Fulfilling a long-standing luthiers' tradition, the underside of this Sitka spruce top is signed by its makers, in this case the student and master teacher.

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HEAR ONE, SEE ONE, DO ONE

A beginner builds a world-class guitar

TEXT AND PHOTOGRAPHS BY MIKE BUCHMAN

It was like the moment when new parents are handed their first baby. I was stunned by what I had produced, a gleaming Indian Rosewood and Sitka OM. It was strung up for the first time, culminating six days of intensive labor in a one-on-one class with luthier Robbie O'Brien.

What was a pile of boards and supplies less than a week ago was now a beautiful instrument, vibrating in my hands. I was exhausted and overwhelmed. Like a new parent, I was unsure: What was this creature? How will this relationship grow? If I were to buy a new high-end guitar, I would take months playing dozens of instruments in shops all around before picking the one that best spoke to me. Here I was with a stranger in my hands, in love and wondering where we would take each other.

CLOSING THE LOOP

I've had a hankering to build guitars since I was a kid. As a high school student in the mid-'70s, I built a cherry Appalachian dulcimer from a kit by Black Mountain, hunched over a card table for a long weekend slopping Elmer's glue over pre-cut and pre-bent wood. I didn't play any "real" instruments yet, but the dulcimer was a glorious introduction to making music with my own hands. And building infected me like a virus.

Somehow, I found out about a school in Seattle, now defunct, called the Northwest School of Instrument Design. I could take a year-long program to become a luthier! Alas, the money my mom offered to help pay for college was not available to learn to build musical instruments I could not play. So, the virus receded back into my brain.

Once I finally started learning to play in the 2000s, I built a few cigar box guitars, hunched over the patio table outside the bungalow I share with my wife and daughter. And you know how when you scratch an itch, it just gets itchier?

Fast-forward to 2023. I was mulling over retirement when I stumbled upon Episode 14 of the Luthier on Luthier podcast, in which host Michael Bashkin interviews luthier and teacher Robbie O'Brien. As I listened to Robbie talk about how he took students one-on-one through a full guitar build *in 6 days* in his shop in Parker, Colorado, my face got flush, and I broke out (metaphorically) in a full-bodied rash!

Within a few weeks I was on the schedule to work with Robbie a month after my retirement in early 2025, with a rare chance to close the loop on a long-held dream.

WHIRLWIND ON THE PRAIRIE

Parker is a former western prairie town built around settler agriculture and railroads. About 20 miles southeast of Denver, it's now a booming bedroom community.

O'Brien Guitars is housed in the 1,000-square-foot basement of Robbie's home in a cookie-cutter development. It's a crowded but meticulously thought-out space filled with power tools and workbenches. Clamps of all sizes and shapes hang from the rafters. The smell of wood belies the dust-gathering vacuum tubes that trace the walls. And on the main bench, a stack of East Indian rosewood, Sitka spruce, mahogany, curly maple, and ebony that we will turn into a guitar.

The first three days were a whirlwind of thicknessing boards, trimming and bending sides and binding, gluing top and back plates, installing the rosette, making neck and end blocks and gluing them to the sides, installing kerfing, sanding the box to correct radiuses front and back, roughing out braces, gluing on braces, voicing and shaping braces, closing up the box, installing binding, rough sawing the neck, routing the neck joint, slotting the fretboard, installing the truss rod, creating and installing the end wedge, gluing on the fretboard, carving the neck, inlaying fret markers and side markers, prepping frets, installing frets, and SO MUCH MORE that I can't even remember, let alone cram into this run-on sentence.

It was exhausting and exhilarating!

Robbie has over 20 years of experience building guitars and even more teaching. He describes his primary pedagogy as the "hear one, see one, do one" method. For each step of the build, he would talk me through it, demonstrate the procedure on a portion of the guitar, and set me to work on the rest of the instrument. We used this process for everything from carving the neck with chisels, rasps and a spokeshave to sanding the bridge through a series of five ever-finer grits, tapping in frets, and spreading epoxy into the pores of the rosewood, as well as French polishing the instrument.

