Talking points

Former cover star **Philip Koomen** explains the process of creating furniture for the prestigious Hay Festival

I've been designing and making furniture professionally for 35 years. Most of my commissions have been for private clients. This has been a very rewarding experience; the only downside is that few people actually get to see one's work apart from fellow furniture makers, and enthusiasts who read this magazine! When I was selected to design the stage furniture for The Guardian Hay Festival I was thrilled at the prospect of having my work shown at a high profile public literary event. My experience of public commissions had prepared me for a challenging but exciting project.

Commissioned furniture always begins with a design brief, which isn't always as straightforward as you might think. Briefs at school or at college usually come nicely wrapped; the task for the student designer is to convert a problem into a creative solution. There is a big difference with commissions from a private client and an even greater challenge with public commissions from organisations. In both cases the task of the designer is to define the brief in terms of the design problem, i.e. needs, constraints, aspirations, etc. With private clients a visit to the client's home is a prerequisite (usually), providing an understanding of the interior and space in which the furniture is to be located. It is also where the client is most relaxed. There is usually a straightforward dialogue through which the design problem can be defined and ideas explored. Once a creative solution is identified the commission can begin and the basic design can be refined in consultation with the client.

The idea of consultation is essential to the whole commissioning process. Think of the process in terms of a very mature conversation between two adults. Neither party assumes they have the answer, each one is open to new ideas and is willing to drop his or her ideas if they are no longer relevant. It is the opposite of adversarial debate where each party is trying to win the argument! The dialogue reaches a conclusion when the parties feel that they have established a consensus about the creative direction. The unifying element in the relationship is a high level of trust.

All of this becomes rather more complicated when undertaking public commissions, as I was to discover!

Where and why

The Hay Festival is probably the most esteemed literary event in the UK. It attracts international speakers like Bill Clinton, Desmond Tutu and Jimmy Carter, as well as literary luminaries such as Salman Rushdie and Alan Bennett. It creates news, attracting international media as "one of the most famous festivals in the world". It has managed to maintain a balance between corporate sponsorship and involvement of local businesses, and has a huge impact on the local economy. It also manages to be a very inclusive public event – the cost of a ticket to hear a well-known author is as little as £5. It's regarded as a magnet to the liberal-minded public, progressive-minded politicians and visionary writers and thinkers. Even though I had never attended, its reputation meant that it was fixed firmly on my mental to-do-list, so when I was invited by Peter Florence, the director, to propose furniture designs for the four stages I did not hesitate: I jumped a the chance to be a part of the Hay Festival.

The Festival happens once a year in a field in Hay-on-Wye. It used to occupy a series of buildings, including the primary school in the town which at one time was reputed to have over 60 bookshops. In recent years the Festival has relocated to its own permanent field; every structure is temporary with the largest marquee accommodating an audience of about 1,000. There are three other temporary auditoriums. All the connecting passageways are covered as the rain can be torrential...the local fire brigade are regular visitors as rain has been known to flood the many parts of the Festival site. This doesn't, however, stop the Festival.

When I first visited Hay to discuss the project I went with an open mind, a portfolio of work and models of some chair and table designs that I thought could be the basis for some initial discussions. Unfortunately when I arrived at the Festival offices Peter Florence, the Festival Director, had been called away – not a promising start. Two senior members of his team stood in in his absence and we had a useful dialogue which provided the basis for a brief.

The brief

The chair design had to be based on ergonomic principles to provide physical, and even psychological support, as well as encouraging the discourse of speakers, while the discussion table had to provide a setting for up to six speakers to engage with each other and the audience, as well as create a visual focal point on the stage. The table had to be light with a removable top to enable speedy change of stage sets. A set of small occasional tables for drinks was also required for interview situations, as were four lecterns, one for each of the four stages.

