

# INTENTIONAL DESIGN

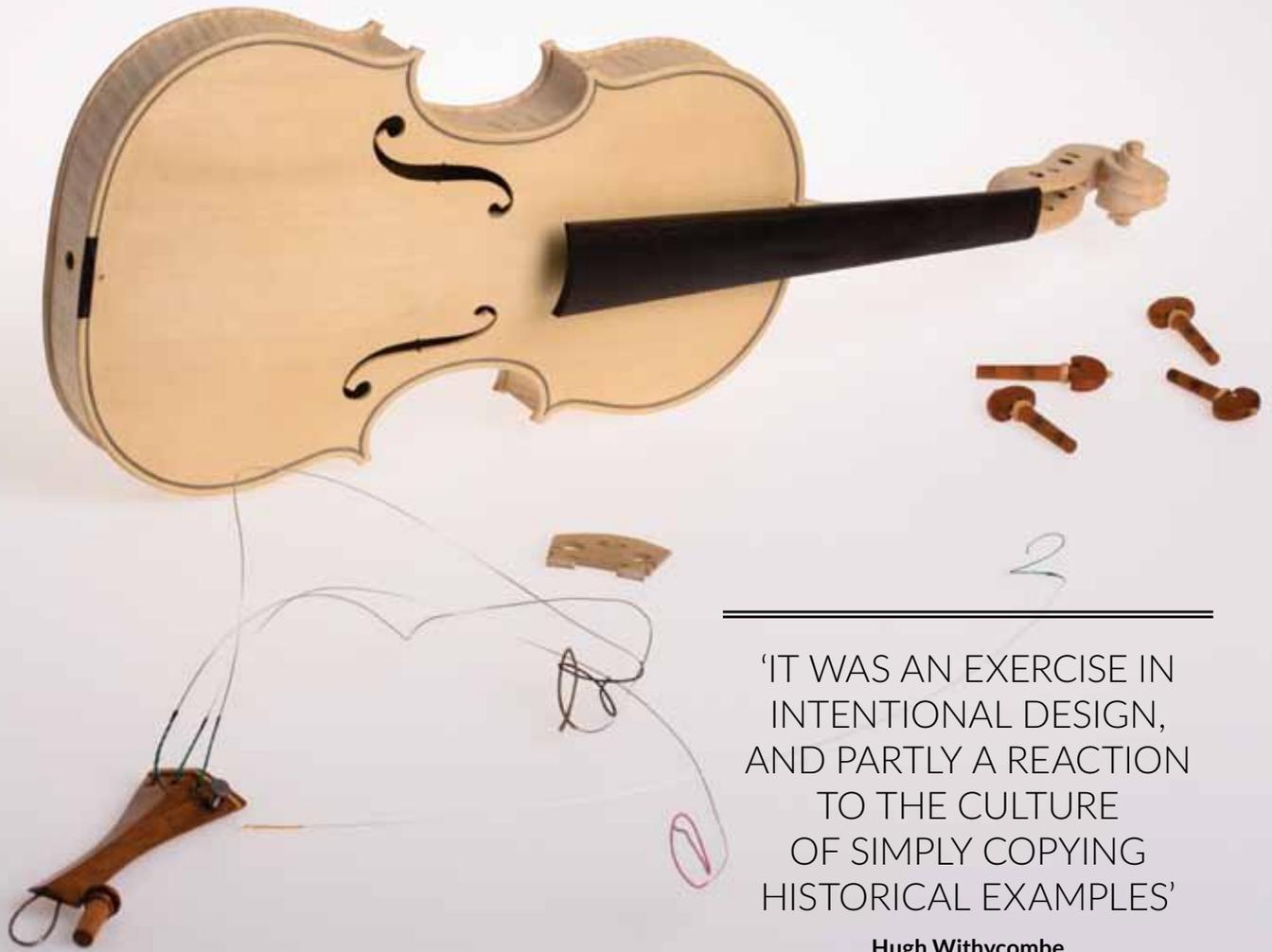


DAVID VAN ZANDT

Sam Zygmuntowicz, creative director of the Obie 1 project, takes a morning meeting of the assembled Oberlin luthiers



An ambitious assignment set at last June's VSA/Oberlin Violin Makers Workshop tasked 60 participants with creating a group-made instrument based on a new generic form. Programme director **Christopher Germain** explains the aims and processes behind 'Project Obie 1', while group team leaders give their perspectives




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‘IT WAS AN EXERCISE IN INTENTIONAL DESIGN, AND PARTLY A REACTION TO THE CULTURE OF SIMPLY COPYING HISTORICAL EXAMPLES’

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Hugh Withycombe

**V**iolin making is without doubt one of the most traditional of crafts. The general shape of the instrument has remained unchanged for more than four centuries, and the tools, techniques and materials used for the construction and varnishing of stringed instruments have evolved little during that time. Our enduring preoccupation with great 17th- and 18th-century Italian instruments, and the obsession among makers with discovering how the master luthiers made their creations, are so inherent in the story of violin making that today the success or failure of a modern violin continues to hinge on how accurately it mimics a 300-year-old Italian masterpiece. US maker Joseph Curtin once remarked that this process of copying classical instruments made him feel like a ‘Civil War re-enactor’.

