

This is the full text of the Michael Hornick interview originally published in part in the November/December 2002 (Volume 7, Number 1) issue of *Flatpicking Guitar Magazine*.

Over past 30 years I've spoken with many luthiers of steel string and classical guitars. With rare exceptions, I've found them to have a wealth of knowledge to share on their chosen craft as well as many unique ideas on building their instruments. Some of the luthiers I've spoken with create immaculate reproductions of prewar guitars as well as their own unique instrument designs. Other luthiers craft instruments primarily of their own design, synchronizing with their innate artistic voice to create their own unique vision of musical art. Michael Hornick is one such luthier. Michael and I spoke several months back and my intended 60-minute phone call lasted nearly 3 hours!

How did you become interested in music and building guitars?

I've always loved music, but early on in my life I failed miserably on a few attempts to learn to play. I can't sing and the easiest course to learn to play is to back your vocals.

I have a friend who bought a Santa Cruz Guitar Company guitar back in 1977. It was their 9th guitar and it was just amazing. The guitar ran circles around his other guitar, which was a Martin D-35. I ended up calling the company and I asked if I could come on a Saturday and play their instruments.

Going back to the 7th grade, I took a wood shop class and fell in love with wood. I was in love with woodwork all my life and I had always intended to be a woodworker. As I procured tools and worked, I loved the idea of figuring out the particular job at hand, but I hated the building aspect of it and all I wanted was for it to be completed. I was never happy with the process. It was kind of weird that I loved wood working, yet I hated doing it.

I was a sheet metal worker doing wood work on the side when I went down to Santa Cruz Guitar Company. When I walked into their shop, I thought "Whoa, wait a minute! My shop is easily as good as this shop. How can they build this kind of stuff here?" That just turned on a light bulb and I thought, wait a minute, maybe this is it? I ended up buying a guitar that day. It was the 19th guitar that Richard Hoover and Bruce Roth had made. That day, a lifelong friendship started with Richard and I got really enthused on the idea of building guitars. He began to share everything with me. He would tell me where to get everything, the books and materials to buy as well as the organizations to join. Eventually I said, "OK, I'm gonna do it!" Richard gave me all the woods for my first guitar, which I'm proud to say, I still own. It's what I play everywhere and display it at the shows and what not. It took a year to build that guitar and I loved the whole process! I didn't get an apprenticeship, but I had a great mentor in Richard Hoover.

Is he your biggest influence in building your instruments?

Oh absolutely! My attitude when I was going into that first instrument was "hey, if I can't do what they're doing, I'm not going to do this a second time!" And in retrospect, I didn't get every single mitered purfling as perfect as I do now, but it was a helluva good first attempt. It was the best woodworking I had ever done. I

did a lot of things backwards, that today people would laugh at me! I bound the instrument and then I cut ledges inside of that to do purfles. I just didn't know how to do it. There weren't books written in the late 70s and early 80s that really took you through the process. Richard really is my best friend in the business and in relation to being a lifelong thing certainly is my mentor. Jeff Traugot is who I spend the most energy talking with. We have collaborative projects and we are very close, but my friendship with Richard goes back to the 70s. He's the one that made it all happen and supported me. In 1987, when he and Bruce decided that they really should do a small production shop, Richard called me and I ended up agreeing to go down there and I spent 6 months doing their finish work and then training the next person who turned out to be Steve Palazzo, who is my guitar teacher. I think they were building 8 a month by the end of that 6-month period, which was a lot. Jeff Traugot came on board at the time I was exiting the company. So I got a little bit of time inside of a shop.

What year did you build your first guitar?

1984-85. I finished it in 1985. And it was 1987 when I went down and did finish for SCGC. I had already quit my job and in fact I was already hooked up with Telluride Bluegrass and stuff was happening. So, I was off and running.

Can you share the details on your construction of your instruments?

The art of guitar making is, to me, about voicing and tone sculpting. It's the choice of the woods and how you manipulate them; making the bracing and thickening and all that stuff to end up at a desired tone. A bluegrass player is going to have different criteria than a fingerstyle player for tone. The shape of the guitar makes a huge difference in tonal qualities. A tight waist versus a soft waist like on a dreadnought changes the tone. My approach with a player is going to change with the type of music he plays. Then we are going to talk about guitar shape. Do we want a large tight-waisted guitar to have the big guitar sound with the small guitar directness? Do we want to do the smaller guitar and shoot strictly for a quiet instrument or do we want it to have a big voice on it? We are going to get some of those initial things, like scale length, dialed in, and then the woods are chosen based on the real priority, which is tone. Most bluegrass players will favor mahoganies and rosewoods, usually rosewoods more than mahoganies. One isn't better than the other. It's really up to individual taste. The next question is where they are going to use it? Will they want to be in the studio more than live recording or will it be a jam type of scenario?

