

# Nouveau Series Guitars

by Michael Spalt

I STUDIED ART in college, and then worked for years in the film industry. I started making guitars as a hobby, something that harkened back to teenage years when my friends and I would customize our electric guitars to increase their cool factor and optimize their performance. Since then I've followed the same self-teaching path as most fledgling guitar builders, learning traditional methods along the way, and gleaning whatever information I could from any available source. Doing repairs allowed me to familiarize myself with various designs and construction methods, and their advantages or problems. Eventually making guitars became a full-time occupation.

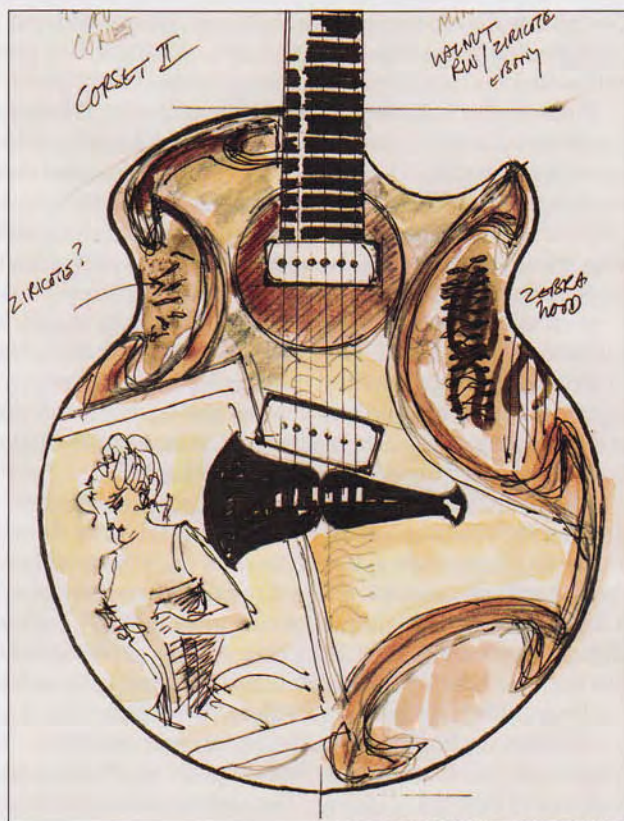
My father was an architect, and dean of the Academy of Applied Arts in Vienna, where he also taught. He used to rail against the organizers of rock concerts who booked the great classical concert halls in Vienna where I grew up. His contention was that the "noise" coming from the speakers would destroy the acoustics of these halls — acoustics which had been tuned and dialed in over the decades through countless concerts and performances of classical masterpieces by the greatest performers. As a teenager, I found his remarks dismissing the serious and world-shaking importance of contemporary rock, jazz, and fusion music to be rather silly.

Another run-in with this kind of thinking was a statement by my high school music teacher against any amplified music: "What comes out of a speaker could not possibly be music. It is a parody, lacking all the overtones and subtleties a real instrument produces." Again I chalked it up to the cultural snobbery of "old people" who did not understand the fire and passion engendered by contemporary popular music.

It was many years before I began to understand what my father and my music teacher were talking about. The first inkling came when I loaned my old Martin D-28 to a friend, an accomplished player, for a while. It came back sounding different — better somehow. I couldn't put my finger on it, but it alerted me to the phenomenon.

Now, more than a decade into my career as guitar and bass builder, the concepts and observations of my father and music teacher have become clearer and have been bolstered by experience. Instruments will change their tone when placed in the hands of different musicians. It might border on the esoteric, but I do believe that even a concert hall may undergo subtle acoustic changes when exposed to a radically different sound. And it seems by now a well-accepted opinion that instruments need to be played, to experience the sound vibrations traveling through them, in order to find their tone. Paul Schmidt has a nice way of putting it: "The guitar doesn't yet know it is a guitar. It needs to figure it out."

