Bass makers and players are collaborating to craft new instruments suited to the strict demands of the 21st-century musician

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The Bottom Line

"THE LEVEL OF VIRTUOSITY has just skyrocketed," says bass maker Jim Ham of Victoria, British Columbia, noting that today's double bassists are continually expanding the possibilities in terms of repertoire and technique. The best soloists are reaching levels of virtuosity, expression, and accuracy rivaling the great violinists. They're taking this virtuosity to audiences around the world—and lugging the cumbersome things wherever they go.

The basses they play are evolving too, as luthiers respond with remarkable ingenuity to new demands for playability, portability, and responsiveness. It's no surprise that the leading innovators in lutherie work closely with the leading players of the day. The history of instruments is inseparable from the evolution of music.

In short, "It's an exciting time," Ham says.

by Erin Shrader

It may be hard to remember, but before Pablo Casals, Bach's Cello Suites were considered unplayable, even for cellists. "Now they are standard repertoire for the bass," he says.

One of the musicians responsible for expanding the repertoire is Gary Karr, dubbed "the world's leading solo bassist" by *Time* magazine. In his retirement—he no longer does 200 concerts a year—Karr is touring and recording an entirely new program of music never before played on the double bass, "including some Paganini pieces the violinists don't seem to know," says Ham, a violinist himself, who recently heard a preview of Karr's program.

"When those recordings come out bass players are going to go, 'Wow, here's some new stuff . . . .'"

Karr, who famously owned a 1611 Brothers Amati bass, credits Ham with creating "more advances in bass building than there have been since the time of Stradivarius." Karr has commissioned "at least 20 basses during the last 40 years," by his own count, but was never satisfied until Ham made him a bass in 1995.

He still plays Ham No.1 and has used it on all his recordings for the last ten years.

Karr writes on his website, "It's my instrument of choice because it is so user friendly and has such a satisfying tone. The Amati has always been temperamental and difficult to play. The Ham bass does everything I want it to do." He recently donated the Amati to the International Society of Bassists.

Of course, "There is still a large, conservative camp that believes the only good instrument is an old instrument," says Ham, "that it's not possible to improve on the breed. But others are open to something different."

They've had to be. First of all, there never were that many great historical basses to begin with, and what there were have not survived well, explains Ham, who has worked on many, many basses in his 25-year friendship with Karr. Basses are large and hard to travel with, prone to shrinking and swelling, and vulnerable to insect damage, sometimes mistakenly called worm damage. Crumbling edges, cracked ribs, and ever-changing string height due to necks that move with the weather are a familiar plight to bassists.

ULTRALIGHT: Jim Ham.

Inferior materials coupled with centuries of bad repair work add insult to injury.

Moreover, the old instruments were simply not designed for the music asked of them today. "Sometimes in an attempt to make existing instruments more playable, the wrong thing will be done," says the bass maker. "If you shorten the string length the

scale will be shorter, but in the upper register you're further out over the body, which actually makes it more difficult to play, not less.

"One of the reasons I'm an advocate of new instruments is I believe very much in conserving the old ones. Instead of constantly modifying something to make it something it never was intended to be, I think it should be conserved for the beautiful thing it is. Something new can serve the function that you were trying to get out of the old one and likely do that job better."

Karr, he adds, has really opened his eyes to what is possible.

The physical appearance of Ham's bass is deceptively traditional, but the design incorporates thoughtful improvements that make the player's life considerably easier. "It's more than hard enough to play already," he observes. "How can I make it easier to play, so the musician can just play music?"

For starters, Ham streamlined the shoulders and angled in the back of the upper bout, making the upper register more accessible. The neck of a Ham bass slides forward toward the string or back with the turn of a key, much as the frog moves on a bow. The old solution for adjusting string height was to cut the bridge and insert metal screw adjusters in the legs. The bridge, however, is the most tonally sensitive piece of wood in the whole system; cutting it has a big impact on the tone. Ham's mechanism is built into the neck block, a tonally insensitive area. It's invisible except for the keyhole.

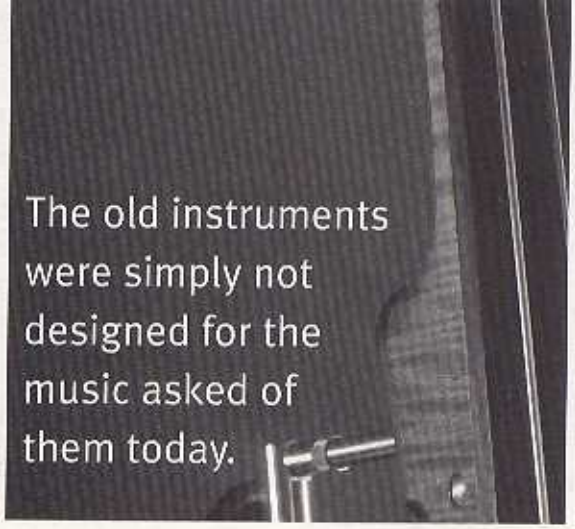
Meanwhile, the ribs are made of two thin layers of maple with a layer of silk sandwiched in between.