And then I categorize the woods. For the brightest sound you're going to want to go towards the maples. A little less bright, and you are going to move into koa. To get that nice warm neutral tone you are going to move into mahogany. If you want to start to darken that tone you go into the rosewoods. And if you want that really glass-like, deep tone, that real ringing high tone, you will go to Brazilian rosewood. And that's going to flavor maybe 20% of the sound. Then, how you brace the top and what top do you choose to go with those woods. There are walnuts and a lot of different rosewoods, not just Indian rosewood.

There are a lot of great domestic woods that will build a wonderful instrument. However, I haven't experimented with many of those woods, because I'm always building custom orders. I basically give an opinion on what I work with and what I know happens with it. For example, with walnut, I have an opinion about it from other instruments, but I've never worked with it, so I don't know from first hand experience. Englemann spruce isn't a favorite of mine. There's something lacking in it for me. I've only used it on the mandolins that I build with my class

at Telluride, but there's something missing in it for me in the guitars I hear that use it as a top wood. I think the most important thing is learning to use the wood, whatever its characteristics, and paying attention to couple the right things together. Get the right top wood with the right back and side wood for the tone we are after.

In my X-brace, I open it and close it and move it up and down, all based on what I'm after with tone on the instrument. So it's not like I have 5 shapes I build with. I don't have a pattern of bracing I use on this shape and a pattern on that shape. It just depends on what I'm after. So I might have a 79° X on one, an 80° X on another and an 85° X on another. One X might be 1 ¼" from the soundhole and another might be 2 inches from the soundhole. It all depends on the tone I'm after in that particular guitar.

What are you hearing from the different positions of the X-bracing?

I hear different ways to favor volume, bottom-end, high-end—those kinds of qualities. If somebody's a fingerpicker versus a flatpicker there will be a different kind of dynamic attacking the instrument. I might open the X up or I might just simply slide it up in order to try to pop a little more volume if it's for the fingerstyle player, because he's not going to have the same quality of attack as a flatpicker. Opening and closing the X does much the same thing as moving it up and down; however, it changes the way the side parts of the plate work. I think all the parts of the plate need to be in vibrational synch with each other, they need to work together. Tone is what I'm referring to in the building process, not after it's strung up. If you worry about tone after it's built then you are stuck with what you got.

I use red spruce on all my bracing, including back and top. I've played around with German spruce and it's the closest to red spruce. I've used Sitka a lot and I think it is a great, great wood, but I like what I get out of my instruments when I work with red spruce.

I use laminated Brazilian rosewood for my bridgeplates. I really like what it does to the tone. Maple tends to give you a little warmer, softer tone, so it's another tool to sculpt sound. Most of the time, I'm going to get what players I'm building for want from the Brazilian plate. I laminate the plate so that the piece is 2 layers with one layer going cross-grain to the other. This eliminates the possibility of a cracked plate. The laminated plate is the same thickness as my standard bridgeplate. And most of the time when a bridgeplate is repaired, they add material to the plate, which messes with the tone. So it's like "Nope, build that problem out!"

For side braces and linings I always use basswood. Basswood is very neutral and yet allows the color of the wood, I feel, to be more effervescent, more alive. It doesn't do things with the tone. Basswood allows the tone to just simply emanate. Using a tone wood as a coupling device between the plate and the sides and the back plate: once again it probably comes from my mentor's perspective. When I've tried the cedar and mahoganies it tends to soften the sound and I don't like that. And again, my playground there has been in mandolins. The playground in the guitar isn't very big because I don't have spec stuff because I'm trying to build a particular sound for someone every time. The exception is that I sponsor Telluride Bluegrass, where I get to build what I want in terms of sound every year. My choice is often going to be in the idea of flatpicking guitar. That's what I do and it's truly my favorite in guitar music. All my instruments are going to be really great across the board. They are going to

be really good for rhythm, really nice on fingerstyle with plenty of effervescence and the balance is there. You can play it up the neck and all that kind of stuff.

Please tell me about a guitar you would build for a flatpicker. What you would envision we want?

Most of the time I would be thinking rosewood, with a dreadnought shape. I would use scalloped braces, rather than strictly tapered bars. I want to give it a really powerful clear, clean resonant bottom end, not—"muddy" is the wrong word to use—but nothing that goes in that direction. I want it to be very powerful and to be real direct because I think that's what creates the idea of volume. If you can hear it clearer, you'll think it's louder. I want to make sure that it has really crystalline highs and that it's going to go all the way up there to the 15th and 17th fret because flatpickers play from there all the way down to the low E! They definitely work an instrument out. In most cases I would do a 25.4 scale. Every once in a while they'll want it a little bit longer, but usually not shorter. People that like to do both fingerstyle and flatpick tend to prefer a shorter scale. It has to have enough clarity and volume. The other thing—and it's something I keep working on—is getting it loud for the player because that's a really big one when you're jamming: you have to hear yourself! If all the instrument goes strictly out the front, you're losing sound from the back and sides and it makes it makes it harder for you to hear yourself.

How are you accomplishing the player hearing more of the instrument?

