

My Rant About Tone
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Tone starts with your picking and fingering technique. From the thin plastic pick, the thick nylon pick, a brass or metal pick, to your fingernails or even the soft tip of your finger, these all play a part in originating your tone. I have used a lot of different picks over the years, but I've settled on a Dunlop Tortex .073mm (yellow) pick, which I clamp between two tablespoons and heat in boiling water for around 22 seconds. This pre-bends the pick so that I can better hang on to it, but it also adds to the dynamics of how the pick interacts with the strings. It doesn't bend as easily once the pick is shaped in this manner.

In addition to a standard flat-pick, I use my remaining fingers to play counterpoint to the pick. When I play acoustic however, I use a thumb pick so that I have one more available finger for the counterpoint. I do not grow my fingernails out, but rather use the combination of the soft fingertip and the momentary contact with my short fingernail to avail me of two different types of tone. Some of the most famous "tone masters" never use a pick at all. Two that come to mind are Jeff Beck and Duane Allman.

After your picking technique, your guitar strings affect your tone to a degree. Generally the heavier the strings, the more powerful and full your sound. However, the heavier the strings, the harder the workout. I use light gauge strings because I don't play enough to build up those heavy calluses required for the heavy strings. Stevie Ray Vaughn used a set of strings gauged from an .013 up to .060 on his Stratocaster, and he raised the action very high. His tone is legendary! You'll get the best tone from clean strings, but using worn out strings does provide a specific tone, and has been used for that effect even in the studio.

Your strings are designed to interact with a magnetic field provided by the pickups in your guitar. Here is where a great deal of your signature tone comes from. I have found over the years that there are literally hundreds of variables affecting the interaction of your strings with your pickups that all affect the resultant tone. For me, I prefer the pickups as close to the strings as possible without introducing buzz. Some argue that the magnet's pull affects the string, causing it to sustain less, and produce a different sound. This is true, yet it produces the sound that I prefer. If you like more sustain, and a cleaner more true sound, move the pickups down from the strings. If you want some bite, and a little preamp overdrive in your amplifier, put the pickups up close to your strings.

Your choice of pickups is also a key to signature tone. I have used literally hundreds of different types of pickups, and discovered very few that I found acceptable. I prefer the darker "woman tone" that you get from your neck pickup, yet this introduces a number of difficult tradeoffs, especially when you get to the amplifier. I have finally settled on a guitar that carries a set of pickups that I find exceptional. My Grosh Bent-top Custom is equipped with Lindy Fralin neck and middle pickups, and a custom wound DiMarzio humbucking pickup in the bridge position. The Fralins have the smoothest warmest tone of any pickup I've used, and combined with the DiMarzio, the Grosh can make a myriad of good sounds.

One of the other setups I've used over the years is an old Telecaster that I modified with a humbucker in the bridge position. I wired in a Seymour Duncan Pearly Gates pickup. On this guitar, that pickup sounds wonderful. But something troubles me – Duncan's wiring instructions always define the coil away from the bridge as the one that is left on when you split the pickup. Yet this is not the position of the single coil that normally comes on the Tele, so I rewired the setup to split to the coil closest to the bridge. The tone is almost identical to the original single-coil pickup, yet I now have the flexibility to go humbucking for solos.

Once you get past the pickups, your guitar's wiring affects the tone significantly. There are two basic ways that most guitars are wired: individual volume controls for each pickup, or one master volume control for all pickups. There are variations on this theme, but this has been the general trend for years. There are tone tradeoffs for each of these methods of wiring. If you have a master volume control, you cannot introduce a little sparkle to your neck pickup by dialing in a little of your bridge pickup. However, if you have independent volume controls, you cannot raise and lower the volumes of both neck and bridge pickups simultaneously. My Grosh rectifies this problem by adding a blend control to provide the ability to

blend in whichever pickup is not selected, giving you the advantage of a master volume with the advantage of the dual volume control.