Part of what makes this job so interesting is the moment when you really find out what the instrument sounds like, beyond all the tapping and grading. There is always a surprise in store. As we progress, what we've heard before will influence how we listen. It's interactive and prone to change over time. Isolating what



ALL BY MICHAEL SPALT EXCEPT AS NOTED



Michael Spalt's Nouveau Series of thirteen electric guitars, with shapes based on Steve Klein designs, was commissioned by Paul Schmidt. Each instrument is named and designated with a number from N1 through N13. On these two pages you see three steps in the process of making N1, Boutet Corset, which features a print by Henri Boutet. Top: A sketch plays with color combinations. Above: Working from a sketch to arrange artwork on an old-growth, aged mahogany back with a rosewood center. Facing page: N1 finished and strung up.

exactly constitutes good tone and how to create instruments which exhibit it is a never-ending process.

Most of the time I spent building, at first very traditional instruments, was also a search, a process of defining what good tone means to me. Some guitars, whether vintage instruments, cheapos of any age, repairs, or my own builds, would have the quality of sound I was looking for, and some would not. I found that vastly different designs, materials, building techniques, and vintage could all produce sounds that would speak to me. I have never been wedded to a particular sound to the exclusion of others. Maybe that is what allowed me to explore materials which do not fit the traditional canon.

I realize that my instruments occupy a middle ground between "art" and "craft" — by their essence unacceptable to traditionalists on either side. However, musical instruments, and especially the guitar, have a long history of doubling as works of art as well as toneful tools of the musician.

I had used clear casting resin to encase found objects placed on a weathered board that had a wonderful texture and color. Since I was making guitars it seemed only natural to make a guitar body this way. I liked the result, and after some experimenting I found a resin formula which worked. The resin needed to retain some flexibility in order to avoid separation from the wood substrate, and it needed to sound good. I traded water clarity for this. The resin I use (*EX-88, from Environmental Technology Inc.*) will yellow lightly, acquiring an amber cast over the years, like aging nitrocellulose lacquer. I'm not sure this is really a drawback; the aging that vintage instruments undergo only adds to their beauty. Using a different type of resin, like an acrylic, would yield a clearer more transparent body, but I have found that a lot of formulas have a negative impact on the tone. With some of them, separations develop over time between the resin and the wood, looking like large bubbles under a sheet of ice.

My idea was not to make a completely resin-bodied instrument, like the Dan Armstrong type. I wanted to retain a wood base and do the "assemblage" on top. The purpose of the resin is to unify and seal in the artwork. The wood serves to retain the structural stability, and it contributes quite a bit to the tonal quality of the instrument. In general I mount the neck directly to the wood back, rout into the resin underneath the bridge, and glue a wood block in place for the bridge to sit on. The Nouveau guitars, for instance, have a mahogany support block in the shape of the bridge but with a somewhat smaller

footprint, which is glued to the back. The bridge sits directly on that, and the strings pass through that block to the back.

In the course of making around 250 resin-top instruments over the past dozen years I have learned to work in thin layers to avoid the heating which happens when large amounts of resin cure, which leads to irregularities and trapped bubbles. I have found that resin, more so than lacquer, seeps deeply into the wood's pores and fires up the figure of the wood.

Epoxy also does this, and by sealing the wood with a thin coat of epoxy prior to finishing with lacquer, you will be rewarded with enhanced shimmer and deeper luster.

Work a slow-curing epoxy into the grain with a rag and wipe off the excess. Like wood filler, a thin coat will not impact the sound in any noticeable way. It can be lightly sanded, then finished in the standard way.

Resin is heavy, so I keep it to the minimum required by the design of the piece. A lightweight mahogany body with a quartersawn mahogany neck and a Madagascar rosewood fingerboard is one of my favorite configurations right now. The resin top will add some high end and sustain and yield a bit more attack and snap, and the mids will shift a little higher.

I've used both the 25½" and the 24¾" scales to good effect. On a resin top, which employs a bolt-on neck, the shorter scale will retain more clarity and overtones than it would on an all-wood guitar. My personal preference is for the longer scale, and I often use that on set-neck, all-wood guitars. I guess it is the same preference I have for a clearer tone that makes me like mini-humbuckers and Gretsch-type pickups in the neck position.