Robbie said that within the first 15 minutes, he can assess a student's comfort with tools and the level of oversight he'll need to provide. While he took the lead

Luthier Robbie O'Brien and author Mike Buchman.

on some of the more delicate processes, like thickness sanding, I was a frequent flyer on the bandsaw, drill press and disc sander. And I knew my own limits. I was comfortable with delicately routing rosette channels into the top, but I passed on routing the binding channels where the top and back joined the sides, fearful of the bigger machine and the prospect of catastrophic damage.

Before arriving, I worried about my hand strength. And while I had to shake off a few cramps while using the finger and hand planes, I found my minimal experience and skills up to the tasks under Robbie's close tutelage.

Days four through six were half days focusing on finish sanding, French polishing, shaping and installing the bridge, saddle and nut, putting on the tuners, stringing it, and doing a setup.

We'd break for lunch and a "celebratory cup" of Brazilian coffee each day and shoot the breeze about the build and the state of the world. Both a storyteller and a good listener, Robbie made me feel comfortable and relaxed.

VOICING

With all the focus on building the box, shaping the neck, etc., it would be easy to forget that we were building a musical instrument. If it didn't sound great, it would not matter how it looked!

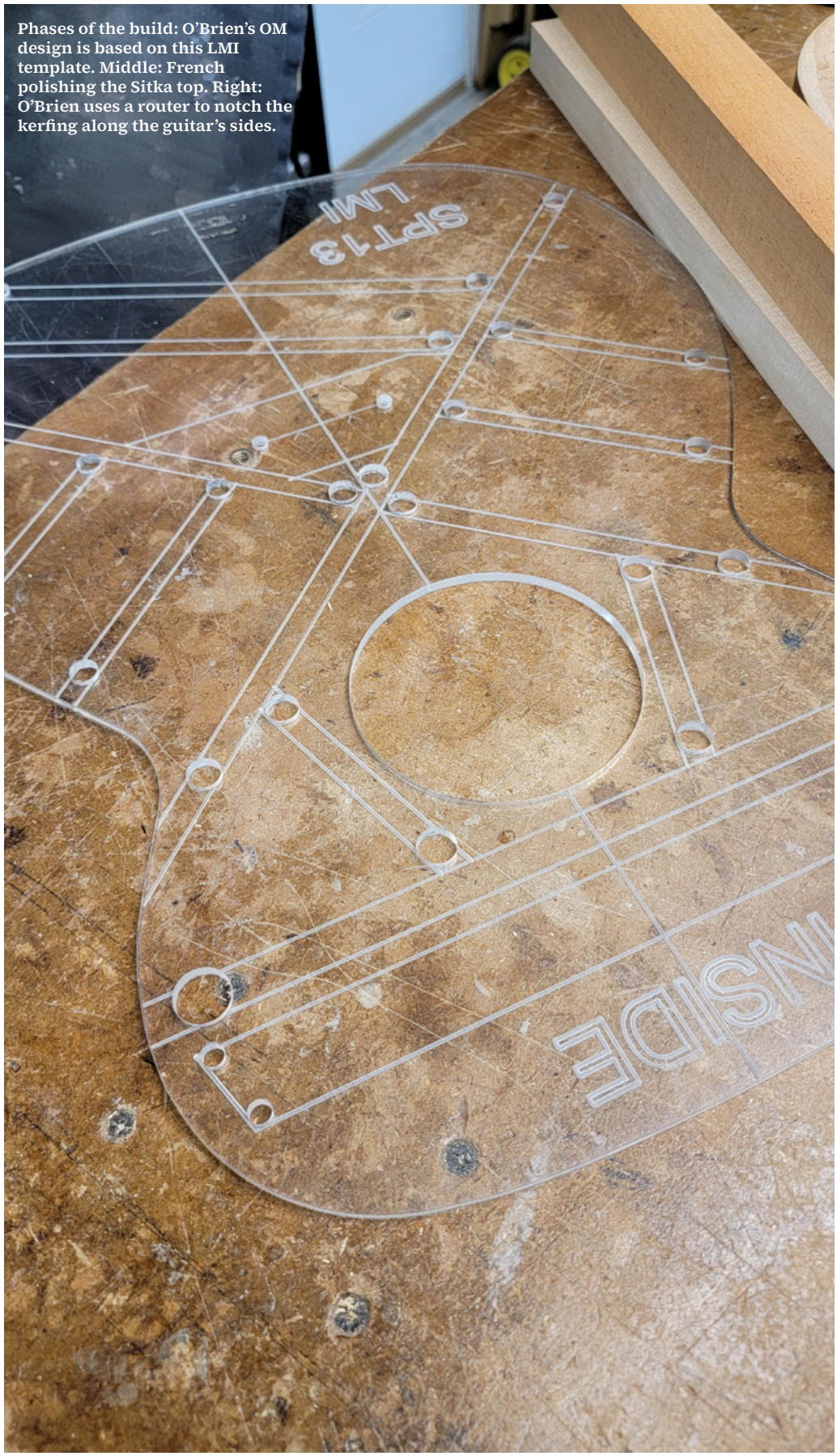
We started talking about the voice of the guitar at the end of day one. Robbie gave me some homework: to describe "what a good guitar sounds like."