"The silk allows me to keep the ribs thin and flexible for better sound while making them more resistant to cracking than conventional ribs," says Ham.

The difference is, again, invisible.

Ham's improvements to the double bass earned him the Manning Innovation Award, a national prize for Canadian innovators. But his latest project is far more radical.

Inspired by a balsawood violin made by Doug Martin, an amateur luthier who designs boats and ultra light aircraft, Ham and partner Ted White have made an ultra light balsa cello, with basses soon to follow. The balsa instruments are lighter, louder, and respond more quickly than even the best conventional instruments.



The ultralight looks more or less like a traditional instrument, only cornerless (Ham wanted to avoid upsetting players visually), but the materials and construction are radically unconventional.

"New materials require new methods to take advantage of the new materials," he says.

For example, the top plate of a traditional instrument is made of two matched pieces of spruce, grain running lengthwise, with a nearly invisible joint in the center. The familiar outline and arches are cut and carved from this joined plank. But the top of the ultralight is made of several pieces cut out flat on a computer-controlled milling machine. The arches form over a system of braces as the pieces are assembled into a cello-shaped rim also cut on the CNC machine.

The finished cello weighs just 4½ pounds.

Ham and White debuted the prototype instrument in November 2005 at the Violin Society of America convention where it was well-received. Cellists like it, he says, adding that it is very responsive and "sounds like a really nice professional cello, but a bit louder."

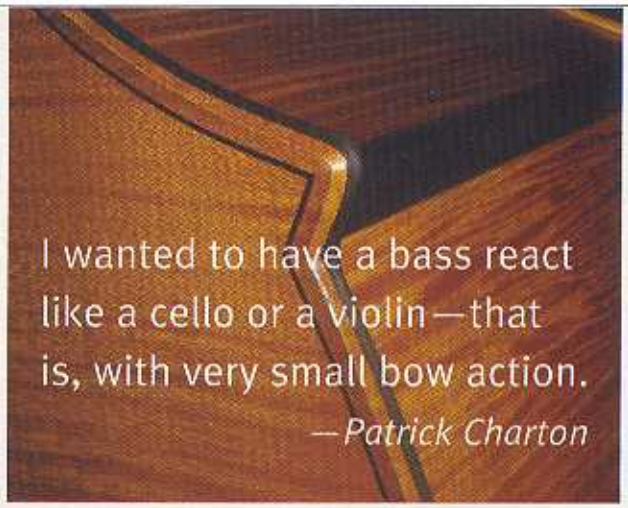
The idea, Ham says, is not to replace or compete with the violin family instruments, but simply to expand the possibilities by adding new instruments.

While Ham gave his new instrument a traditional look, French luthier Patrick Charton endeavored to do the opposite when he set out to draw a new bass. His B21 model, which he calls a bass for the 21st century, eschews Baroque ornamentation altogether while using traditional materials and construction methods.

Charton is a classically trained luthier who makes the entire quartet of instruments. He has won medals for all four, including the prestigious Paris International Competition. He points to these awards as confirmation that he has achieved the highest standards of classical instrument making, as though the honors give him the credibility to move beyond, to make new contributions.

But to Charton, the medals mean nothing compared with the reward of creating a voice for a great artist. Charton, like Ham, also has worked with an extraordinary musician throughout his career: Daniel Marillier is principle bassist of the Opéra de Paris-Bastille Orchestra, an honor he achieved in 1984 at age 22, and an internationally known soloist. "He plays the bass the way a violin player plays a violin," Charton says, "with the same sensitivity, same power of expression, same accuracy in pitch."

For 20 years the two have collaborated on some eight or nine basses with a focus on modern playing requirements: a rich timbre from bass to treble, power, responsiveness, and ease of playing. "I must admit that Daniel is leading me toward a more solo type of sound with lots of power," Charton explains, "and he mostly plays in the upper register."