The genesis of the Nouveau Series was a guitar I made for Henry Kaiser. He showed it to Paul Schmidt, who, along with Steve Klein, was curating an exhibit of guitars at the Sonoma Museum of Art. Paul asked me to send him some guitars for the show. This led to Paul commissioning the "Klein Downtown" guitar, a solidbody based on a Steve Klein acoustic shape that would include parts from Klein's shop. Among them was a Klein neck, which I fit with Rodgers sterling silver tuners, and a Klein ebony bridge, which I modified for through-the-body stringing. We used Fralin Jazz bar pickups, and I aged the covers to match the aesthetics of the design. The guitar was completed in 2003.

Paul asked me if I would do a series of twelve guitars along the same lines as the Klein Downtown, but using Art Nouveau glass and prints. As is often the case with art projects, the





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financing was the first and main hurdle. We received some seed money from Mike Welden, Paul's partner in the "Art of Music" project ([www.artofmusicinstruments.com](http://www.artofmusicinstruments.com)). I worked out a budget and time line, but both unfortunately proved to be wildly unrealistic. In the end I made fourteen guitars; one prototype, the twelve guitars of the series, and a 12-string that Paul ordered as a personal guitar.

The design process has a guitar aspect and an art aspect. Though they are interdependent to some extent, each has specific needs, and successfully combining them was the challenge. I actually like working within a set of parameters — struggling against an obstacle creates a friction in the creative process which I find stimulating. Paul and I selected the art and divided it up into groups so that each guitar would have a theme, along with a color scheme based on the art used. We had a few artifacts left from the Klein Downtown, small decorative pieces of pearl and ebony, which I used along with the Nouveau art — they meshed very well.

Once the features of the instruments were determined, the basic layout was designed. I made a blank sketch of the guitar outline with bridge, neck, and pickup drawn in, and printed a bunch of them out. I had to be sure that the critical areas of the neck pocket, the bridge base, and the areas above the electronics cavity and the pickup routs remained workable; no glass or metal could be placed in areas that would later be routed. Starting with the selections I had previously made with Paul, I roughly positioned the art and assigned pickup colors by drawing and painting on the printed sketches. Some of these designs are pretty close to what the finished instrument looks like while others are more general roadmaps which underwent some changes in the building process.

This process helped to determine which woods would work with the given art, and how form and color would set off or combine with the particular art piece. A good example for the approach is N3 (p. 15), vs. N10 (front cover). The rectangular piece of ebony used in N3, a remnant from Klein's workshop, gave rise to a rectilinear design, with the color of the lithograph prompting the use of poplar, while the decorative structure of the glass used in N10 suggested something like spiderwebbing to me, leading to the use of highly textured/figured woods like

spalted maple and decayed koa, shaped using a vocabulary of spiderish forms. Another example is N7 (*Tiffany Bon-Bon*, back cover), where the shape of the glass prompts the shape of the inlays and a flowing, curvilinear approach to the wood form, while taking the golden sheen of the glass as cue to the use of yellow wood and yellow pickups.

I was lucky to be able to purchase the wood for the series from a retired dealer who had it in storage since at least the '70s. There was some very nice dark Indian rosewood for the necks and the center sections of the backs of the bodies, and some beautifully figured Honduran mahogany for the backs.

The center section of the back of each body follows the same taper as the neck, getting wider towards the bottom end. I laminated veneer stripes between the center section and the mahogany wings. Grooves cut into the sides of the center section and the mahogany wings grip padauk or purpleheart stringers which reinforce the joint and create colored diamond shapes where the carve of the body intersects them.

I wanted the necks to be identical. I had acquired a CNC in the belief that it would speed up things around the shop, but found that the learning curve, and the fact that I rarely repeat standardized tasks aside from the headstock inlay and truss rod routing, rendered it a bit of a white elephant. Luckily I came across a very knowledgeable machinist, Michael Stevenson (he worked at Warmoth last I heard), who instructed me and also designed the program to carve the neck blanks for the Series on the CNC. The rosewood blanks were squared and the headstock glued to them by means of a scarf joint. A colored veneer, to match the color scheme of the given guitar, was laminated onto the face of the neck and headstock plate, then the headstock plate was glued on. The truss rod channel was carved, and the access hole for the wrench was drilled through the headstock plate. The resulting blank was then placed on a fixture on the CNC and carved. After installing the two-way truss rods I glued on the ebony fingerboards. The edges were trimmed and sanded and the fingerboards radiused. I installed sterling-silver side dots in some necks, or dots made of sterling-silver tube with an abalone or pearl dot inlaid, in other necks. After this the necks were laid aside, as it turned out for quite a while longer than anticipated.