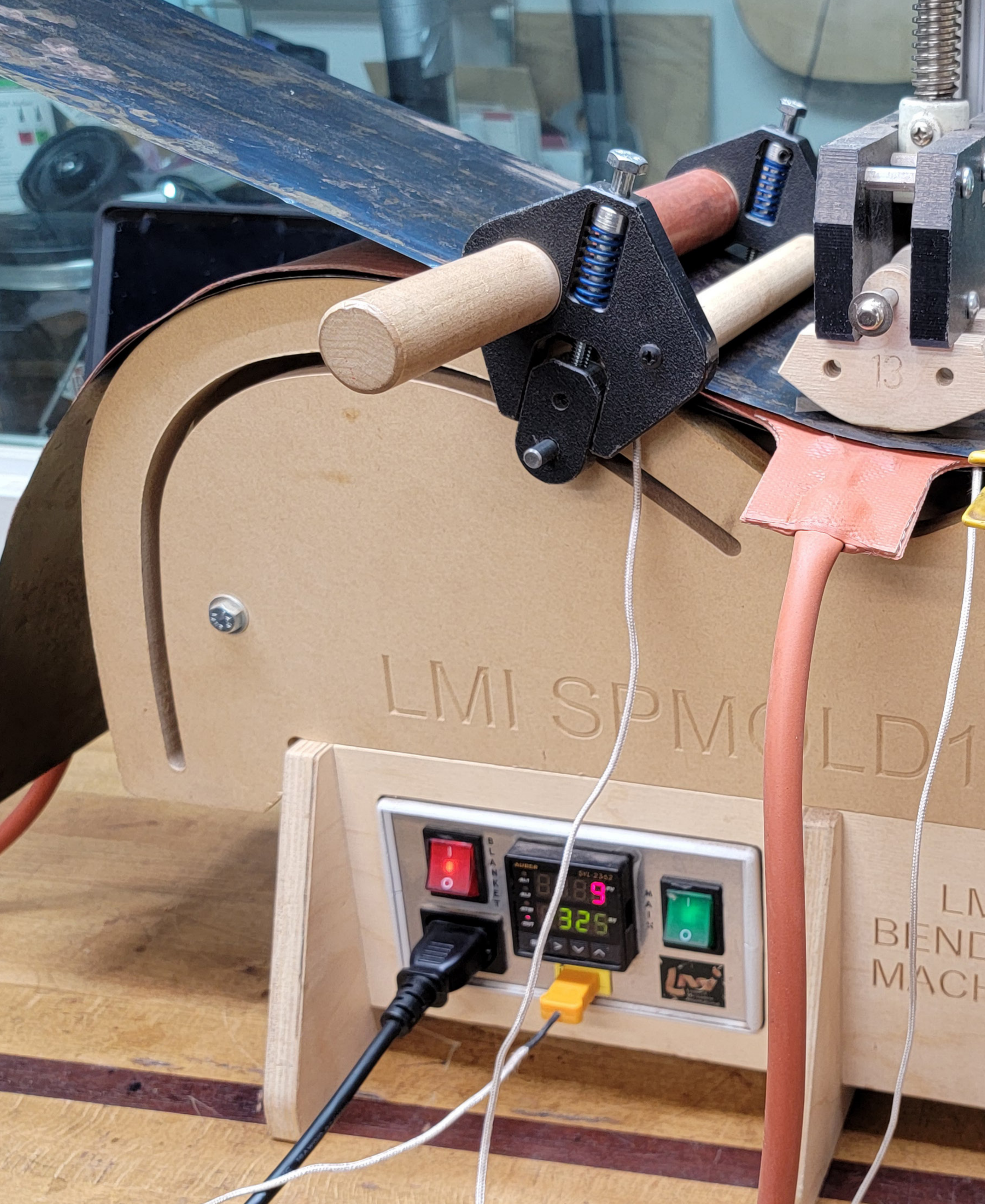
The next morning, I reported back with this list, which reflects my Travis-picking-based fingerstyle playing:

