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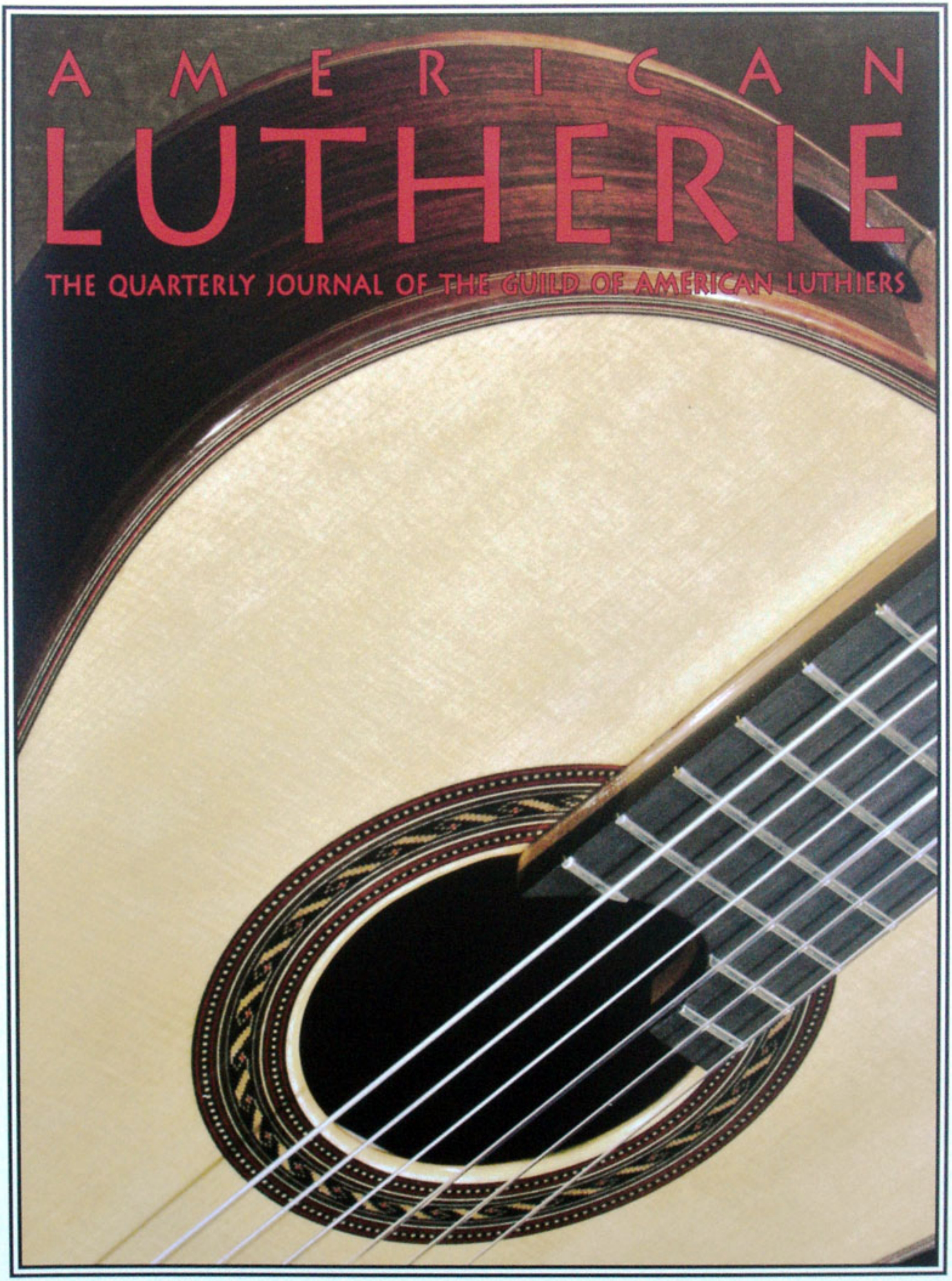

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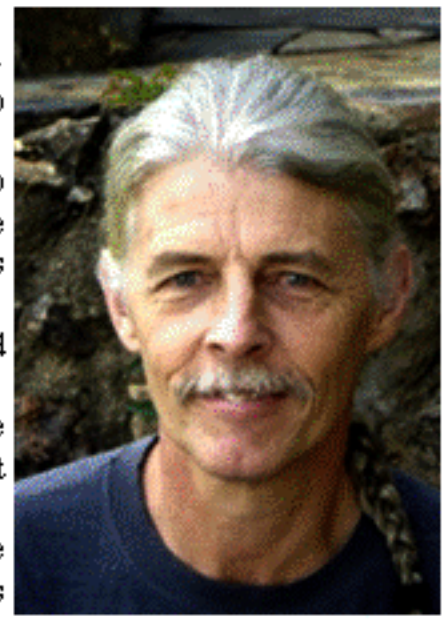
Meet the Maker: **Mervyn Davis** By Rodney Stedall