It has mostly to do with thinking in terms of lightness, vibration, getting some tone coming off the sides. I'm sanding to make it resonate and then I'm X-bracing the back. I'm just getting so much better tone across the board...

Wait—you're X-bracing the back??

Yes as opposed to using parallel tone bars. I stopped doing that a few years ago. I stopped on one of the festival instruments and I just went "WHOA! This is doing something that it hasn't been doing!" which is really projecting without having additional volume; volume tends to hurt tone. So, I'm learning that getting the clearest, cleanest, most complete tone is what creates the idea of volume without losing tone. I think that the braced back has accomplished that task. It's allowed the back to be more alive and allow more sound to come off the back. When you play a chord and you touch the guitar to your body, the volume just dies. Leaning the guitar away from your body so that it's not touching your body, or just hanging on a strap, or just lightly sitting on your knee, it is louder. My earlier instruments didn't have that much differential in the volume. The back and sides of the body were giving off sound, but not to the degree that I think I'm getting now. I would say that of all the individual things I've done, X-bracing the back has accomplished the most. It also holds my shape true with less mass, which is part of the reason that I'm getting better vibration. I've also gone to graduating the back, so it's no longer flat. There are a whole bunch of things, so it's not so easy to say what it is you're doing to make it work.

It's always the synergistic whole and rarely the one little thing that makes a guitar sound great.

Right. That's one of the reasons I've tried to do little batches. I've built 4 at a time or 6 at a time and I can't do it. It slows me way down. I lose too much energy because I'm trying to focus on each instrument. Currently I have one instrument going and usually something else such as joining tops or prepping a

neck or something like that for the next guitar. Now, I stay more one on one with my instruments because I'm automatically adjusting.

I had a top crack on me recently. It went to the buyer in Colorado and it just opened right up. That piece of wood was in my shop for 15 years and was very stable. It opened up so much you could put a match book between the cracks. By the time it had been in my shop for a week you couldn't see light through the cracks. I keep very accurate records. I measure and graduate all my tops, I mic them and I keep a record if it. Once I get the plate working the way I want it to work, get the tones off it, get the effervescence and all the other things I'm after, I put it on the body and listen to it with a piano key hammer. I listen to it first then I cut the ledges and bind it, which is a huge wonderful step towards making it work right. From that point I do a lot of hand sanding and tapping and listening.

It's hard to explain what I'm really listening for. I want the tones to work together; I want the tones to be bass and treble tones. I want the treble tones to pull the bass tones over and vice versa. Perimeter sanding is one of the tools I use to achieve that goal. I think of it a lot like a speaker cone. You have this really heavy duty magnet in the center, you have this cardboard cone and there is this little fiber to hold it on the edge. I want my tops to have that same ability to "pump," if you will. The violin purfling is about tone. It's interrupting that plate so you can get that inner plate to function. Sanding is the final step in getting that unit to function and getting the tones to be balanced across the full range of the instrument.

Well, getting back to that top, I got to take it off and measure it and I thought "Oh wow, I took a lot off there but I didn't take any off here." It really was interesting to see what happens, because I really haven't known how thick my tops were on a finished instrument. I knew how thick they were the day I glued them up, but a lot happens after that. So that was an interesting experience.

Anyway, building one at a time keeps me focused. I'm constantly adjusting things for a final outcome and I can't make two instruments that sound alike. I've taken identical pieces of wood, the next set off of the billet, the top and the next set off the board for the back and I can't make them sound the same. They both sound great, but I'm thinking differently, I'm building for a different person, it's a different period of time, your space is different; stuff's just going in and out. I rely a lot on that intuitive thing, that inner voice that says "Hey, stop" and I say, "OK... where'd that come from?" I don't question it. There's always a reason for it happening and I just go with the flow and let it lead me, if you will. For me, it works. It's hard to teach, but I think that everyone has that innate ability if they've got their connectors on right for what they are doing. I never had my connectors on right for doing mechanics. I can build, but I'm no good at repairing anything. I can fix an instrument to a certain degree, but there's no way you are going to bring any valuable instrument to me. It's not my forte! I like to fix my old instruments because I can find out what worked over a period of time and what didn't. I much prefer to be the one to take care of my instruments. I build them so I can take them apart. I'm not epoxying things together [laughter] so, they won't come apart! What I do really well is build and it's always been that way. As a matter of fact, my nickname as a kid was the "little builder."

How about glue and neck joint and neck shape, frets, things like that?