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*Facing page, top left: Paul Schmidt, left, and Michael Spalt sorting the art. Facing page, top right: Mahogany bodies have rosewood center sections keyed with stringers of padauk or purpleheart. This page, top left: Rosewood neck blanks ready for the truss rods. Top, right: Neck shaping on a CNC. Middle, right: Shaped necks with fingerboards glued on. Bottom, left: Starting to cut out and shape the decorative woodwork for N1. Bottom, right: Gluing the decorative pieces to the back for N1.*

When the backs were glued up they were surfaced and the outlines were roughly shaped. Then the rosewood neck-block/ faux rosette and the mahogany bridge-support block were glued on. The Indian rosewood rosette is set off by a matching veneer. I realized after a while that it would have been much better to leave the bridge block off and to rout for it using a template after the decorative wood pieces were glued on. Instead I had to shape a lot of them so they would fit around the bridge block — redundant and tedious work.

Besides the art work, most of the decoration material was wood selected for color and texture to match the aesthetic theme for each guitar. The wood was cut from thickened boards, starting with the major pieces and then fitting the others around them. Working this way, I can utilize much of what anyone else would end up throwing away.

I didn't use templates for marking or cutting the shapes of the decorative wood pieces except in one or two instances. Rather, I placed a shaped piece on top of the board from which I would cut the adjacent piece of wood, and traced the outline directly onto the board. I did not want a perfect CNC-type fit. To me there is something lifeless in fitting different woods so precisely. In any case the seams between the pieces are then filled with resin, so there is no problem with voids.





Piecing decorative wood for N11, Loetz Gilded Serpent, which will feature 19th-century glass by Johann Loetz.



N13, Gallé Floral, features an etched glass lid by Émile Gallé, inset to transmit light.



Gold leaf background for glass on Tiffany Prototype prior to first resin coat.



Fitting the decorative wood pieces and glass for N7, Tiffany Bon-Bon.



Prepping body for N4, Lautrec Yvette for the first coat of resin. N4 will feature a print by Henri de Toulouse-Lautrec.

Once the decorative wood pieces had been shaped, formed, and glued to the body back, the outline of the body was sanded smooth to within  $\frac{1}{8}$ " or so of the final shape. At this point I applied gold leaf to some areas on some instruments to provide a good reflecting background for objects.

The next step was to apply the first coats of resin. This step is tricky, because some woods tend to expel gas, which gets trapped in the resin as bubbles. Thin coats, each with a day's worth of curing time, have to be applied. I used quite a bit of spalted maple, which is especially porous and takes a few coats to seal and build up to where the resin creates a uniform surface.

I had built a "resin box" ventilated by a fan pushing air through a filter to create a dust-free stream of air, which prevents dust particles from floating in and settling on the resin as it cures. The box fits two bodies, and while dust is not really a problem for the initial coats, it is always preferable to use the box. So I was mostly limited to one coat per two bodies per day. Some bodies needed ten or fifteen coats, and there were fourteen bodies.

I applied a strip of paper masking tape around each body, creating a sort of basin into which I could pour the resin, building it up in thin layers around the art objects. The lithographs were sealed with white



Coating the body of Tiffany Prototype.



Resin covered sanded body blank for N1.



Installing flower inlays on the sanded blank for Tiffany Prototype.



Above: Final resin coat on body blank for Tiffany Prototype, with glass and inlays. Below: Final coat on blank for N11, Loetz Gilded Serpent.

glue to prevent the resin from seeping into the paper and creating "grease spots." Depending on when the objects are placed between the resin layers they can seem to float. Once the resin had reached the top, becoming flush with the wood pieces or art, I peeled the tape off. The result is a cohesive block which, after being sanded to the specified thickness and having the edges sanded to the final dimensions, is much the same as a regular wooden guitar blank, ready for routing and shaping. Sometimes the decorative wood pieces are also sanded down along with the surplus resin in this process. The final visible wood surface, whether it is the top layer, or a lower submerged layer, has to be fine-sanded, preferably down to 600 grit or so, before the final coat of resin. The resin will show any sanding marks.