Your volume control's wiring is another area where tone is affected. Most folks know that Gibson guitars have 500K volume pots, and Fenders have 250K pots. The lower impedance pots tend to roll off some of the highs (a good thing on the Fenders they are used on). Years ago someone showed me the trick of putting a very small capacitor on the volume control to let the high frequencies pass through as you lower the volume on your guitar. I used a 180pF capacitor, but I fell out of the habit after a few years. My Grosh guitar takes this another step by adding a resistor and capacitor in parallel between the input and wiper of the volume pot. The Grosh loses no tone as the volume is decreased.

These controls on your guitar also affect your guitar's tone in other ways. Since the volume and tone controls are always wired in, they always have a subtle yet startling impact on the tone of your guitar, especially the high end, and the final output level. As an experiment one day I wired a switch into my old Stratocaster to bypass the entire volume and tone circuit, taking the pickups directly to the output jack. The tone of that configuration was like nothing else. In that guitar, I ended up making the bypass switch a permanent installation. When I wanted to solo, I batted the bypass switch and it really growled.

The type of wood and the configuration of the guitar's cavities substantially affect tone. I remember years ago hearing a song on the radio by Loggins and Messina, "Your Momma Can't Dance, and your Daddy Can't Rock and Roll." The guitar tone was unique, and elusive. Years later I purchased a Fender Telecaster, and wanting to add to it's capabilities I decided to wire the pickup selector switch so that you could have both pickups on at the same time (a mod I had done to all the Tele's I had ever encountered). But on this guitar, when I opened it up, the body had been routed for one of the other models of Telecaster available at that time. The routing included a large cavity that went up to the lower bout of the guitar for a switch, and a larger cavity where the neck pickup resides, presumably for the large humbucking pickup Fender was producing at that time. After I rewired the pickups and reassembled the guitar, I was startled to hear that exact tone I had heard years earlier on Jim Messina's guitar part. He must have had a similar Telecaster!

The type of wood affects the tone substantially. Harder woods such as Maple tend to produce a brighter sound, while softer woods such as Basswood tend to produce a mellower sound. Of course, combinations can be used to tailor the sound. My Grosh, being a bent-top custom, has a Maple top, which would normally be too bright for a Fender style guitar, but with the Basswood body on the Grosh, the overall effect is similar to a Fender's Ash body. My Telecaster is Ash, and has a different tone than that of my Les Paul, which has a Mahogany body with a Maple top. This is despite the fact that both guitars sport humbucking pickups. Each combination will affect the sound. Popular woods for guitar bodies include Mahogany, Ash, Alder, Basswood, and Maple. Even the choice of fingerboard affects the tone to a small degree. Here, typical choices are Maple, Rosewood or Ebony.

One of the most significant things that affects your tone is the scale length of your guitar. Ever wonder why you can't get that Les Paul to sound like Jimi Hendrix? I spent considerable effort in my early years trying to do just that. I bought a brand new Gibson ES-335, cut a hole in the top and added a third humbucker. I split all three humbuckers, and put in all sorts of coil tapping and phase inverting electronics. With the exception of the original pickups in their original configuration, the entire project sounded terrible when I was done! The reason is the scale length of the guitar. Gibson guitars as a rule have a shorter scale length than Fender guitars. This results in Gibsons having lower string tension for a given frequency than the Fender. This string tension difference affects the tone of the instrument. If you were to construct two identical instruments, made of identical wood, and equipped with identical pickups and electronics, but one had the Les Paul's scale length and the other had the Stratocaster's scale length, they would not sound the same. The Strat-scale guitar would have a brighter, more edgy sound, while the Les Paul-scale guitar would be warmer. Of course the string tension also affects how you play the guitar, which, as we've discussed above, can make a difference in your tone too!

Once you get off the guitar, the next item that affects your tone is your cabling. A good quality guitar cord is essential to get every nuance of your guitar's tone conveyed to the input circuit of your amplifier. Any

signal lost here cannot be recovered by any technique – you must insure that your entire signal gets in to the amplifier. When choosing a cable, don't let the price influence you one way or the other. I have purchased very expensive cables that are worthless, and very inexpensive cables that I've used for years and years. One good example that comes to mind are George L cables. These are very reasonably priced, and let virtually your entire signal through. There are many other quality cables that are reasonably priced. Try them out first though – you may be surprised to learn that you can actually hear the difference between two guitar cables.