- EVEN ACROSS THE TONAL RANGE
- RICH OVERTONES
- BELL-LIKE TIMBRE
- SPARKLING TREBLES
- BLOOMING BASS
- DYNAMIC HEADROOM

Robbie explained that good sound comes from the interaction of stiffness versus flexibility of the wood, especially the top. Four elements influence the top's stiffness and contribute to its voice: the thickness of

Phases of the build: O'Brien's OM design is based on this LMI template. Middle: French polishing the Sitka top. Right: O'Brien uses a router to notch the kerfing along the guitar's sides.

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LMI SPMOLD1
BLANKET
AUBER
9
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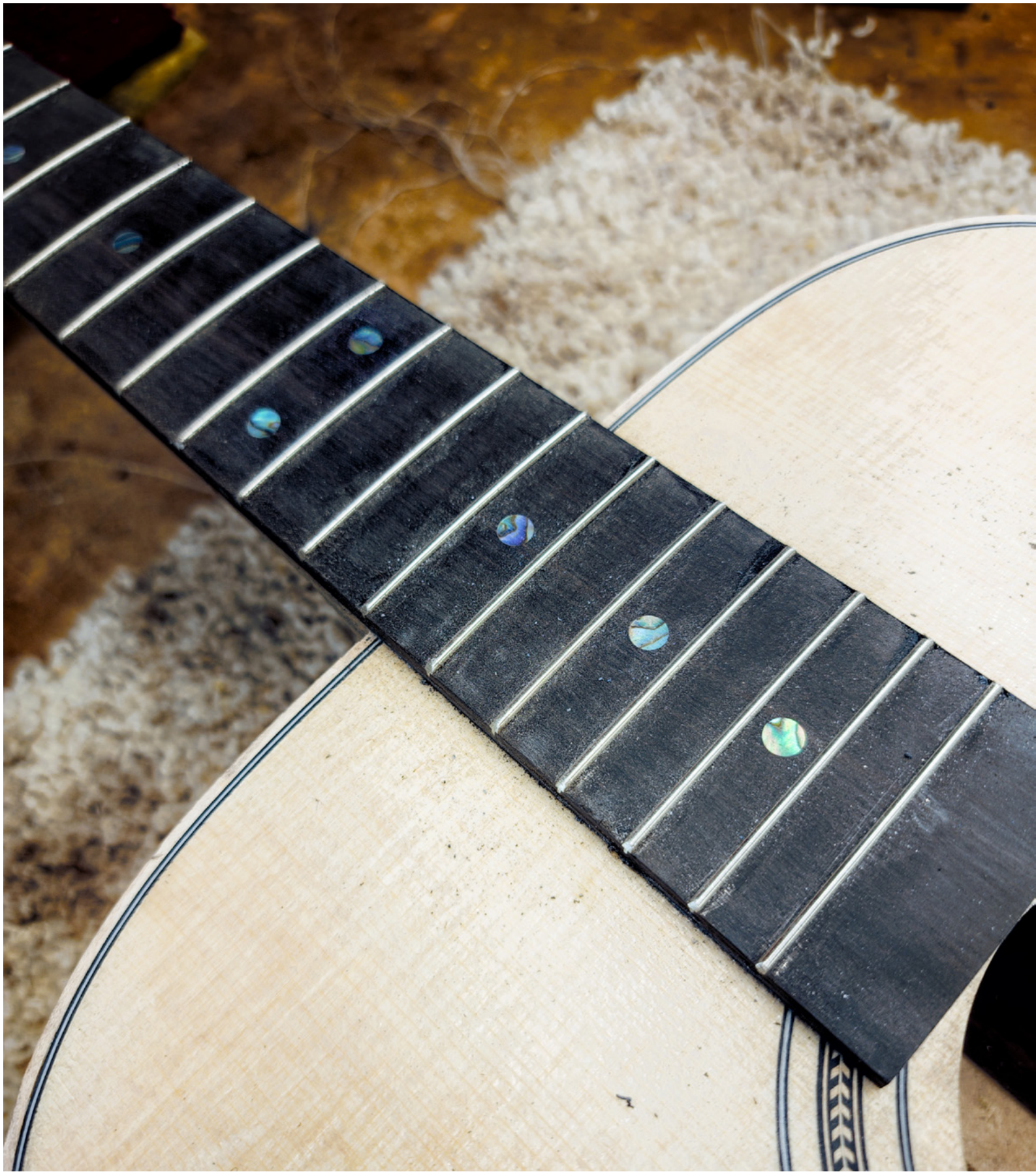
MAIN