If there was inlay to be done on the body it was done at this stage. The next step was to rout for the neck pocket, the pickups, the bridge cavity etc. The body contours were then shaped. I fit each neck to the appropriate guitar, drilling for and fitting the inserts, along with the bridge cavity insert.

The "rosette" provides lateral stability, creating a wood pocket for the neck to sit in. My measure for the tightness of the fit was the ability to vigorously handle the guitar without the neck slipping

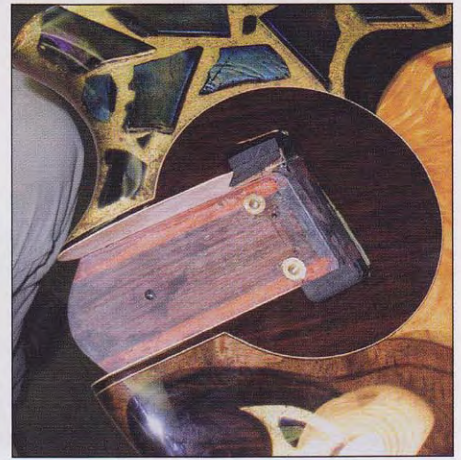
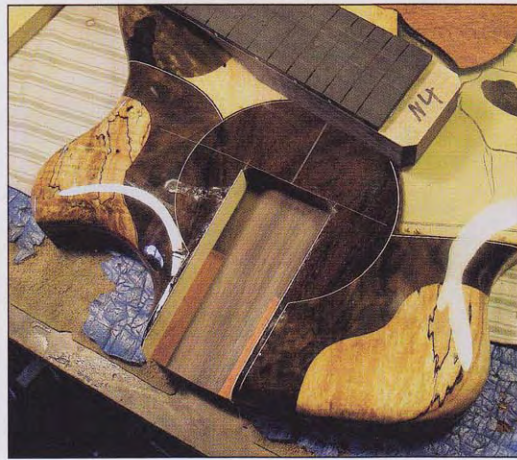
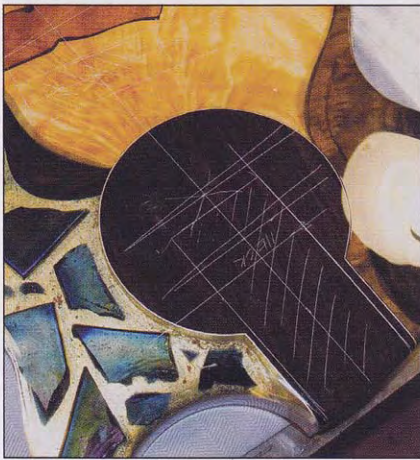




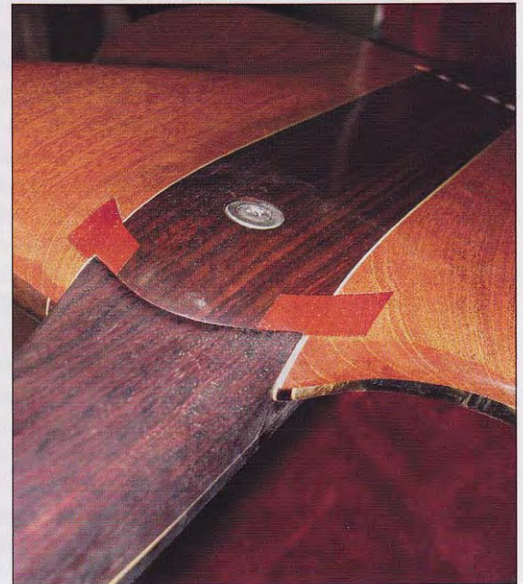
View of a back. The resin drips around the edge are visible.