Once you get to the amplifier with your toneful signal, there are an unlimited number of ways to treat this signal, all of which affect the final tone. Your choice of amplifier is necessarily one of the most important aspects of your tone, and you may find that you are engaged in a lifelong quest to find the right combination of elements to provide your signature tone. I have purchased amplifier after amplifier trying to define my tone, and it has taken many years (and thousands upon thousands of dollars) to finally arrive at a tone that I'm fairly satisfied with. Your mileage may vary, however, because what I consider great tone, you may consider toneless.

First, in my opinion, you must have some tubes involved in your preamp tone. While the DSP-based preamps have made major strides in the last decade, there is still nothing that quite achieves the tone of a well-designed tube preamp. Unfortunately, there are a great many tube preamps that also sound terrible for one reason or another. And being at the controls of a well designed preamp does not mean you will arrive at a fabulous tone – each preamp has a set of tone controls that can be used to convey a great tone, or to destroy one! What most guitarists are not aware of, is that the tone circuits generally used on tube amplifiers have a set of characteristics that defy understanding by simply branding them with the identifiers “Bass” “Middle” and “Treble.” This is because of several tradeoffs and design decisions that have been made over the years.

First, most of the current crop of tube guitar amplifiers that have all three tone controls fall into two general categories of tone circuits: the Fender type circuit and the Marshall type circuit. There are others (Vox AC-30 for example) but the three-band circuits are generally one of these two, with minor variations. What may not be obvious by merely turning the dials is that each control affects the others. If you turn the treble all the way to zero on a Marshall type tone circuit, then vary the midrange control, it affects the frequency response all the way up in the treble region! With a Fender style tone circuit, if you have the middle and bass controls on “5” and vary the treble control from “0” to “10”, the midrange dip varies from a low of 300Hz to a high of almost 1000Hz! It's no wonder I've always found it easier to simply put all three tone controls on “10” and leave them there! See Figure 1 for a graphical display of these effects, and Figure 2 for how the graphs were created.