To an extent this practice is to be admired. But by slavishly recreating a relic from the past, are contemporary makers limiting their potential to develop new ideas and make improvements in the field? This was the question put forward at last June’s Violin Society of America/Oberlin Violin Makers Workshop – an intensive two-week summer practical course for professional makers at Oberlin College, Ohio, which since 1998 has provided a space for leading luthiers and graduates to meet and share ideas, techniques and research. The question had first been aired at Oberlin by US maker Tom Croen, who noted that in the case of many Cremonese makers who came through the workshop of Nicolò Amati, and who learnt his techniques and

inherited his designs, their individual style is still observable despite their use of the same templates for many years. What would happen if you gave a group of established makers the same template and instructed them to each make a violin?

In 2014, makers Hugh Withycombe and Paul Crowley put this question to the test by developing a generic violin form – a wooden interior mould, without corners or other design elements, into which the blocks would be glued and ribs bent around – that could be modified by each maker into a unique, individualised violin model. That generic model was dubbed the ‘Obie 1’.

A key aim of the Obie 1 project was to create a good original violin design that was not directly derived or copied from a previous instrument and that did not conform to the style, sound and workmanship of a historic maker. With only the Obie 1 form as their starting point, each participant would be free to make their own decisions concerning the outline, arching, edgework, f-holes, corner shapes and other elements for the construction process. Their ideas prompted a great deal of discussion about what constitutes good design, playability and sound in a violin.

Every element of the instrument, from the arching to the f-hole design, has an effect on its sound, and by standardising the form it would be easier to understand the tonal effects of each >



Among the 60 participating luthiers were team leaders overseeing specific tasks

stylistic decision. Once the Obie 1 project gained traction among the Oberliners, a committee polled the workshop participants for their ideas on the ideal basic measurements for a violin, based on sound, playability (hence the shorter body length) and aesthetics. The four key measurements for consideration were body length and upper, middle and lower bout widths, and the following guide measurements were agreed:

- **Body length** 352mm
- **Upper bout width** 165mm
- **C-bout width** 110mm
- **Lower bout width** 205mm

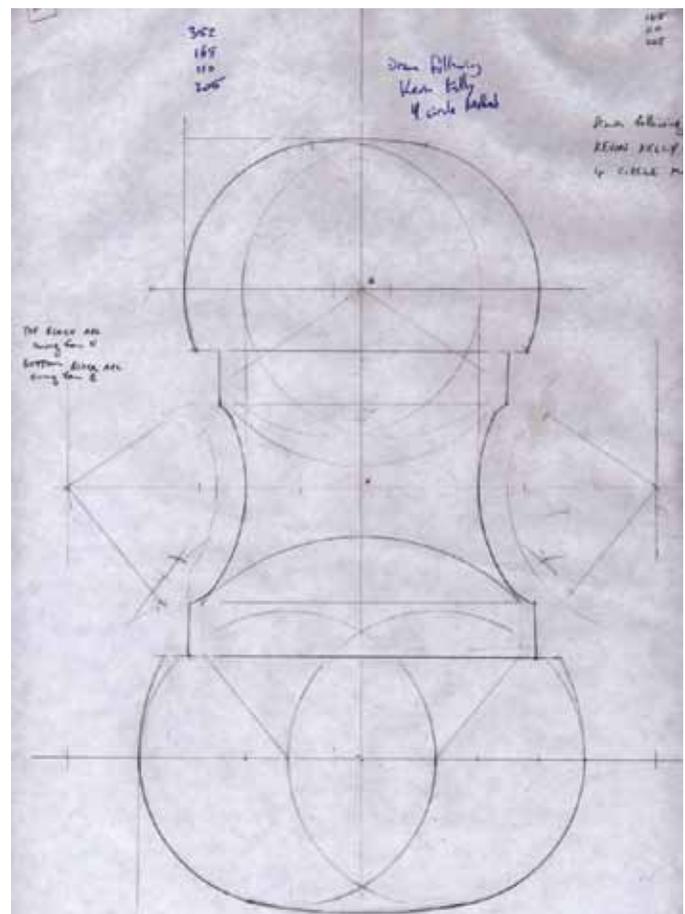
Using these parameters, Withycombe and Crowley created an outline based not on an existing instrument but upon the geometric proportion-based methods of Kevin Kelly – his ‘Four Circles’ system (**example 1**).