I First met Mervyn in 1998 at his old farm shed workshop in the countryside just outside Pretoria. I had just started my first instrument and had a need to ask questions of someone with experience in building stringed instruments. I found Mervyn to be a deep thinker, very knowledgeable and willing to share with me the answers to my questions. Mervyn's knowledge and insight into stringed instruments stem from many
Years of self-inspired building and innovation. Most South African builders like myself can claim to have gone through the Mervyn Davis school at some stage of their building career. The interview below serves to prove Mervyn's willingness to share his years of experience with others.



Mervyn, you have thirty years of stringed instrument building experience. Can you tell us what instruments you have made?

Guitars, violins, lutes, electrics, arch tops and mandolins of every description. But there are hundreds that I will regretfully never get around to making. My curiosity is still drawing me deeper into the endless well of questions and answers that experimentation offers and which, I am sure, is exactly what got all of us Luthiers into the craft to begin with.

What was your most difficult instrument to make?

Although I started making 'instruments' in primary school, my most difficult instrument was the first full scale classical guitar that I built in 1971 while I was in standard nine. I had never seen any books on the topic and had only pictures to work from. I scaled the measurements from my old Gallo steel string and bent the sides cold around the top and back that had been glued to the neck and end blocks already. I French polished it and swore never again. I finally sold it in a pawn shop to get money to go home for Christmas at the end of my forth year at university.

Your website shows intricate Da Vinci-style diagrams of your unconventional rosette patterns, inlays and guitar designs. Has your study of architecture had an influence on your instrument making?

Architecture is all about designing structures that are functional and aesthetically pleasing. This is exactly what Luthiers do. Other than honing the required skills architecture schools offer the painful opportunity to have ones work criticized on a daily basis until one develops enough distance to be able to see the faults of ones own creation. This is essential for growth. It sets you free.

African-themed inlays by Mervyn Davis: a chameleon slowly negotiates the perimeter of a rosette, and a group of stylized bushmen head out on a hunt.

You presented a lecture entitled "Acoustic Variables in Guitar design" at the South African Luthiers Guild convention last year. Based on your many years of experimentation, what is the most significant variable?

It is difficult to isolate any variable. If I do so in the document we refer to, it is necessary to keep in mind that it is a gross simplification of a complex and integrated system. A minor change to one element sometimes has a great effect, and seemingly big change sometimes does not. In my experience though, I can safely say that it is the soundboard assembly that offers the widest scope for changing sound if not seen in isolation. The experiment must have a reference.

Flattop mandolin

Does anyone assist you in your workshop?

I work alone with one exception only. Debbie, my fiancée, does a lot of finishing for me. She is the first person I have met that does not disturb my thinking when she spends a long time with me in my workshop. She has no experience in craft but she is a natural. When she works on her car's engine, my friends and I sit and drink beer and don't give advice. She always looks good doing it.

Who has been the most influential person in your career as a Luthier?

My dad. He made a mandolin as a prisoner of war in Italy during the Second World War. This story had a profound effect on me as a boy. The first instruments that I made in primary school were mostly mandolins. Dad was an accountant by trade. He grew up as an orphan on a Namaqualand farm with his grandparents. His parents both died when he was very young, but it is told that my grandfather had made violins on the farm. None remain, though. My dad nurtured a passion for the violin his whole life and started building them at retirement. He immediately started experimenting with the tuning of the air chamber. His work concentrated around the fact that Stradivari had built great violins, all of which were tampered with at the time that concert pitch was standardized later. He came up with a fascinating theory that would be well worth publishing. It brings light to some mysteries around the topic.

What happened to the mandolin he made in the war?

He escaped from the camp and the mandolin traveled with him while living in the mountains in Italy where he slept in caves, haystacks and barns. The mandolin was left in one such barn when he had a very close shave with the Germans and nearly got caught.

Tell us about your early years as a South African boy.

I suppose I had a fairly typical childhood for someone who grew up in the country in those days. I spent most of my free time in the veld and on my grandfathers farm. My cousins and I lived in a world somewhere between fantasy and reality, making war in boats on the river, fishing, and hunting with a pellet gun. We used to draw blood on one another regularly during these wars and everyday was finished off with a hiding before supper when we returned home from the veld and our parents discovered what we had done that day. Wonderful, carefree days filled with snakes, birds, riding goats, and the smell of paraffin lamps. My life today is still very similar to that. I'm scared of town.
Like many African boys I made guitars out of petrol cans from a very young age and tried to improve on them each time. They eventually ended up being actual, playable instruments.

