber bobbin Pickups.. etc, etc, etc....comes from...when all ya gotta do is 1. Learn to play the damn thing...2. Turn it up. Is that rocket science?

Ask any luthier, they can all share horror stories of beautiful Guitars coming in that were subjected to the best intentions of grossly unknowledgeable owners. Of course, none of 'em ever know how they got "that way", and all blame the maker of the guitar. And hope they can make it playable.

Remember, there are a lot of wannabe guitar techs out there that should not be allowed in the tool department of a Hardware store without "Adult supervision". And many other good intentioned guitar owners with "unlicensed" Allen wrenches. They should be required to get a Concealed Carry Permit first. You would not believe the questions I get about some of my templates and publications. As Perry White would say, "Great Caesar's Ghost", and those guys wanna build and/or "adjust" a guitar. I have nightmares.

For every privately made by a custom luthier guitar that sucked, I have seen a hundred factory produced name brand guitars that sucked worse. Fortunately, they could ALL be readjusted back to a fully functional musical instrument. It's rarely the maker, more often than not it's the "nut" adjusting the nut on his truss rod that makes a guitar suck.

So, for those that just gotta have a Fender, go for it... do it... but take it to someone that knows what they are doing for that "tune up" otherwise it's gonna suck too. And for those that think those making guitars from

Fender Licensed parts produce sucky guitars, all I gotta say, is, Man, You need to spend more time practicing, 'cause I'm betting it ain't the guitar that sux., what sucks has something to do with that 6 inches of grey matter between your ears.

Man, I love these guitars, and frankly, I don't really give a hoot where they were assembled, or by whom. Ain't too crazy about the CBS era stuff though, but they can be made to play too. A good Welding' torch... a hydraulic press... maybe a touch of C-4, nothing' to it.

I just know that if some one says something a little provocative while discussing something as emotional as a guitar, it's kinda like poking a stick in a hornet's nest. I just don't have to run as fast. It can be more fun than taking' a fun trip in a Ferrari F50, with a long legged Red head keepin' ya company.. OH .. Jeez.. Did I just say that??? Must be that fall off the ladder yesterday....

By that reasoning, many of us could easily say Fender's guitars suck, based on the ones we have all come across that were rather difficult to stomach. But, that would not do justice to the many great guitars FMIC has left in its wake. You can't judge a book by a few pages that have been scribbled on by a 2 year-old. Go get another copy.

Since the overwhelming majority of those looking for a Telecaster, want one made by Fender, and only by Fender, it's easy to see why when they come across one that looks like a Tele, that is not made by Fender, they assume it is a cheap inferior copy. This mind-set predisposes them to find all kind of flaws and virtually no virtues. We call 'em Fender snobs but do so affec-

tionately. Then there are those that come with a more open concept of what they want, and invariably select something like a guitar made by a custom luthier. I say both have made the absolutely correct choice. And here's why. . .

Music is a very emotion driven endeavor. At the upper levels of talent, once the mechanics are mastered, it becomes 90% mental. (give or take <weasel clause here) If you aren't playing the very guitar you want, the one you have lived to have. If you are playing one you think is corrupted by compromises, your performance is going to suffer. So get what ya want, be it a Tele, Strat, Nash, Danelectro, Gibson, National, D'Angelico, whatever.. go get what you want.. and play the hell outta her. Like Nike says, Just do it.

This is why so many great performing guitarists are playing a guitar they have had since they learned C, F, and G7. But if you think Stevie Ray Vaughn's guitar was untouched, get real. Texas Specials pickups didn't exist when he was learning. About the same is true of Clapton's "Blackie" and many other famous Star's guitars. What they do, is maintain connection with their favorite Luthier, constantly having their "go to" guitar modified and improved to accommodate their more refined talent as time passes.

Oh.. in 1950, Leo was subcontracting parts. . . just like FMIC is doing today. Not much has changed except who owns the Intellectual Property, and the complexity of the machines cranking out the parts. My point was that when an employee flips the switch on a CNC machine, does who the employee works for make the output of the CNC shaper a better product, than one shaped by the same type machine in Puyallup, Washington? I don't think so.

Damn, You actually got through all that...



## Chapter 9

So this is the life.

Now, why do you need to do a fret leveling on a brand new guitar? Well as the frets are pressed into the fingerboard they encounter varying densities of lumber. It really doesn't matter what method it being used, a Fret press, a small hammer and a drift, it just doesn't matter.

As the fret seats, the different densities or hardness of the wood will allow them to be pressed in a little further or not as far into the wood as the previous fret. I'm talking about differences of only a few thousandths of an inch, impossible to see when looking down the fingerboard.

So, if say the 15<sup>th</sup> fret is 1/1000 that's .001 of an inch higher, about the diameter of a human hair, you will have to raise the bridge to keep the note played at the 14<sup>th</sup> fret from buzzing. How much? Well the action at the 15<sup>th</sup> fret will be at least 1/16 of an inch high, and 1/8<sup>th</sup> isn't uncommon. But if the frets are level, that action can be dropped to about .030, or about the thickness of a dime. That will speed up your playing considerably.

The next thing to be considered is the height of the pickups. Most guitars I have the opportunity to work on have had the pickups adjusted far too high. Most will do this because the closer the pickups the "hotter" the sound. But there are problems.

A pickup is designed to work in concert with the other mechanical parameters of the guitar. Most have a "Sweet Spot" a height at which all these parameters come together, and produce a beautiful sound. This is about 1/8 inch from the strings.

But there is another factor to consider. The pickup is



made of very powerful magnets, even if they are small. As those magnets are moved closer and closer to the vibrating string, the magnetic field can begin to effect the vibrations. The field can pull the string into an asymmetrical vibration. This causes what is known in the industry as “Stratitus”.

It is very common on the Fender Telecaster and Stratocaster design. The resulting tone of the string sounds exactly like a guitar with a grossly incorrect intonation. It sounds UGLY. Thus the height of those pickups must be correct. It is a trial and error method, but if you set them at 1/8 inch, you will be close.