Next, tradition gave way to technology as Crowley took the finished outline and created a digital vector rendering using a computer design program called Rhino. From there, 60 identical forms were cut out using a CNC (Computer Numerical Control) machine and given to each Oberlin participant, which included Oberlin alumni. ‘The idea was to combine our collective wisdom to create the form for a good violin design,’ says Withycombe. ‘It was an exercise in intentional design, and partly a reaction to the culture of simply copying historical examples.’

### THE GROUP-MADE OBIE 1

The next stage of the project was to commission a single, group-made instrument in which nominated team leaders would oversee specific tasks relating to the different areas of the violin. This ‘dream team’ of experts, headed by creative director Sam Zygmuntowicz, ensured that all aspects of the Obie 1 group violin were executed with the utmost care and consideration. One priority was to ensure that the finished article was unique without looking like an oddball instrument, and here there was a balance to be struck between encouraging unique design and conforming to standard measurements and proportions. A key part of the process centred on debate, and during construction each group set aside part of each day to discuss the task at hand, comparing ideas and techniques in order to more fully understand the effects of changes on the sound and playability of the instrument as they happened. It was the task of each group leader to consider the options and make the final decision.

The process of completing a playable group-made violin in the white took ten days, and at that point the consensus was that the sound was open, powerful and very responsive. Withycombe and Australian luthier Guy Harrison will undertake the varnishing phase at the 2016 Oberlin workshop, and a final analysis of the violin – when it will be played and acoustically tested – will take place at that time. A full report from the 2016 Oberlin workshop will appear in *The Strad* later this year.



**EXAMPLE 1** The Obie 1 form was based on the ‘Four Circles’ system devised by Boston luthier Kevin Kelly. It uses a very simple framework of four tangent arcs related in simple ratio relationships to provide the underlying design. Layout lines and smaller arcs, which make up the particular design details of each instrument, are then laid out on this framework in a limited number of prescribed ways. ‘There was one thing I found very interesting,’ says Kelly. ‘When I measured the form I realised that I had analysed a fiddle with the same dimensions before. Sure enough, when I compared them, it looked like the Oberliners had drawn an almost exact copy of a “del Gesù” violin – by committee.’



**OBERLINERS' PERSPECTIVES**

Some of the team leaders involved in the Obie 1 project recall the unusual democratic process by which the violin came together

**Sam Zygmuntowicz**  
Creative director



We arrived at this year's workshop with the violin's basic outline done, but the whole concept of the finished instrument had yet to be decided. We needed to have a goal in mind, which meant imagining who our intended client might be. Since the body length is fairly compact and the upper bouts are quite sloped, we came up with a female, petite violinist with small hands, who we visualised as a powerful player requiring a soloist's rather than chamber musician's instrument. This concept created a substantial challenge for us and dictated certain things from the outset, such as the size of the bass-bar and the strength of the internal workings. It meant we could discuss how she might get her hands around the violin, for example, which made a difference to string length.

In my role as creative director I was more a facilitator and thought-generator. I was there to ensure the input of the 60 assembled luthiers was used as much as possible; to explore everything we knew collectively about violin making; and to make sure the fiddle got built. The process was a blank slate for us all. With no moulds, drawings or CT scans to refer to, we had the opportunity to discuss the ramifications of the choices we made each day. For instance, the thickening of the plates went through several pairs of hands, and the final result affected our decisions about the bass-bar, which we then made slightly larger and more robust.

The idea of a sole luthier making a violin single-handedly would have been unfamiliar to most of the great Italian makers of Amati's and Stradivari's times. At their ateliers, many hands would have worked on the same instrument. Of course, the decisions we were making were delineated partly by the established parameters: for example, the widest positioning of the f-holes can be 44–45mm, as with some late Stradivaris, whereas the narrowest on some Amatis is 36mm. Anything less would lead to problems in positioning the bass-bar. So we gave ourselves a free hand to make an informed choice, but only as far as we knew what worked. Our starting point was always what we wryly called 'CVT' – the Collective Voice of Tradition.

**'WE VISUALISED  
A POWERFUL PLAYER  
REQUIRING A SOLOIST'S  
INSTRUMENT'**

**Sam Zygmuntowicz**

I see this experiment as a move towards our taking ownership of the violin making tradition. At the Oberlin workshops we've always tried to copy an old Italian instrument until now, and this has been an effective learning tool but not progressive. Debating what would happen if we made various changes to our pattern has made us pool our knowledge and learn from each other. There is nothing radical about the design of the finished Obie 1 violin – if you antiqued it and set it alongside other instruments, it would fit right in. But in terms of the methods and techniques involved in its creation, it is distinct.