Figure 1 – Tone Control Effects

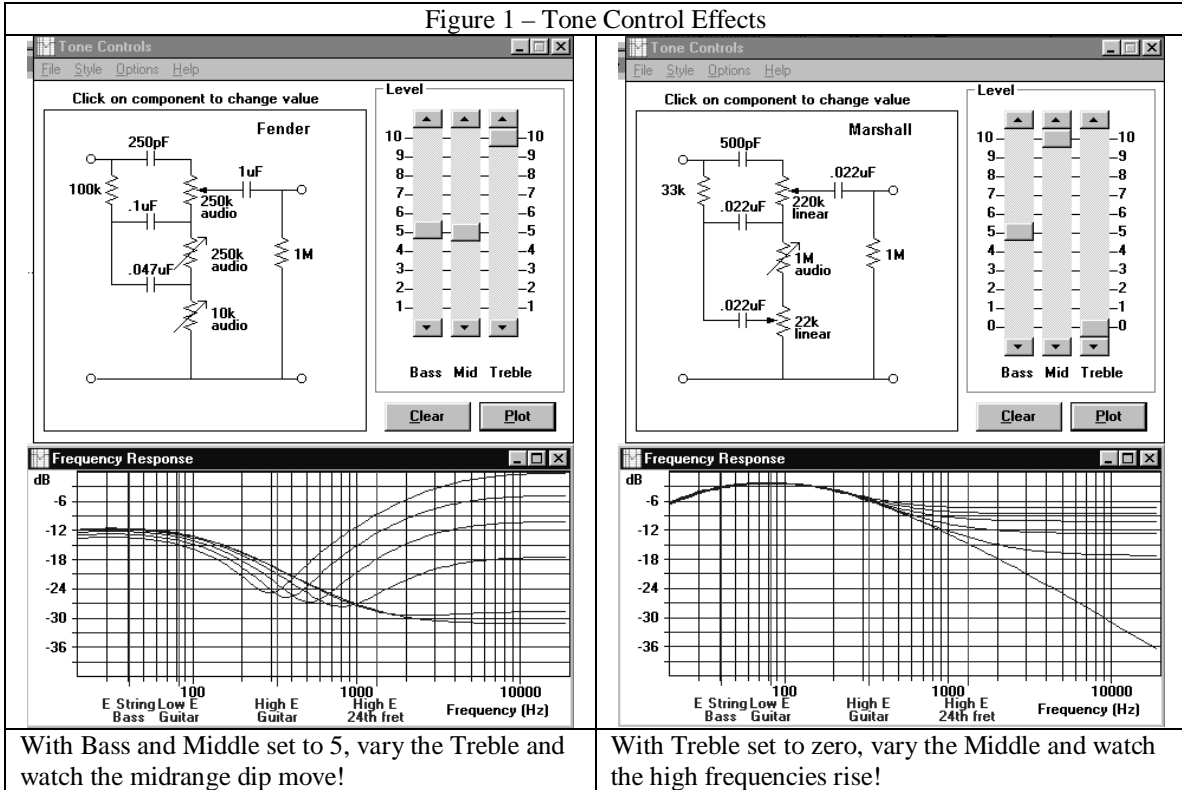
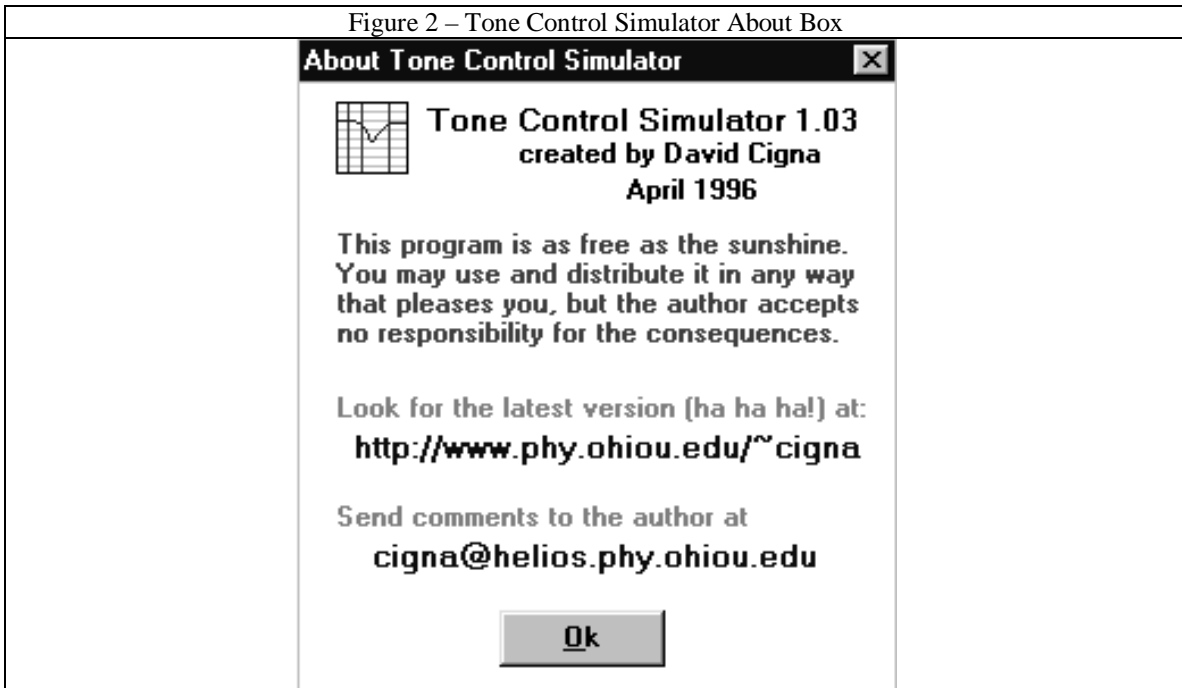


Figure 2 – Tone Control Simulator About Box



Don't get me wrong – I'm not saying these are bad designs, but what I AM saying is that when you turn a control, you may get a result that you don't expect based on the label on that control. This is very confusing, especially for the less technically minded musician.