I use yellow aliphatic glue for most processes. I use West Systems marine epoxy to glue on the fingerboard and to glue the carbon fiber bars in the neck. I use a double-acting truss rod. I have them made and I have the machinist pin the nuts on. When you braze or weld the nut on to the rod you ruin the metallurgy in the rod, so I have mine pinned on so that I have the full structural integrity of the 3/16" stainless in the rod. I have the threads rolled rather than cut, which is far stronger with more integrity in the thread and its displacing material instead of cutting material away. On either side of the rod I run two 1/8" by 1/4" carbon fiber bars. What I'm doing is making the truss rod work against the bars rather than just against the neck. This type of rod compresses the neck which means it bends backwards or it stretches the neck, causing it to bend forward rather than affecting the wood. I've learned to do that to the graphite. The fingerstyle players can do drop tunings and have far less changes occur in the instrument. That makes the instrument more player-friendly. I add a little bit of extra carbon fiber from the 14th to the 9th fret. That's where a neck will do the most bending. If you look at an electric guitar neck and it needs a reset that always where it has moved. So I've reinforced that area strictly for the purpose of a reset. So far, I dial it in and I'm there. I don't have any issues anymore with guitars needing a reset after 5 years. I really believe it's in the neck, not the body, so that's my approach on the neck.

I use a dovetail joint. I can string up a guitar without any glue at the joint and it's totally adjustable. Now, I've never done a bolted-on neck. We don't have hundreds of years to find out if those joints are going to work, but I know the dovetail is going to last for hundreds of years, so with any luck the neck joint will last as long as the instrument will last. I only use wooden binding. I stay away from plastic. Plastic is a vibrational sink. It steals vibrations. So, my theory is any instrument bound in ivoroid, which I used to use, that sounds great but would sound better if it had wooden bindings! I'm real adamant about that.

The types of top woods I work with the most are German spruce, red spruce and Sitka. I love German silver spruce and it's my favorite. I use Western red cedar or redwood on occasion for a fingerstyle player. Redwood doesn't have the same effervescence as the cedars do. I also use koa. I love koa for the top wood. The right piece of koa makes a killer soundboard. In fact I'm doing a collaborative project with my friend Jeff Traugot and I'm doing one for my ex-wife. You really have to be careful with using koa for the top because it really needs to have some properties that koa doesn't always have. It needs to be alive and have some real resonance.

How would you characterize what you hear in the various spruces?

I think German and red are really, really close. What you get is more headroom: you can play with much less energy and have really rich tones. You can really drive those woods and not start to break down. I think that there's a warmth quality across the board to the tones with those two spruces. With Sitka spruce, I think you get a little less headroom and at a really low volume it doesn't have quite as much tone. When you start to really drive it, Sitka starts to break down. However, I think that Sitka has the most incredible bell-like quality to it. If it's a really great guitar, you certainly hear it in the bottom, but it's most obvious in the high end say from mid-range up. That's what I would say is the main difference. Red spruce is real tricky because it has a lot of run-out and you really have to fill the pieces and check them out. Run-out is not going to hurt you if you are working with it correctly. But it can run-out really quick, in a matter of 2 or 3 inches. It's also difficult to find because of the twist in the trees. Since red

spruce doesn't grow as large as the other spruces, they twist and we have to use the entire half of the tree. That means you have to have plenty of the tree to get your 8 inches out of the half of the tree you are using. So, I think it's really hard to find what I call "artist grade" red spruce. I think that red spruce across the board with the big wide lines makes great sounding instruments, so I have no qualms building with it.

I'm excited to try some of the other spruces too, like the Italian spruces. I've listened to some, tapped on it and I was really impressed. It's very much like German silver spruce.

Have you worked with tops or backs with more than two pieces?

No, I haven't yet, but I don't have any qualms with it. You're putting a joint at the center anyway, so I don't see what the issue is. There may be a positive effect because two more glue joints in the top will put two slightly stiffer bars in place, which will react differently to tone. You also have a piece of spruce that's going straight across and interrupts that glue joint. That glue joint is similar to an I-beam. I think if you're paying attention it's certainly not an issue and it's certainly not an issue for the back to be more than two pieces. But, if you put a bunch of strips on the joints, you start adding mass and you start losing the top's liveliness and then it starts becoming an issue.

I remember talking to a guy early in my career who had made a four-piece bookmatched side, so it was one piece half of a side cut in four, opened up four ways and it worked. As far as I'm concerned as long as we can use wood, we are better off. If we use synthetics we'll never get the same thing. It doesn't mean we can't get something great, but we're not going to get the same thing. I think Rainsong is a great example of that. They definitely sound like guitars, but they have a different tone entirely than a wood instrument. I happen to give big kudos to Martin Guitars for doing the MTV guitar. I thought you've got all these broken sides and you've built a guitar! Harvey Fleishman certainly has turned my head around with doing half cedar and half spruce tops. I've played some of those guitars and they are great!

Do you think it's more of a combination of the woods or do you think it was what Mr. Fleishman heard in his head and built it to reflect what he heard in his head?