**Raymond Schryer**

**Plate archings**



The Oberlin workshops are set up to be informal, allowing participants to join the group or groups they find interesting. There were half a dozen people working on the Obie 1 plate archings, but at different stages – coming and going while I supervised the project. For me, the arching is one of the most attractive parts of an instrument, and gives it much of its personality. The violin pattern we came up with was loosely influenced by the work of Guarneri 'del Gesù', and for that reason we looked at examples of Guarneris, such as the c.1741 'Vieuxtemps', for an idea of what dimensions and heights might be appropriate for the arching. We took this as inspiration but never let it guide us. I also had some computer-designed templates, which were useful to have at the planning stages. Computer-designed templates can only take you so far, though: when it comes to blending the cross-archings of the lower bouts to the lower corners, for example, there are all kinds of bumps and hollows that become visible in three dimensions.

The shape and thickness of the arching have a significant effect on the instrument's acoustics, so there was a good deal of discussion with the team responsible for the bass-bar and acoustic measurements, led by Peter Goodfellow. We know from experience that without constant communication between the teams things can go wrong. All of us are used to working in different styles, so if one team doesn't understand what the previous team is aiming for, or what the one after them is planning, it could have a disastrous effect.

**Hugh Withycombe**

**Instrument outline and form design**



Because I was part of the working group that agreed on the basic size and dimensions of the violin, I continued to work on the instrument's outline. One point of contention that came up when deciding on its basic shape was the width of the C-bouts. In the end we decided to keep them wide – around two-thirds of the upper bouts' width, rather than half that of the lower bouts. >




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‘THE TASK WAS TO  
TURN OUR 2D DESIGNS  
INTO A 3D FORM’

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Hugh Withycombe

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This decision made the model more like a ‘del Gesù’ than a Stradivari; the general received wisdom being that wider C-bouts tend to result in a louder projection, as well as a darker tone, as opposed to a clearer, bell-like sound. Another part of the design that was worked out almost entirely at the workshop was the scroll. Historically, some makers have made scrolls that are less than ideal functionally, so we wanted to make sure our scroll was both functional and comfortable: that it should be possible to feed all the strings in without tweezers; that it should not be too heavy; and that it should have a slim, clean appearance. Of course the end result was a bit of a compromise, because so much of the decision making with a scroll concerns the aesthetics rather than functionality.

After that, the task was to turn our 2D designs into a 3D form. It was a veritable relay race – one of us did the initial roughing-out of the scroll, another cut out the pegbox, another did the more refined carving of the volute and turns. Finally, team leader Benjamin Ruth made sure that the finished scroll looked crisp and as if only one pair of hands had worked on it.

**Feng Jiang**  
F-hole design and placement



I chose to oversee the f-hole design because I have spent many hours trying to work out how the Cremonese makers placed the f-holes on the top plate – there are telltale traces left to us but never a whole explanation. The basic method is always to find the position of the two lower eyes, then the smaller upper eyes, then drill all four holes and finally connect them. The crucial step is the first – how to locate the four eyes. For this, I used a method that I think Stradivari may have used.

Much of the input from the other makers centred on how to connect the eyes. Since the look of the violin was influenced by Guarneri, particularly in the slender upper bouts, we went for a free, rounded, expressive form that was reminiscent of his style. Changing the curve by half a millimetre can make a world of difference to the instrument’s look;

David van Zandt and Sam Zygmuntowicz worked for half an hour just to get the lines smooth. Of the total time we spent working on the f-holes, the actual cutting only took around an hour.

**Gregg Alf**  
Instrument graduations



The challenge for our team was to make sure the Obie 1 violin had a sound that was warm and full of colours, but still with an edge to it. This can be a challenge with smaller instruments, especially when it comes to making the G string sound big. To guide our work, we used plate flexing, charted the plate thickness profiles and checked the modal frequencies, especially modes 2 and 5. We also worked closely with Ray Schryer’s arching team, and the top arching and thickness had to take into account the bass-bar.

As I saw it, the main difficulty in creating a group instrument was how to give the violin its own distinct personality. With so many hands working on it, there was a danger of ending up with an ‘identikit’-type instrument with expertly crafted parts that lacked the continuity that comes from a single mind. But Oberlin is a learning experience and by sharing with each other we created a group concept that was very specific. It was interesting to see how makers on each team tackled a common challenge. For example: the identical inside forms we each received for the rib structure of our own Obie violin had a small kink in the outline leading into the centre-blocks – a natural artefact of the proportional drawing system used to draw the form. Participants facing the same challenge found different ways of compensating for it. I, among others, chose to touch up the form a little so as to remove the kink. But others preferred to work with the form as it was; to them that was a rule of the game! We approach creative challenges in different ways. Here it was, ‘How far do you deviate from a given outline to trust your eye?’

It’s good that makers respond to such woodworking questions in different ways because that is what lends personality to each maker’s work. I like how Oberlin participants can have their own unique style but still come together on a group project and blend their experience towards a common goal. ●