Another aspect of the amplifier that has always bedeviled me is the fact that your guitar has two pickups with totally different needs as far as the amplification of that pickup is concerned. Each pickup performs

best with a specific set of tone and preamp gain settings. Unfortunately, if you set your neck pickup for the precise tone you want, you'll find that switching to the bridge pickup results in a less than appealing tone. Since the majority of guitar amplifiers have no way to dynamically alter the tone, you are stuck making the decision: Which pickup do I want to sound good, and which do I want to not use?

You can get an A/B box and haul around a couple of amplifiers (I've literally done this). Or you can get an amplifier with a channel-switching preamp, but these are generally not designed so that you can alter your tone between neck and bridge pickups. Rather, these are generally designed to provide both the Fender sound and the Marshall sound (ala Rivera), or to provide a clean, crunch and lead sound (ala Mesa, Marshall, and others). In fact, many channel switching preamps share the tone controls between all the preamps!

Enter the realm of digital switching circuits and digitally controlled analog circuits. While DSP based preamps don't convince me they are the end-all solution just yet, digitally controlled tone circuits certainly provide a solution to the problem of different tone settings for each pickup. Today you can buy a myriad of different tube-based preamps with the same patch-storing capabilities that keyboards have had for the last decade. Now you can point your guitar at a well designed tube preamp, with well designed tone circuits, and you can get the sound you want and save it to recall whenever you need it. Like when you switch from your neck pickup to your bridge pickup for example.

Each type of these new-generation preamplifiers offers different capabilities and controls. Some name the various preamps according to well-established vintage amplifier names or types such as Tweed, Blackface and British. Others simply provide a myriad of controls and signal routing and let your imagination run wild. What you choose should reflect your abilities and confidence in programming and alteration of the patches. If you're comfortable adjusting the settings on your computer, go for the latter variety, but if you have trouble operating your CD player, choose the former.

Once you've selected a preamp, you have to get the signal to your speakers. The power amplifier you choose will also affect your signature tone. Again, a good tube power amp should be considered here, as they generally provide what guitar players seek in the way of tone, distortion, and power. This is not to say that solid state power amps won't work. Even Billy Gibbons has Marshall ValveState amplifiers in his stage rack. But Billy Gibbons can switch to whatever he wants, whenever he wants, and he has a crew of assistants to do it! I need a power amp that comes through night after night no matter what type of music I'm trying to cover, and sounds good for all of it. For me, a tube power amp is the answer.

When it comes to live guitar rigs, there are several major types of power amps and a number of minor variations on the themes. Generally in the high-power category, you'll find power amps carrying 6L6 power tubes that are similar in design and tone to Fender amplifiers, and power amps carrying EL34 power tubes that are similar in design and tone to Marshall amplifiers. But remember that those guitar amplifiers have unique tone circuits built in, and you may confuse the overall sound of a Marshall to what you may expect from an EL34-based power amp. Don't – they aren't necessarily the same things. An EL34-based power amp will not necessarily sound "just like a Marshall." You may note some Marshall attributes in your tone however. Like a particular type of bite that you look for, or a singing quality that you may associate with an amplifier you're aware of. Or you may be looking for a transparent clarity that you've come to expect from your Twin Reverb or Princeton. These things are all very subjective and you must have your trial by fire. Check them all out and try them out in as many settings as you can before you buy.

I've found that most of the power amps available have some kind of presence control on them, and some have a "deep" switch or control too. In one of my tone quests, I purchased a Rivera Knucklehead guitar amplifier, and I find that its power amp section makes a perfect stage power amp for my DigiTech 2120 VGS preamp. The Rivera has a Focus control (deep) and a presence control and the effects return has a level control on it so that I can match it to the output of my 2120. All of these features affect the final tone of the system. I've tried other power amps and I find I like the tone of the Rivera better. In fact, I like the tone of the Rivera power amp with the 2120 preamp as much as I like the Rivera preamp that is built in to the system. It's just way more flexible.

