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Rogue Neck Setting

TERRY BORMAN

http://www.bormanviolins.com

Chris Germaine: We’re really fortunate to have our old friend and colleague Terry Borman back with us. In addition to his over 35 years of violinmaking, Terry has been active over the years in all sorts of research; research into wood properties, densities, CT scans, acoustics; the list goes on and on. Today he’s speaking on an intriguing-sounding topic, Rogue Neck Setting. I have no idea what he means by that, but with a title like that, I can’t wait to find out. So let’s welcome Terry Borman.

In the field that we’re in, people come up with certain ways of doing things, certain specs. That’s what they were taught, and that’s what they teach. That can go on for a long time, where people don’t change. The old Cremonese makers, they didn’t have specs and things like that to start with. They didn’t have anybody teaching them how to make bad violins. So they started off and they figured out each step as they went along. Then came a period of almost 200 years, it seems like, where you have what I call “extruded inspiration’. You just have a big bag of all your specs, everything, and you put a squirt of it in each violin. That’s it. They don’t change much.

So what I started doing is pick through the bag, pick a piece of the process that might possibly benefit from changing things. Neck setting is one of them.

The way I was taught, and this is a long time ago, the neck was set so that everything pointed down the middle of the instrument. The overstand was typically around six and a half mm on the G side and 6 mm on the E side. The extension was somewhere between 25 and 27 mm. Is this about what everybody here was given for correct specs, the “right” way? [murmer of assent from audience].

If you look at the instrument (figure 1), this is what it looks like with those specs. So the neck is tilted a little bit to the treble side, and it goes right down the middle. Then, about 25 years ago, there were these maybe 10 or 15 sheets of paper that went around, called “New York Specs”. Everybody was passing them around and photocopying them. I think it was René Morel who came up with the idea of pushing the neck heel about a millimeter toward the treble rib, while still keeping the bridge centered between the f-holes. That pushes you off a little bit at the button, so you have to keep that in mind. But it makes it a little bit easier to access the E, once you’re going over the ribs. When you tilt the neck the “regular” way, this almost automatically happens, if you let it, and it will push everything off to the treble side. It works out pretty well. It’s easy to set a neck that way. It looks about like this (figure 2). It’s not much different.
I recommend something different for my own instruments. I’m not saying this is right, I’m just saying this is what I’ve been playing with for about 10 or 12 years now. It seems to work well, and it seems that musicians like it. I align everything to the center of the instrument, just like everybody else, then I invert the G and E tilt, so that the E-string is roughly 0.75 mm higher than the G, and I push the whole overstand up a little bit higher, to 7.25 mm on the G side and 8 mm on the E side. Once you do that, you need to push the extension up a little bit to compensate, so my extension is 27.5 to 28 mm. Again, the neck is roughly a millimeter towards the treble side (figure 3). It looks a little bit odd, at first.

The one thing that you’ll notice is that when you look at the bridge, it doesn’t have the typical bridge tile that you typically see on instruments, towards the E-string. It kind of evens things up (figure 4).

There’s still going to be a little bit of tilt because the E-string is lower than the G-string. My rationale for doing this is that you end up with much better bow clearance at the treble C-bout. I almost never have problems with people knocking into the C-bout. Also, by inverting the neck set, there is less downward force on the G-string and more on the E-string. This helps to create a more resonant lower end and a stronger upper register. And finally, for people who tune their bridges, it’s just easier to tune a more balanced bridge, because the weight distribution is more even.

My bridges do look odd (figure 5). They look more like a pagoda than like a violin bridge. It’s just I’ve done so much work with bridges, and I get to do what I want now.

I was taught that you never curved the outer edges here (on the sides of the bridge), they were always perfectly straight. I don’t think it looks so good. And it’s an easy way I can adjust the weight of the bridge. But the main point is that you don’t end up with a really tilted-toward-the E-string kind of bridge.

To set the neck this way is actually a lot more complicated, but it starts off the same

Figure 2. “New York” Neck Set.

Figure 3. Inverted Neck Set.

Figure 4. Sighting down the neck of an instrument with an inverted neck set.
as the regular method. First you need a center line. I center a pin prick at the neck foot, and another one with the divider here at the nut, and send it up through the center top of scroll (figure 6, left). Then, I use this nifty plexiglass jig and I just score a line showing the angle back that I want (figure 6, right). The scroll fits through the hole in the plexiglass. So this jig makes it easy to get the foot prepared for what you’re going to be doing. I make the neck a little bit longer than typical, but then I put the nut in the normal place, and what that does is give the musician a little more room in half position.

The New York specs for the fingerboard dimensions typically said 24.5 mm, 32 mm, and then 42 or 43 mm. Most of my clients really hate the 24.5 mm part of it, and a lot of them go down to 23.5 mm for comfort. I’m not working for a shop, I’m working for musicians, so I do what they tell me to do. I end up with 24 mm, 31.5 mm, and 43 mm. The 31.5 mm in the middle makes for a narrower neck; it ends up with quite a bit more scoop than you’re accustomed to seeing, but the musicians seem to really, really like it. The 43 mm at the bridge end means that you don’t have a tendency to fall off when you get toward the upper reaches of the fingerboard. There’s space.

Next, you line up the fingerboard so it’s centered on the pegbox and the scroll. I’m guessing everybody does this by using a couple of rulers on either side of the fingerboard (figure 7). I used to seal the end grain with hide glue. I’d apply it three or four times and make sure no more glue soaked in. But hide glue’s probably not the best way to do that. I’ve shifted to using varnish or superglue, something not hygroscopic, something that won’t move so much.
That'll help a little with the neck tilting and things like that. Jeff Robinson did an interesting study not too long ago, which I think showed pretty conclusively that the neck dip is due to that part of the instrument moving.