What tools did you use on those early instruments?

I used old hand tools belonging to my dad, and they're still my favorites. That shelf is still up in my workshop, complete with the old Phillips radio that my parents bought in 1962. It still plays in my workshop every day. I only got power tools after I had been building full time for some years. My first workshop had no electricity and I used to do my rosettes at night with two backs of candles around the work in a semi-circle. One can do amazing things with simple hand tools. They also allow great flexibility without jigs.

Mervyn's workshop still features the hand tools used by his father, and his parents' forty-five-year-old radio.

Tell me a little about your Smoothtalker® model.

John Williams recorded in the early '70s and I was haunted by the sound on the records. However, when I finally got Carlos Bonell's Fleta into my hands in the '80s, I was disappointed. I realized later that the recorded sound had flattened trebles and removed the boominess from the basses. This is exactly what I have been trying to do. The SmoothTalker idea started around 1988 with an experiment guitar I made for Steve Newman. I tried to go for more sound and more playability. The playability I got by reducing the body size in the upper bout area with the resulting longer neck. This enabled much better access to the top notes. That part was quite simple and really worked well. To get more volume out of the guitar, I considered that there is a limited amount of energy available from the strings, of which a lot goes wasted. One wants to utilize it properly by turning it into sound. I tried to identify areas where this wastage clearly happens in the conventional guitar design, and I came up with the upper bout of the soundboard. Although it is active like every square millimeter of the guitar, I don't consider that area to be very effective in sound production. On the original guitar for Steve, that area became a lot smaller, which is what offered the extra neck access to begin with. In the Smoothtalker I eliminated it completely which left me with an ellipse for the soundboard, covering the lower bouts only. The next step in the evolution of the SmoothTalker was to identify the sides as being wasteful as well. If the sides are flexible, they may also resonate but wont effectively produce sound. I think this is recognized by conventional guitar makers as well. I made them very rigid and massive. The principle can be explained by using the analogy of throwing a tennis ball against a wall; the ball represents the soundboard or the strings. If the wall is flexible, it would absorb most of the energy and the ball would not bounce back effectively. If the wall is stiff and massive, it will absorb very little of the energy and the ball would bounce back. That is the idea of putting the soundboard on a rigid frame; there is no spilling over into the sides.

So your intention is to keep as much energy as possible in the soundboard?

All of it, if I can.

I experimented a lot with the bridge design. I regard the bridge as a strut that connects all the braces inside to form a grid. This grid stiffens the soundboard and drives it. Against this background I decided to 'use a tailpiece design, so that the string tension is handled by the body of the guitar. The soundboard is at rest and under no stress, and the strings basically just float over it. The bridge just connects the two systems.

Top left: steel string model
Top right: 10-string classical
Bottom: Steel-String Smoothtalker bridge in kiaat wood.

You've got a double saddle with a bridge between them. Why have you done this?

The two saddles cancel out any bending movement to either side of the bridge and leave the top in equilibrium. The center piece spaces the strings and is adjustable up and down. This controls the string pressure on the saddles and is useful in balancing the under saddle pickup's response.
Until recently my bridges were made of spruce, but I've decided that a kiaat bridge looks better and adds something to the sound.
Another important aspect is the neck angle. One can play around with different neck angles, pulling the top upwards or pushing it downwards, affecting the efficiency of energy transfer. The movement transferred to the soundboard of a SmoothTalker is all in the vertical plane which is where the soundboard is going to be most effective, like a loudspeaker.

So are you saying that your bridge is predominantly only going up and down?

That's right. This is typical of an instrument with a tailpiece. That leaves the soundboard free to move around and you don't have string tension working against you. The normal rocking motion of a tie bridge is eliminated here.
There is another aspect of bridge movement, however, that provides a critical means of controlling the soundboard's response. The bridge see-saws along its longitudinal axis on a point that slides back and forth toward the bass or treble side, depending on the played or the frequency of the note's. considering this, the stiffness of the bridge and the placement of struts underneath immediately come into play. It can have a profound effect on the modes of vibration in the top.

Have you ever experimented with the up or down pull effect of the strings on the soundboard?

Yes. You get tonal differences. That is a really effective way of manipulating tone and is a whole topic on its own. In my first Smoothtalker I had an acute neck angle (pulling the strings upward) and I still use that in my jazz models. You get a little bit less sustain, a more immediate attack, and the notes don't seem to flow into one another so much. The sound becomes a little like a harp or lute. This is good for counterpoint extended chords, and that sort of thing.