Dampened Indian Rosewood sides are encased in a blanket for protection while a metal heating element is clamped against them in the LMI Bending Machine to shape the sides and bindings. The large wooden dowels are rolled down to press the sides into the form.



Building a guitar in six days allows for very little customization, but the author did install abalone position makers on the fretboard in place of the standard mother of pearl.

the wood, bracing, the radius of the top, and shaping the braces (removing mass).

When the top was initially braced with a subtle variation of Martin X-bracing, but before we started shaping the braces, we did our first sound evaluation. This was a subjective auditory test that Robbie learned from luthier Kent Everett called the "flop test." We held the top by the edges along the lower bout and gave it a quick flex, like a stagehand might do to a sheet of metal to make sound effects of thunder for a play. From the first flop you could start to hear the beginnings of a musical "boing."

At that point, the top and braces weighed 261 grams (9.2 ounces).

We shaped the braces into ramps with delicate finger planes, stopping along the way to flop and listen. At each stage, the sound got more musical, with greater resonance, and then a growing sense of reverb. The goal was to stop removing wood when the sound stopped getting better. As we worked on the top, the musicality of the flop test suggested this would be a great-sounding instrument. When we stopped, the top weighed 241 grams (8.5 ounces).

We also used a more data-driven approach to voice the instrument.

Australian luthier Trevor Gore has done extensive research measuring the frequency response of acoustic guitars, which has resulted in a set of target mode frequencies for steel-string guitars played fingerstyle or strummed, classical guitars, etc.

Starting when the box of the guitar was first closed up (without bindings), and again at five subsequent stages of the process, we recorded the tones from tapping on the top adjacent to the bridge and ran them through a computer program that gave us frequency response data for the top, back, and overall box.

Gore offers a few idealized targets that will produce great-sounding instruments, in part by avoiding scale tones that can become wolf notes and by achieving an impedance mismatch between the top and back/sides so that tone is not sucked out of the top.