Typically when you set a neck, you move the mortise, you cut the mortise, you don't really play around with the neck foot, and so the dimensions stay roughly like this (figure 8, left). When you're doing it the way I do it, to get things to work, you have to play with the angle of the neck foot also (figure 8, right).

In the traditional method, when you tilt everything to the E-string side, it's really simple, because as it falls over, you get that extra millimeter to the treble side. It just pretty much happens automatically. In my inverted method, this also tried to happen automatically, but in the opposite direction that you want it to go. To prevent this, when setting the neck, you have to play with the mortise as well as playing with the shape of the neck foot. You still have to end up— most of the time, anyway—centered on the button.

To find the center of the instrument (figure 9), I use a bunch of numbers and then I sort of average them. A lot of details of my instruments are pretty sloppy - different instruments from the same mold vary fairly significantly. So I measure the upper bouts between the purfling and the lower bouts between the purfling. The bridge is going to be centered between the f-holes; so I measure between the upper eyes of the f-holes. The bridge location is my main point; the rest of it I just try to move things around until I get as close as I can. If it's a real instrument, not a cookie-cutter instrument, you're going to end up averaging and kind of smooshing things around a little bit to get your center.

In the finished instrument (figure 10), you can see the tilt in the neck. You can also see the more equal bridge. That’s it!

Any questions?

Q: I just have a question about players playing your violin with the reverse tilt. It’s my understanding that the reason for tilting it in the E-string direction was to make it more comfortable, so the elbow didn’t have to shift as far over to catch the G. How do players address the inverted bevel?
A: No player has ever commented that that aspect felt any different. If you think about it, the musician’s shoulder is moving around a whole lot more than that anyway. Every breath, it’s moving more than that little bit of tilt. So I sort of threw that out early on, because musicians don’t notice that. What I have noticed is that when they pick up my instruments, one of the most common things I hear is that it feels really comfortable, they don’t know why; and they like not having to worry about hitting the c-bout.

Colin Gallahue: With René’s New York approach to the offset—by setting the fingerboard off-center to the treble side, but the strings centered, you effectively have more playing surface under the E-string. This gives a more supportive fingerboard surface in upper positions. So I’m wondering, do you center your strings to similarly, to create a greater surface area under the E-string?

Terry: There’s definitely more room on the E-string. Nobody falls off the G-string.

Colin: So if you’re looking at how your strings lay over the fingerboard, it looks odd on the fingerboard surface.

Terry: It’s asymmetrical, yes. The hand is always pulling toward the treble side.

Colin: Another small factor, your arches in the bridge area, do they tend to be symmetrical, or asymmetrical, or do you simulate soundpost distortion?

Terry: Am I building in distortion into the instrument?
Colin: In the bridge area.

Terry: No. I definitely don’t. I know there are some people who do that. That’s not something I want for my instruments. I figure they’ll get plenty distorted over time anyway.

Colin: Thanks.

Q: Do you offset the string placement on the nut in this kind of setup?

Terry: No. I do what Sacconi suggests, where he talked about copying a Strad, which is, you take a thumbtack or a push pin and you put it up in the pegbox, and you run a string down the middle. I usually don’t know where the middle of my instrument is, anyway, but even if I had everything lining up where I thought the middle was, I would still go where the string said to put the button. And that’s going to be offset a little bit. Getting the button lined up is really, for my instruments anyway, a very important part of the adjustment.

Rebecca Rodman: You mentioned something about the half-tone intervals; were you saying the distance is farther when you’re playing? From a player’s point of view, does it create a farther distance in the interval?

Terry: No, it doesn’t affect that at all. I’m not affecting anything from the nut down. All I’m doing is giving a little bit more space between the nut and the pegbox. So they’ve got a little bit more room, and they’re knocking their hand a little bit less in that half-position.

Q: How much room?

Terry: Maybe a millimeter.

Q: You didn’t make any comment about neck angle that I heard. When you’re raising the amount above the... do you change the angle or is the angle unchanged?

Terry: Are you talking about the angle going over the bridge?

Same questioner: No, I mean the angle where the mortise is.

Different voice: I think he means the angle you were calling the extension.

Terry: Oh. Okay. Because I have a higher overstand, that’s raising things, and so I end up with what I call the extension, which instead of being 25.5 mm or 26 or possibly 27 mm, the ruler that lays on the fingerboard, I don’t mind going 28 mm.

Q: How high do your bridges end up being off the top of the instrument at their highest point?

Terry: Usually about 33.5 mm, which is higher than standard specs. Because it is higher, you get a little bit of extra wood. With all the work I’ve done on bridges, I think probably the most important thing is the weight of the bridge. So you have to be really careful when you get a taller bridge that you take that into account. And that’s why, if you scoop the sides, you can get rid of a lot of weight.

Chris: We have time for one last question.

Q: I’m just wondering, if you do a cello neck-set, do you also tilt towards the C-string, make the overstand on the C-string lower than on the A?

Terry: I haven’t tried it on a cello. I haven’t made a cello in probably 15 years. You know, people don’t contact me for cellos or violas. Pretty much, I only get violins. It’s been a long time since I’ve made a viola or a cello. Or a bass; I made one of those once.

Chris: Let’s have another hand for Terry Borman. Thank you very much.