I think it's a combination. I think that the woods he was using were excellent tone pieces and then he's a master, so he can pull the most out of it, manipulate the most out of it. Bruce Roth, one of the original owners of Santa Cruz Guitar Company, said something to me which I'll paraphrase: "A great guitar maker can make a great guitar out of a mediocre piece of wood, but a mediocre guitar maker cannot make a great guitar out of a great piece of wood." I think it all boils down to the individual builder. Is he paying attention and is the craft speaking through him? If so, it's like me saying "Englemann is not good wood": totally bogus because I'm not the one doing the listening and I'm not the one doing the building. What's important is that the builder builds with materials he's comfortable with and that he knows what he can get out of those materials. I think that the better you are, the more you can get out of anything. I'd like to be able to experiment with 2 different pieces for the top, but that's a lot of effort to see if I like it! I'm only doing 7 or 8 a year. 8 is my goal, so that's a big price to try something completely off the wall. The other part of that for me is that I have people that have been waiting a lot of years for one of my instruments!

Do you use any CNC on your instruments?

No! I'm archaic. [Laughter] I use routers and power tools, but I do everything by hand. I hand-cut all my inlays and most of the time I'll make drawings up. Sometimes the customer will have a drawing like the one I just did one for a guy who is an architect. I did this really cool compass rose for him around the twelfth fret. It was almost like a partial glimpse of the inside of clockwork. I did it all out of ivory from old piano keys; I have a lot of piano key tops. I did it all black and white with the exception of the center of the needle, which was turquoise and the needle was mother of pearl. Everything else was white. I've done flowers and, Celtic knots; I've done Christian things for people who do their music for GOD. One client's friend was named "Turtle," so we put a turtle on the heel cap.

What I'm trying to do is build your dream and your heirloom, and I want it to be one of a kind for you. The customer is involved in the design so we are creating something together. Usually you can figure it to be \$1000 over the base price. Now, if you are after that working instrument and you want it simple, that's fine. I have no issue with that; I love simple. [Laughter] Then you're right at the entry level instead of the upgraded price. So, like the guitar that Peter [McLaughlin] had, it was Brazilian rosewood with a Sitka spruce top, herringbone trim and dots on the fingerboard. It was simple, but it was a great guitar! I had it for a little while doing some work on it for the new owner and I didn't want to send it back! It was number 5. I still have number 1. It's always fun to compare the old ones to my new instruments. In fact, I love to get my instruments back. It tells me a lot about what's happened to them.

Is there a specific sound you are looking for in your instruments?

There's a specific quality in the sound that I'm always looking for, and that's absolute balance. I want balance in volume and in tone. I want it to register from the bottom to the top flawlessly. I don't want you to feel like you are jumping into the next zone. I want the tone to always have the "surround sound" effect because I think part of that is the high overtones pulling the low overtones and the low overtones pulling the high overtones, but I also think there's something else happening and I don't know how to quantify it, but let's call it "surround sound." In order to have balance and surround sound other things have to be in place. You have to have a certain amount of sustain, but it definitely has to be balanced—both tonally and volume wise—and you have to be able to play it through up the neck. Whether the tone is an explosive tone like I would do for a fingerstyle, or whether it's that real power hanging in there that only happens for a moment in flatpick, I want the tones to have that surround sound and I want it to be thick. I don't want it to be thin and harsh. My maple guitars are bright, but they are thick. They aren't thin and bright.

How many guitars have you built so far?

I think I've done 104. I have to go back and count. I'm never going to be known for numbers, I know that! [Laughter]

Can you tell me about some of the folks who are playing your instruments?

Most of the people who have my instruments are people who have raised their kids, put them through college and are now doing something for themselves. I've got a few big players. Lorin Rowan bought my first 12 string, Pat Flynn got a 12 string, and Larry Keel parted with his, the rascal! [Laughter] There are not a lot of big time names playing my instruments. I think part of it is that I've always had to charge real money to keep doing this. Man, a lot of those artists are not

making all that much money. It's not so much who has them; it's that when they get them, they won't part with the instruments!

If someone ordered a standard D-28 style guitar, how long would it take you to build it once you started?

It would probably be a 5 to 6 week process, with probably about 2 ½ to 3 weeks to get it into finish. A week to get the finish on, there's the cure time and there are a few days for the rub out, setup and put it together and all of that. So, it's probably a 5 or 6 week proposition from start to finish.

What type of finish do you use?

I use nitrocellulose, the McFadden brand. Finish is a catch-22 situation. Finish robs us of tone, but you've got to have it. I can control the finish thickness. The drawbacks are that finish will craze and it will crack, but that's a good thing because the finish lets go and quits holding the instrument back. But that can be a real issue if someone has an issue about the visual. If they want that guitar to always look perfect, they are not going to get it out of nitrocellulose, but it's repairable. I can get back into it and that's really important to me. It's also organic, it's not fiber. I even have an organic concoction that I make to seal the insides of my instruments. Basically it's turpentine, rosin gum spirits, turpentine and rosin. I'm putting rosin back in to seal the guitar.

You're sealing the inside of the box?