After the power amplifier makes the signal “big” you need to send it to some speakers. I have to admit I’m very biased on this subject, based on my own subjective evidence. While the vast majority of guitarists today seem to prefer 12-inch speakers, I prefer 10’s. The 10 inch speakers have a different bark than the 12’s do, and they respond to the guitar’s frequencies differently. The other bias I have is that have never liked the midrange-heavy sound of vintage Celestion speakers. Yes, I may want that midrangey sound for a solo, but when I want a clean, airy sound, I don’t want to be forced to have that same mid-heavy speaker sound. I prefer the sound of really cheap speakers, in quantity. Four ten-inch speakers, rated at 15 watts each, are just right for my 55 watt Rivera power amp. I prefer the type of speakers you’ll find in the Fender Blues DeVille rather than the more powerful 75 watt 10 inch speakers that came with my Rivera 4 X 10 cabinet. Unfortunately, it is a rather expensive proposition to purchase a Rivera 4 X 10 cabinet, then remove all four speakers and replace them with Fender replacement speakers. You would be better off to try before you buy!

You can find Alnico and Ceramic speakers on the market. Vintage players seem to prefer the Alnico type speakers, but you’ll pay more. In my case, I had already heard the Ceramic speakers in my Fender Blues DeVille and I was happy with their sound, so I bought more of those. I may have actually liked the Alnico’s more. But the Alnico’s are almost twice the price. The type of magnet structure certainly does affect your tone, so you should try as many types as you are able before you open your wallet!

Once the speakers have transformed the electrical signal into acoustic waves, they must travel to your ears. This can be accomplished in a number of ways. You can stand there in front of your speaker cabinet and listen, but you will be hearing more than just the speakers. Your sound will be shaped by the reflections of your sound from walls, floor, ceiling, etc. Your sound will be affected by the absorption characteristics of your carpet, the people in front of the stage, the drapes hanging in front of the windows. The other sounds that may be bouncing around in your environment, such as your bass player’s thundering instrument, or that Leslie speaker connected to your keyboard player’s B-3 will also alter your perception of your sound. Your sound will be different depending on how far away you are from the speakers, and whether you’re facing them or facing away. If you’re recording, the sound will be shaped by the type of microphone you’ve chosen, it’s placement in front of your system, how far back from the amplifier you’ve set it, and what happens to it’s signal after it leaves the microphone element (here we go again!). You will get different results in every room in which you set up, and with each recording experience you attempt. For me, when recording, I like a Sure SM-57 right up to the center of one speaker, and then I like a condenser microphone placed back from the amp to pick up room reflections. You may like something entirely different.

I’ll never forget seeing Doyle Dykes at a guitar clinic at A Sharp Music in Renton Washington a couple of years ago. If you’ve ever heard any of Doyle’s CD’s, you know he has the greatest recorded acoustic guitar sounds. His Taylor guitar tone is wonderful on every recording. So when the question and answer period arrived, I asked Mr. Dykes how he got his recorded sound. He proceeded to describe the use of no less than six different microphones placed anywhere from directly in front of his guitar to as far away as fifty feet. He described the studio environment, the hard walls and the absorbent walls. He described his use of the internal pickup running direct to the board and split through a tube-style acoustic guitar amplifier. He mixes all these different sounds together to achieve the best possible sound. Recording electric guitar can be just as complex if you are picky enough about your recorded tone.

This leads to the final chapter of my tone rant. You cannot possibly tell what your tone is going to be like in an auditorium by trying out a setup in a closet at your local music store. This is the most difficult, tone-affecting problem you face. No matter what you try out at the music store, it will always be different when you get to the gig. You have several alternatives. The first is to find a music store with a staff you respect and who offer good advice (this is rare, especially if you like the rock-bottom pricing you get from buying direct or from catalogs). You can check with your network of friends when considering a purchase, and hope the friend who recommends something has the knowledge to make such a recommendation. Or you can just buy what seems right and take your chances. Unfortunately, I have used all of these techniques and shot down a small fortune in the process. I am happy to report however that my efforts have not been in vain. My Don Grosh Bent-Top Custom is the finest sounding (and playing) guitar I’ve encountered. My DigiTech 2120 VGS gives me all the preamp flexibility I need to make the Grosh’s pickups sound great no

matter what I'm doing and no matter which pickup is turned on. The Rivera Knucklehead's power amp provides all the tone and power needed, and my four Fender 10's in my Rivera cabinet have just the right tone for me. But as I've said, your mileage may vary.