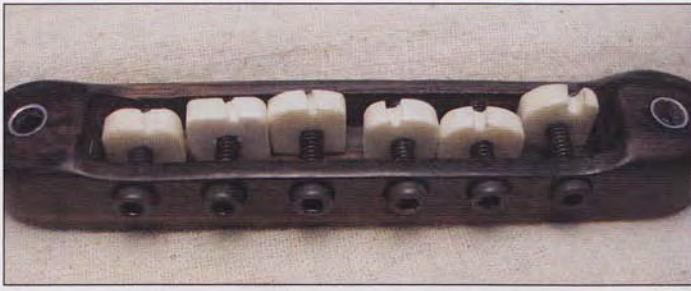


Shaping a back. The contours expose the stringers that key the mahogany to the rosewood.



Middle, left: The neck pocket is laid out. The resin can be marked with a scribe. The scratches will disappear with the next coat. Center: The neck pocket is cut. Middle, right: Inserts for the two inside neck bolts. Bottom, left: Spider inlay in neck for N10, Spinning Arachnid. Bottom, center: The pickup cavities and bridge placement are scribed and routed in N1. Note the bolt holes in the upper end of the neck. Bottom, right: Contoured body with neck attached showing the single visible neck bolt in the three-bolt system.





Custom "Tune-O-Matic" style bridge fits into a recess in a "bridge surround" that is styled after Steve Klein's acoustic bridge design.



Completed bridge surrounds.



Bridge surround set into wet resin on Tiffany Prototype.



A bridge surround is laid out on N5, Tiffany Scarab.

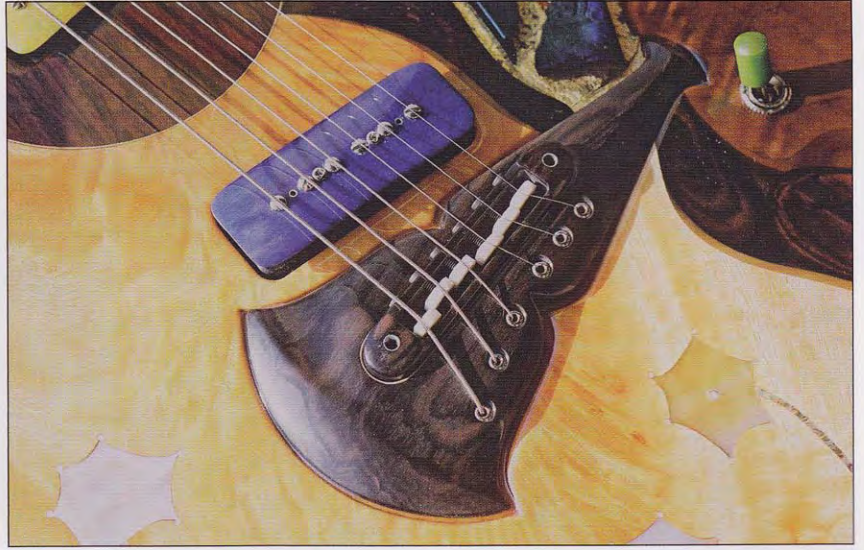


A bridge surround is fitted on N4, Lautrec Yvette.

out, even though it wasn't bolted on. The neck extends all the way under the pickup, in a so-called long tenon-type design. The resin-top process necessitates a bolt-on neck, but I wanted to make it as sleek and pleasing as possible. It is a three-point bolt-on design, with only the one bolt in back visible. That is a machine bolt which threads through the body into an insert in the neck. I wanted to avoid any chance of tear-out and also be able to apply enough pressure. Two smaller machine screws under the pickup thread into inserts in the body. Once the neck was on the guitar, the whole thing was sanded and smoothed.

In the course of making the prototype I had experimented with various bridge designs. Each guitar would have a bridge surround glued to the body, styled after Steve Klein's acoustic bridge design. But since adjustability for action and intonation is a must for an electric guitar, I designed a variation on the Tune-O-Matic bridge to take the place of a static saddle, making the bridge body out of wood which matched the appropriate surround, with bone saddles held in place by the adjusting screws. The bridge sits on two flat-head hex bolts, which in turn thread into inserts at the bottom of the bridge cavity rout. The bridge and the cavity are fitted snugly, to allow for up and down movement but no rattle or sway. The bridge height can be adjusted via a hex wrench inserted through small holes in the top of the bridge.