Yes, I seal the inside of the box. For me, everything has to be first and foremost for tone. Directly underneath that is structural durability and everything that goes along with that whole issue. Every one of the instruments I've sealed has had more of everything. There was no doubt in my mind that more sound was happening. Because of the problem with the top opening up in the guitar I sent to Colorado, I obviously don't believe anymore that sealing the inside of the box is going to make a difference in whether an instrument is going to crack. It takes a seriously dry environment to crack an instrument. I had hoped that it would retard that process, but I think what it does is similar to sealing the ends of the board. You now have both sides allowing the transfer of moisture in the drying process happening at a more uniform rate. So, I think the wood stays more stable.

And retain more moisture?

Well, not so much retain more moisture, but sealing lets the moisture go at a slower rate so the cell walls dry at a more uniform rate on all sides of the cell rather than the inside walls start to dry first because there's nothing inhibiting it. The top side of the cells—the outside of the instrument—are going to stay elastic longer, so now you are going to have a different pattern of vibration in the cellular material, which is what's producing the sound for us. I think you want those cell walls to dry uniformly. I believe that helps with the long term effect. To my ear, the immediate effect is that I'm getting more out of my box and the sound is just jumping out, so I continued to do it. Everything is an experiment and I change only one thing at a time. I changed only sealing the inside of the box, but I didn't change anything else and I loved the instrument. I did it again and thought that something's definitely happening here! I haven't gone backwards on that aspect and I'm still doing it. It's also a visual thing. It makes medullar rays just jump right off those tops. For figured woods, it's almost like I scrape. I put a lot of instruments into finish by just scraping and not sanding because when you build with figured mahogonies and figured maples you get

such a crystalline depth to the figure in the wood. I can sand the wood and put the sealer on it and it looks as good as if I've scraped it. I'm not using the vinyl sealers I used to use. Most people will use a vinyl sealer to link lacquer to the wood. Lacquer wants to adhere to itself more tenaciously than to something else and so what happens is you build a film and then the film wants to lift off the wood and the sealers are cross linked that make the lacquer bond to it and it bonds to the wood, so this sealer does the same thing. The rosin does exactly the same thing with fewer chemicals, which is good!

You mentioned something earlier about shaping the tops so that the players get more of the sound of the instrument. Have you tried other methods such as enlarging the soundhole?

Well, I think both the size and shape of the soundhole will affect the sound and will affect the note. You can make a note with your mouth, open and round and then you increase the size of your mouth a little or decrease it and it affects the note. So, there's no question in my mind that the size and shape of the soundhole affects the way the sound is coming out.

What I think I was saying—and perhaps I didn't say it clearly—is that a tremendous amount of the sound is coming off the entire instrument, not just out of the soundhole. It's coming off the instrument itself. It's radiating from the top, sides and back, so changing the soundhole is going to affect the sound, but it's going to be a smaller part of the effect. Now I think that if you take a regular dreadnought and increase the size of the soundhole—which is what happened to Clarence White's guitar that Tony [Rice] now has and with the Santa Cruz Guitar Company's Tony Rice model and the Clarence White model and all of those others on that pattern—I do think that there's openness to the sound immediately, an open bark to the sound that is caused by that large soundhole. I'm making flatpickers happy with a 4-inch soundhole, so I haven't made one yet with a larger soundhole, but it definitely has an effect. The placement of the soundhole has a big effect. Quite honestly, I don't think that the right spot was chosen for the soundhole, which is right in the middle of the acoustic I-beam. [Laughter] How did they get from F-holes to a soundhole in the middle of the plate? I don't know, but it's obvious that we have figured out how to make it work and it works great.

Where do you think a better spot would be for the soundhole?

I think those upper shoulders are a great spot. When you keep that center plate clear, you have twice as much plate now to work with.

Like the Anderson archtops?

Yeah, like an Anderson or a Klein. You know Klein did the bass guitars for Taylor and it's a Kasha style. There are bunch of the folks in the classical world who have been moving soundholes for years. A bunch of them a few years ago had soundholes in the sides and it was marvelous! I mean, let's talk about player sound! Let's have a little door there. Linda Manzer had a gorgeous archtop and a couple of flattops and she had little ebony doors that slid open and you could have a soundhole come right at you!

The thing that I'm doing now is working really hard on the plate on either side of the fingerboard. I'm using the bar that supports the bottom part of the fingerboard as an open bar with braces up on top. I'm trying to energize that whole part of the plate. I think that's another one of the things that makes my instruments seem like they are louder as well as improving how the player hears

the instrument. I'm definitely getting that part of my plate to work. I don't consider that area as non-functional.

Do you use a popsicle brace under the fingerboard?