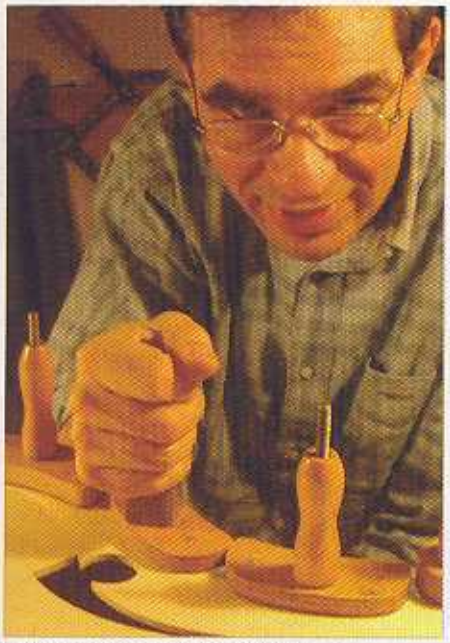


The B21 is the latest fruit of their collaboration. "I had this strange idea three or four years ago to design a non-Baroque instrument. Why not draw an instrument that works like a classical bass, with curves and aesthetics that belong to the 21st century?" he asked, realizing a desire to reconcile his personal interest in modern design with his Baroque profession. "I went to analyze every detail that I'd been making for 29 years now and think 'what is necessary for sound and what is not?' And the idea was to get rid of everything that was only aesthetics and didn't have anything to do with sound.

"Some things you can get rid of and some you can't," he says. "The scroll is one thing that really comes from Baroque aesthetics. If you cut the scroll you don't change the sound of a bass." So the B21 pegbox has no scroll.

Next he considered the violin corners: do they affect the sound?

"They don't," he concludes.



GRASPING THE FUTURE: Patrick Charton.

He first thought of a guitar-shaped bass, but then he realized the classical violin corners have practical purposes. One is comfort—it's hard to pick up the bass without them. There were also technical reasons not to have a continuous rib, he says. "So I designed something that was not Baroque but still useful."

In drawing his new instrument, Charton considered every aspect according to three criteria: sound, practicality, and aesthetics. The design was unified visually by a simple relationship among the curves: there is no change of direction. "If it has to change direction there's a break," he says "and then it's another curve." This dictated a re-design of the c-bouts and f-holes, whose traditional shapes curve first one way then another.

But incorporating aesthetic principles into functional design requires a thorough understanding of the entire system. The f-hole is a good example. "The f-hole is really important in the process of making sound," Charton says. "But of course, I couldn't use the same shape because that's perfectly Baroque!"

Centuries of attempts to change or move the f-holes have failed for lack of comprehension. "They think that it is just a hole so that the air inside can make the air in the hole vibrate," he explains. "But there is another reason for an f-hole and that's to weaken the top, enabling the bass bar to vibrate the top. If you do something to change or move the f-hole, you have barely any movement because it's not weak enough. When you understand that *then* you're ready to draw an f-hole."

Along with sound and aesthetics, Charton has to incorporate the player's practical needs, such as maintaining proper string height. Like Ham's bass, the B21 neck adjusts, but Charton designed a more modern-looking mechanism that works on a different principle. From an aesthetic standpoint, he didn't want the heavy neck block, "I wanted something that was light looking, full of air. And then came the idea that if it was adjustable it could be removable."

Charton made the two actions completely separate so that "when you put the neck back in you get the same adjustment." A player took the idea one step further, requesting two necks: a five string and a four string. Separate necks could be fitted with orchestral and solo strings, which are a step higher, or Baroque strings, about a tone lower, making it easy to play any kind of music without a laborious change of strings.

With the neck out, the flight case is much smaller and lighter, about 40 pounds—well below the weight limits for airline baggage. "To some people the removable neck is very impressive," says Charton, "but to me it's part of general thought about redesigning the bass to our standards as far as aesthetics and sound."

The B21 is full of clever innovations, but Charton finds other aspects more important. "I think my f-hole changed the way the top reacts and helps on vibration," he says. "You know, basses are thought to be very hard to play because there is much more weight in the strings, so the bow has to be heavier and the result is very heavy and hard to get.

"Since I'm among the rare makers that make violins as well as basses I wanted to have a bass react like a cello or a violin—that is, with very small bow action. That's not so easy to do. You have to decide what frequencies to amplify, and to consider the weight [pressure] that comes through on the top so that you find the balance point.

"You have to make the whole system balance, so that the pressure on the top is balanced with the shape of the arch and the other strings. Then when you come with your bow, you break the balance and that gives sound immediately. If it's not balanced, you have to add more weight so you reach the balance point and *then* it starts to vibrate. To me that's probably the secret of sound on all four instruments of the quartet."

"It's not so easy on violin, either," he adds, "but at least on a violin everything is settled in terms of specifications, which is not the case on a bass, and that's what makes it interesting for a maker. You have to adjust and find the way."

For Charton, the close relationship between player and maker is the key to innovation. "It was Daniel who pushed me into the idea that the bass has to react like a cello," he says. "He wanted to have everything possible so he could change nuances and colors. Working with somebody like that is incredible for a maker because if he says something, it's not just because he is lacking technique or experience. It's because he needs it and you'd better do it. That was my challenge for the last 20 years.

"We have this confidence in each other. What is said is true. If he doesn't like something I know it instantly. And he trusts me. He knows if I can do something more then I will do it. That's how we have designed eight or nine basses. That's very precious. I don't think I would be the same maker if I hadn't met him. And he says he has something he can play with, thanks to me." □