The structural design of these instruments is very different from conventional guitars. How do they sound?

In all my years of experimentation, the most devastating results came with this idea when I significantly reduced the guitar's soundboard and body size while mounting the soundboard on a rigid frame. The sound was dramatically loud, with excellent treble response and loads of overtones, but unplayable due to wolf notes dissonant overtones, and a lack of bass response. I have spent the past seven years trying to put a saddle onto this horse, to solve these problems while keeping the increased volume.
First let me say that in order to talk about what I experienced, I have to oversimplify. I realize that this only forms a small part of the while and may in many cases be specific to my models of experimentation only. I am very aware of the fact that classic models are highly evolved designs, and it would be arrogant to imply huge "improvements" are possible. I would be honored if my work one day became part of a pool of knowledge which may be useful to interpret as they wish.

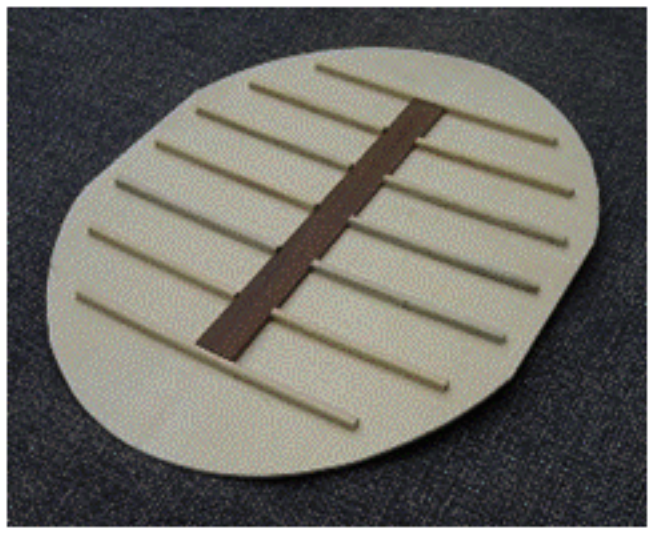
Violin by Mervyn Davis

My experimental model presented me with a number of contradictory qualities. The volume was great except for the wolf notes; the trebles were great but the bass was gone; the note separation was great but some notes did not sustain; and the overtones were great except for the dissonant ones.

I found a new route that took me out of the dilemma. I got rid of the wolf tones by stiffening the top more, right up to the edge, venturing deeper into that terrible treble world. I got the bass back by retaining stiffness in the center of the top when tapering the struts, as a ratio of length, was equal, giving them equal stiffness throughout. I introduced more fundamental into the tone as a tradeoff for higher dissonant overtones by splitting all the struts under the bridge except those at the tips. This dropped the tap tone substantially while bridge movement (impedance) could still be controlled effectively by the bridge size and the stiffness of the struts underneath its tips.

I made a number of deductions as a result of these experiments:

- It is all about energy management. With both volume and tone, one has to take here to add there.
- Reduction in size may increase volume significantly, especially on the treble side of things, and this may require special action to avoid wolf tones. Classical plucked instruments mostly avoid this danger zone by virtue of their size, hence their endearing bass-dominant character. Bowed instruments don't- as a result of the much greater energy input via the bow.
- Impedance control may be exercised effectively at the tips of the bridge and still provide a great range of tonal options (like the wingtips of a bird?)
- Controlling the size of the resonating area at the top by moving stiffness further away or closer to the bridge may manipulate tonal response effectively. Generally speaking, large vibrating areas provide more fundamental and smaller areas more overtones. Surprisingly, though, a small instrument is capable of producing a good bass response.



Smoothtalker soundboard bracing. The braces break under the bridge, except those under the tips of the bridge.

All this saved energy is now available and must be controlled with your strutting to get the maximum sound. The guitars immediately produced a considerable amount more treble response with which I was happy, because my quest was always to get more treble out of the classical guitar. Suddenly I had it, but at the expense of the bass response. It is very much the same as when working on engines. You have to utilize the energy you get from your fuel to a maximum. You cant get beyond that. Then if you want more top end or bottom end power, one is always at the expense of the other. It is exactly the same here with the trebles and basses. I think there is n way of altering either tone or volume without affecting the other.

Were the hundreds of experiments you have done up to now mostly to do with bracing patterns?