No, the brace I'm using now is 1/2" wide and is probably 13/16" tall but only 1/16" of an inch touches the top right underneath the fingerboard. It's kind of hard to explain, but I've opened that bar up on both sides so that the top is not inhibited. It's coming off the side to the center and it's being supported by the way I carve the brace. So, I'm still supporting the end of the fingerboard, but I'm not supporting it by inhibiting the top from the rim to the fingerboard. That whole space up there on the guitar—that 4 or 5 inch circle of space—is now a live, usable space and it's tuned. I think the traditional design doesn't take that into consideration. You've probably heard how people hot-rod their guitar and take out the tongue depressor and do other stuff up in there. Well, the tongue depressor is really important just to help keep the fingerboard from cracking the top. So, you want that immediately in front of the block and you want the block to be considerably wider than the fingerboard so that all that area is reinforced, but only right there because you have the opportunity to have the rest of it available. My tongue depressor is only a little bit wider, a little bit longer than the fingerboard is wide. To me, braces are communication channels. They do structural things, but that's not the big deal. It's about communicating information and getting the maximum usage out of your speaker, and getting the information communicated to all of the instrument so that it's all talking to you. So, I'm doing a lot of work up there on that part of the plate. I've been focusing on that area the last three years quite a bit.

I always use ebony fingerboards because they last as opposed to rosewood. For the bridge rosewood warms and silks the tone up and ebony crisps it up; same thing with pins. I use fossilized walrus ivory (FWI) pins because that weight, that material is so much harder than the ebony. When you take a Martin guitar with plastic pins and you put ebony pins in, it'll instantly have better tone. It'll be crisper, cleaner, and louder. Everything about the tone will expand. And when you go from ebony to bone or FWI you get another jump, the same way. The same thing with a plastic nut versus a bone nut or FWI. I do bone on the nut and saddle and I do FWI on the pins. Saddles and nuts wear out and it's like they'll be there for a while to somebody will use cardboard under to shim it because they won't want to set it up and it'll kill the tone! I'm really against that one, but those materials are important.

I'm also a believer in a one piece neck and I do my darndest to make sure I can build a one piece neck. Maple has been a catch-22 situation. I actually had a board that I got 4 necks out of that are all one piece. For both maple and koa when I've built those necks, I have to do two- piece necks, but I much prefer the one-piece neck. I prefer the tonal properties of it and I like the movement characteristic to be uniform. There is another school of thought—that I give full credibility to—that multi-piece necks are going to be stronger and stiffer and have fewer problems down the road. I'm hoping my graphite boards and truss rod will handle that because I seem to have real good control of my neck now.

What's your philosophy on setups?

It really depends on what the player wants. To me a standard setup would be two-and-a-half 32nd's to three 32nd's treble to bass at the 12th fret. If they are a Tony Rice, it's going to be a 1/16th of an inch. If it's the guy in Beaujolais, it's going to be at 4 and 5! [laughter]. I tend to set my nut about 4 or 5/1000th's

above the 1st fret. For the relief I do it by eye, but when I measure it, it's right around .008" on the low E (6th string). It really makes a difference for whom I'm doing the setup for and how articulate a player they are. There's this German fellow that I just have to dial it in for him because he has the most sensitive touch and is very aware of the minutest change. I try to find out as much as I can on what they are going to do so I'll know how much relief to put in the neck and set the height accordingly. Same thing with the neck width; most flatpickers want a 1 11/16" nut width and most fingerpickers want either 1 3/4" or 1 13/16" nut width. I did a 1 5/8" nut for this one fellow with real small hands. It was so small, but it was perfect for him and it was exactly what he wanted.

To get the perfect setup that doesn't buzz [laughter] I think that's the right hand! I played Tony Rice's guitars. I was good friends with the guys when they [SCGC] built his first one and I actually got to be there before Tony saw it and they set that action up at 1/16th of an inch, but Tony doesn't buzz! I've listened to Tony too many times and he doesn't buzz! [Laughter] I can't play his guitar without buzzing, so I think you really have to pay attention to the player. If they are a classically trained player they are almost undoubtedly going to have a consummate right hand because they are going to have focused on it. If they are coming up through the folksy thing the right hand is not going to be quite as articulate. That's a generalization, but I pay attention to the answers I get and usually I get with the people that I build for. I actually watch and listen to them play. It's harder when I don't get to watch them because my ass is on the line more because I'm trying to build their dream and not getting to watch them. That's the other thing about a longer list: there's more of a chance they are going to make it out this way or I get to where they are at and see them play.

Mahogany is my choice on the neck material. I dearly love tone mahogany. I just think it's a great wood. It's going to be on the C.I.T.I.S treaty. Mahogany has just barely escaped getting on the list the last couple of years and people should appreciate it because it's going to be going away just like Brazilian rosewood.

Have you had much experience hearing them after you've sent them out? Typically, tone progresses after a year or two. How long do you believe it takes for your instruments to open up?