Our testing showed the numbers were moving towards Gore's holy grails. But the more visceral signpost to the future of this guitar came during our preparations for finishing. Robbie used a handheld power sander on the guitar's sides. As he rounded the lower bout, the instrument, excited by the vibrations of the sander, sang out through the sound hole like the full-throated voice of God.

MAKING OF A TEACHER

Robbie's guitar-building started in Sao Paolo, Brazil, in 1997. Trained as a classical guitarist, he was working as an ESL instructor when the lutherie bug bit him. While living in a small studio apartment with his wife, Adrianna, he began learning the art of guitar making from Brazilian luthier Antonio Tessarin. Every Saturday he and Adrianna would haul boxes of wood and tools over two subway rides and a mile-long walk to get to Antonio's shop and continue his education.

Years later, when the family moved back to the United States, Robbie applied to take a furniture-building program at Red Rocks Community College. He brought a guitar he had made to the admissions interview, and upon pulling it out of the case, he was offered a job teaching lutherie at the school.

He developed an 18-week curriculum, grew the luthier program from a handful of students to over 100 per semester, and was promoted to head the entire woodworking department at the school. Eventually the administrative burdens wore on him, and he left to work with students one-on-one in his home shop.

Initially the class was 10 days long, but over time he whittled it down to six.

"You do the same thing for a thousand guitars, and you learn to get pretty efficient at it," Robbie told me. "And then I slowly acquired more tools, dedicated tools. You know, you go to the drawer and pull the router out. It's already set up, ready to go for that particular step."

To date, Robbie has helped over 1,000 people make guitars.

"Each student comes with their own challenges," he said in the Luthier on Luthier podcast. "On the surface, we are building guitars. It is much more than that. A lot of people go away happier than how they arrived in my shop…My job is not only to send them home with a good guitar; my job is to send them home with a good experience and a more positive outlook on life."

Many of Robbie's students want even more than an experience; they are hoping to inform an ongoing practice of guitar making. For me, the singular experience was overwhelming enough! I could not imagine trying to remember all the details. For those who want to continue building and learning at home, Robbie has hundreds of hours of online coursework available for purchase at lutherieacademy.com, including an almost real-time recap of the six-day steel-string and classical guitar classes.

Sanding down rasp marks on the heel of the neck. O'Brien's process involves carving and sanding the neck after it is attached to the body.

HOW'S THE GUITAR?

In one of the final steps before stringing up the guitar, we glued in a custom label: "Handcrafted by Mike Buchman at O'Brien Guitars." So, how much was done by my hands versus Robbie's?

It is tough to estimate, but pretty close to 50/50. Some processes were all Robbie (thicknessing the wood, routing the neck joint), and some mostly me (sawing the fret slots, drilling tuner holes and installing the tuners). Others were equally shared (French polish). There was very little that I didn't have a hand in.

The most obvious evidence of my work is the shape of the neck, which perfectly fits my hand, and the telltale rasp marks that I did not fully sand out, where the heel transitions to the neck. I could describe other small mistakes in intimate detail. The downside of completing an instrument in six days? The fact that I'm a "good enough" kind of guy? Probably both. None of them compromise the quality of the sound or playability! They are more akin to the imperfections left in a Persian rug to prove it was made by human hands.

Sometimes Robbie would fix my mistakes or cover my inadequacies. His practiced eyes would spot issues I did not. His hands would "see the wood" in ways that were blind to mine.

The class was a profoundly sensual experience: the chatter of scrapers and planes, the throat-clearing of rasps, the scratching of sandpaper, the whooshing of French polish pads. The smell of bone being sanded, epoxy filler, and alcohol-based shellac being rubbed in. The slow reveal of silking in the top. The tease of red and green streaks in the back and sides. The reflections that shined brighter as we layered the finish. The taste of sawdust, the feel of it embedded in my hair and my shirts.

And finally, Saturday late morning, the moment I'd been thinking about for almost two years was at hand; the build was complete, the finish polished. The guitar was strung and set up for easy playing. Robbie handed it to me and said, "Go ahead, take her for a spin!" **FJ**