Yes and in the end, not so much the layout patterns but the shape of the struts. The critical factor here is the strut size in terms of its length. How do you taper it if you taper it at all? That's how you control the stiffness from the center outwards and also obviously which area of the soundboard is utilized. I try and get it out so that by the time the movement has reached the sides, there is a certain amount of energy left to provide sustain. If you have it too slack, you get wolf tones. They overdrive the soundboard and you get one big movement before you run out of energy. If you have it too stiff, the movement will run over into the sides if they are too flexible. So flexible sides are literally artificially extending the soundboard area to the sides. You can slow everything down, once again with potentially useful consequences.

Soundboard thickness is only really significant in as much as it is affects stiffness. Spruce is so light that I don't think it is necessary to go too thin, as I did in the early days. They became really fragile. Now I am making my tops thicker again, possibly at the expense of some volume.

What spruce do you use? I notice that the tops seem to be made up of several strips glued together.

I mostly use Engelmann nowadays. I have used Oregon, crate planks, South African-grown pine with four rings per inch, and pretty much anything in my experiments. I usually do the standard book matching thing in two halves.

I notice that your top grain runs parallel to the bridge, which is once again a departure from the norm.

I treat the soundboard design as a flat surface, stiffened and reinforced by a system of struts. The primary strut is the bridge which connects a set of secondary struts on the inside of the instrument running

perpendicular to the bridge , into a single framework. The top , by virtue of the parallel grain in spruce, may be seen as the third set of (thinnest and most closely spaced) struts that once again runs perpendicular to the previous set. A structural "grid" is formed this way that utilizes the structural properties of spruce optimally in this particular application. This is a way of achieving weight reduction for added volume, without sacrificing strength.

You used to make a removable top. Was this so the customer could return it for a new top?

The removable top was easy to replace, but was not designed as such. The idea was to experiment on tops by taking them off and working on them, but then it was also a nice manufacturing thing to be able to get inside for repairs and adjustments.

It is a heavy instrument. Is this possibly a negative when compared to conventional guitars?

Some people like the feel, but I've started working on a lighter version as an option. All SmoothTalkers come with a strap button for the players who stand up, and those ho sit down find that the balance is nice. You don't have the neck resting in your left hand and the body sits firmly on your leg.
Corneille Hutten-Burger and I made a fascinating discovery with the first one I made for him. It had a very small upper bout, and some people got completely lost on it. He liked it in the beginning but then started to develop shoulder pains. I got him into my shop and observed him, first playing his conventional guitar and then the SmoothTalker. We realized that many classical players center themselves over the neck joint at the twelfth fret. They literally align their noses with the twelfth fret, which then positions the guitar in a particular way that they become accustomed to. So with mine, the body automatically lined up to a position much higher up on the neck, forcing the player's head farther from the nut. As a result, the left arm was out of position and the guitar also wanted to slide off his lap. We went into my workshop and I cut a piece of wood on my bandsaw (which is still on his guitar today) and screwed it onto the body to imitate an left upper bout, touching the neck at the twelfth fret. He automatically centered his guitar normally and the whole problem was solved. This is how I developed the upper bout as it is today.

And Mervyn, there is always interest in South African indigenous wood. Are you using kiaat exclusively?

Not exclusively, but mostly, since it is so available and so forgiving. It is so stable that I use it for necks as well. I want to introduce a couple of light colored models later, though.

I use kiaat for backs, but in these guitars particularly, my backs are not as active as they are in conventional guitars where I believe the back is critical. Here once again, kiaat is great.

Is you back glued on? How thick is it?

The back, like the top, is glued onto a thick rim that forms one half of the sides. It is of normal thickness but also small and very stiffly braced. I've arched the back and pitched it quite high. They rend to not resonate much in this configuration. This is just to remove another variable while I concentrate on the soundboard. The sound is a little bit dry as a result, but some players like it for its predictability.

As far as string tension is concerned, what do you recommend on these guitars?

I normally use high tension strings on the guitar but I think it is very much a personal thing. It doesn't matter what you use because the strings do not stress the soundboard much due to the previously discussed bridge design.

What is the market for the Smoothtalker?

One of the first ones I sent to the USA was bought and sold by Gruhn Guitars in Nashville. The feedback I have been getting from the united states has been a combination of interest and apprehension; people find them radical in design. Demand is growing. I find both locally and overseas, as at the Frankfurt music fair, that the good players and professionals immediately see the advantages of the SmoothTalker. The conventional or less experienced players find it weird. The unconventional looks of the guitar seem to intimidate some.
The SmoothTalker is completely modular. It is held together with 13xM5 cap screws, screwed into threaded inserts. I am able to make about four in a month if I never sleep.

Above: The modular nature of the SmoothTalker is shown in this exploded view.

Left: This early guitar in the SmoothTalker experimental series shows the added upper-left bout which proved crucial to the instrument's playability.