I would say you are looking at 6 months to 5 years on the average. Sometimes all of a sudden, 2 or 3 years down the road they sound incredible, but other times it seems like in the first 6 months they've opened up and gone crazy. They all will finally open up and have a whole lot more voice, especially the bottom end. The bottom is always going to come up on my instruments. It's not that it's not present in the beginning, but it's going to be tight because there is a lot more movement and change in that part of the structural tone than there is in the treble. Without exception I like the guitars better after time has passed. The more they are played, the quicker it happens, so for the people playing regularly it's still happening. It's really fun for me because I can't say that I can remember every individual sound, but I do remember the experience, I remember the feeling, I remember the overall "Is this bright, mellow or..." impression. There have been times when I first strung up a guitar and thought "oh man, I think I blew it on this one. It's just not happening". Traditionally I go sit out on the porch and play for couple of hours and break it in and they always come around. Then there are times when I string it up and the magic is there right away! They still open up and change and grow and mature. I think if anybody gets a really high end instrument and they expect big changes, really big changes in less than a couple of years they are probably not thinking clearly or they just don't have

the experience. Because I do think that in general it takes a couple of years for an instrument to really blossom. You get a really great sounding instrument new and you record it. Then, if you record it in a couple of years, there is going to be such a smoother sophistication to the tone and there will be more breath to the tone, more aliveness. I think I can judge where one of my new guitars is going because I've listened to so many of them change over the years. It has to have all the stuff that tickles your ear right out of the chute or it's not going to be a great guitar. I think that's one of the things that an old guitar has over a new guitar. We can't get 30 or 50 years of play on them in a year! You have to play them. The drying of the cells of the wood, the solvents in the finishes, the glues, getting the moisture out of all of that stuff, you get all of that going on the playing field and then you have the whole vibration thing happening. Is the plate being vibrated or is the whole instrument being used and driven? I've had a few experiences with an older guitar. I was down at Frank Ford's place where they had a lot of guitars in for repair and they had some old guitars that sounded good in the key of D and that was it! What I surmised out of that and learned from opinions was that instrument was probably played in the key of D. Somebody sang all their songs in D and that instrument is just as alive as can be in that key. So I think it's real important to play a guitar across the board. Change the keys, capo it on the first fret, capo it on the fourth fret, put it somewhere you don't normally put it. With bluegrass, which is what I play, everything is in A or E, D and you can get stuck in those keys pretty fast and so I noodle all over the place and I think that has an effect on an instrument.

What's your current waiting list?

It's between four and four-and-a-half years. It depends on what actually gets built. If I build 7 guitars a year, I have 32 on the books. If I guarantee myself 7 a year then I'm 4½ years out. I have 9 months of the year that I'm building and the goal is that I'm trying to get to one a month. So, right now, I'm trying to build 8. It's just gotta be right. I can't have a guitar out there if it isn't right, so if I blow the guitar I just redo it. All my customers know that once they get on the list it will be approximate and that when it's their turn they get absolutely 100% of everything. It'll take whatever it takes for me to get it right for them. I had an accident on one, which put me back 5 weeks. When I called the guy my biggest worry was that he had waited 4½ years and he's chomping at the bit to get it and that I've blown it! But he said, "It's OK as long as it's right". My customer base is as good as you get. They are all willing to wait and so far, knock on wood, I've never had one rejected and I've never had any custom order customer resell their instrument except a really good friend of mine that I just knew when I was building it for him that it was going to happen and it did. And it was really great for him because when he did sell the instrument he almost doubled his money. He wanted to go see his master in India, so he was able to get all of his money back and then have enough to do his thing. I knew that was coming 4 or 5 years ago. So, he's the only one that I've custom built for that I'm aware of that has sold his instrument. The great Larry Keel had one of mine and he was nuts about it. In fact he won 2 and he ended up selling them. It's a lot of money and professional players don't want to take them on the road. The same thing happened to Peter McLaughlin. He said his second favorite guitar on the planet was a Shanti and he sold it! But, the guy that bought it is nuts about it. I'm so happy for him to be the caretaker. He's really playing it a lot and Peter wasn't. Peter is always playing the '42 D-18 that his brother got for him. His favorite one—the herringbone—stays in his safe. I don't blame him; it's too valuable to take out.

What do you require as a deposit to order one of your guitars?

I sell slots for the current price. They cost \$1000 and you own the next slot on the list and you own these prices. So, if something happens in 4 years you can sell that slot so somebody can get a Shanti now at 4 year old prices. Currently, I'm building at a \$4500 base price, but I've been selling slots at a \$7500 base price for the past 1 ½ years. So, if you get in now, 4 ½ years down the road the slot price won't be \$7500 or I'm not going to be in business! [Laughter]

So the slot you are currently selling is for a guitar at \$7500.

Yes, \$7500 is the base price and that would be what I do with the dreadnought. It would be purfled, but no custom inlays or German spruce. It would have Sitka. It would have Indian rosewood or mahogany. There's an upgrade for woods and there are upgrades for details, such as if you wanted abalone around the top or a custom inlay then I'd figure out how long it would take then I'd give you a price on the instrument. I do it all by hand.

Do you have a web site?

I don't have one for my guitars, but a friend of mine (Oliver Waitze) has one that includes pictures and info on my guitars. Oliver's web site is:

http://www.oliver-waitze.de/the_fine_art_of_lutherie.htm

You can reach Michael Hornick at 209-795-5299. His address is:

Shanti Guitars

P.O. Box 310

Avery, CA 95224