All routing and shaping must be done before the last resin coat is applied to the top of the body. I use the resin itself as the final finish coat. I don't quite trust that lacquer or some other finish would adhere well enough. My bodies are not encased completely — the final resin topcoat flows over the edges of the piece, and there is a transition to where the wood on the back remains bare, to be finished with lacquer, or in the case of the Nouveau Series, with oil.

This last coat of resin is critical, since it constitutes the final surface of the top. Any mistake at this point and it has to be sanded off and the process repeated. In this case I had the complication of fitting the bridge surround into the wet resin,

so it would become part of the body. I had made the bridge surrounds and glued in a skirt of veneer that would slide snugly into the bridge cavity, registering the surround along with the string-through ferrules in the proper position. Once the body was coated I slid the surround's skirt into the bridge cavity and weighted it down with a chunk of metal to glue it into place. A few times the final coat didn't pass muster, so I had to sand it off along with the surround, and re-rout, reshape, make a new surround, etc. One guitar in particular went through three such cycles!

The strings pass over the bridge, through ferrules in the surround, and from there through the body to retainers in the back. In order to provide a ground connection, I soldered a ground wire along the bottom of the bridge to the base of the ferrules. The wire sits in a channel under the bridge and passes from there into the electronics cavity in the back.

The last steps are sanding and finishing the back and then assembling the instrument. The necks were fretted, tuners fitted, and the nut installed. I used a zero fret, following Klein's lead. A trick Patrice Vigier showed me, making the zero fret removable, is good insurance against grooves developing in the fret, and also helps in case of a fret dress. Even though the zero fret theoretically can be the same height as the other frets, people seem to strum or pick open notes harder, so it helps if the zero fret is a size taller than the others.

For the Nouveau Series, I developed my line of BoneTop pickups. I've always liked P-90s. To me they are the best sounding design. I had worked with dyed bone as material for the nuts and wanted to design some pickups



Top, left: Marking for saddle pieces. Top, right: Finished bridge. Above: While the tops of the Nouveau guitars were coated with resin, the backs were finished with Formby's tung oil after being shaped and sanded. A mixture of two parts gloss oil and three parts semigloss was used.

N2  
*Pissarro in the Field*



N3  
*L'image Profile*



N4  
*Lautrec Yvette*



N5  
*Tiffany Scarab*



N6  
*Mucha December*



N8  
*Mucha La Plume*



to match the tops of my guitars. I made some bobbins, using the colored bone, and sent them to Lindy Fralin. We discussed various parameters and he sent me some samples. Finally we decided on a smaller design with ceramic magnets for the neck position, and a slightly larger one with Alnico magnets for the bridge position. Lindy has wound all my BoneTop pickups. I'm very happy with the results both sonically and as a visual complement to the guitars.

I use 300k pots for the BoneTops, along with Hovland caps for the Series. I came across some older Gibsons and discovered they had used 300k pots for their P-90 guitars. To me they have just the right timbre, better than 500k pots.

I had collected vintage knobs for the Series, so we had to fit those. In some instances we had to fabricate knobs. I had acquired a rod of Catalin, a pre-plastic material of great color and beauty, so we turned a few of the needed knobs out of that.

I also had custom cases made. I wanted to use fabric to cover them, but the case maker could not work with that since they use vinyl and a glue which would seep through the fabric. So we used spray-on glue with the fabric, and the case maker

finished them off with a fitted interior and leather trim.

At the end it was a mad rush, since I was closing down my shop and moving to Europe. This time the deadline was ironclad, and I was lucky to have my friend Andreas Pichler (of Andreas Guitars) jump in and help with the assembly, setup, and general finishing work. Paul Schmidt and Mike Welden picked the guitars up the morning of our flight to Europe, literally at the last moment.

Andreas designed a book with text by Paul Schmidt, and photos by Nicholas Cope and me to document the series (*The Nouveau Series*, limited edition available through [artofmusicinstruments.com](http://artofmusicinstruments.com)). There was an exhibit of the entire Series at the Museum of Making Music in San Diego from October, 2010 through the end of January, 2011.

Vienna, Austria, where I grew up and where I am based now, is awash with Nouveau Art. In a way these guitars are the product of a cultural synthesis, of melding the American-originated electric guitar with the European Art Nouveau sensibility. The Nouveau Series became the final and fitting accomplishment of my "Los Angeles period." —