The lectern design would have to be flexible enough to work for speakers as short as Sandi Toksvig and as tall as Will Self, and it would need to provide space for a laptop, microphones, a jug of water and glass. An electrician had to be able to set it up within a few minutes, and it had to be light enough that it could be removed by one person, while also functioning as an elegant addition to the stage furniture collection. Finally, it was important that the quality of the furniture was consistent with the Festival and sponsor's name (The Guardian).

Each of the four stages had different furniture requirements, meaning a total of 10 chairs, four lecterns, a discussion table and four coffee tables. It was important that the designs of the Hay furniture would not distract the speakers or the audience from the topics being discussed, so I aimed to create an understated elegance – furniture with good manners!

Having met the organisers in mid-February, and with the Festival commencing on 22nd May, the creative adrenaline was working overtime to pull together a series of ideas that responded to the brief that had been set. After two weeks of sketching, making models and producing full-size mock-ups, I was ready.

▶

The Hay Festival attracts prominent names, meaning that Phil's furniture was used by ex-President Jimmy Carter (top left) and esteemed author Will Self (top right), as well as columnists and journalists from The Guardian (left)

Client meeting

I had insisted that a visit to the workshop-studio was essential to get the necessary feedback from the client. There is a particular psychology to this which I don't fully understand; at one level it's based on reciprocity. I visit the client's location and they visit my workshop, through which we learn about each other's worlds. When a potential client visits me they can intuit my philosophy and way of working as well as explore ideas, see a back catalogue of designs, look at different woods and glean something about the art and craft of furniture design and making. The workshop becomes, in a sense, a design laboratory helping to guide the client through a series of possibilities. They can also be inspired by what they see or what might come into my mind during our conversation. As I mentioned earlier it is part of an extended dialogue.

There are always surprises and Peter Florence's arrival was one of many. He had not stipulated exactly what day he would turn up. I rang his office to find out when I could expect a visit only to be told that he had left Hay nearly three hours earlier so should be arriving soon! Within five minutes of putting down the telephone I received a call from Peter to tell me he was in Checkendon, where my workshop is located, and would be with me in two minutes. As he stepped into the workshop, our first actual meeting, he advised me that he only had 30 minutes before he had to return to Hay for another meeting. Peter was focused, giving me excellent feedback. He liked my design proposals and we agreed on a few finer points including having wooden seats to avoid soiled upholstery and having carved lettering on the lecterns. I was given the thumbs-up to go ahead.

Did you know...?

Red oak is one of three dominant species including soft maple and tulipwood (also known as poplar) grown in the North American forests.

Timber: an ethical choice

I chose American red oak, a lesser known species, and American walnut. The client was particularly receptive to using wood from well-managed sustainable sources. Red oak is a dominant species and its under-utilisation is a challenge for the American forestry and hardwood industry. Developing markets for this timber is essential for its long-term sustainable management. As it's not a favoured oak at present, I was keen to draw attention to it in this high profile project. There are a number of reasons why it is particularly suitable for furniture.

▲ Phil chose American red oak for the project

Firstly it is not, as its name might suggest, particularly red; the red refers to the leaf not the wood. It could also be called mountain oak. The colour does vary and is less consistent than the other oaks such as American and European oak. Red oak often comes in an attractive salmon pink colour. It is, however, coarser in texture and has a less pronounced silver grain figure than other oaks due to its smaller rays. I think that there are two reasons why it is less popular than the other oaks: for a start, it's non-durable and thus unsuitable for exterior joinery; it also has considerably more variation in structure and quality depending on species (being the product of a mixture of species) and conditions of growth. Southern red oak grows more rapidly than northern red oak and so produces a harder, heavier and coarser textured wood. The reason for this is counterintuitive as the longer the growing season the harder and denser the wood; the opposite is true of softwoods.

The cost of red oak is significantly less than the alternative oaks on the market, and the difference increases with thicker timber. This made red oak a very viable choice for 80mm (3in) thick timber, which I used for the Hay chair backs.

A team effort

The Hay Festival furniture was made by a team: Steve Salt, James Willis, Chris Harris, Torsten Salander (a Swedish intern), and me, between February and May 2008. The furniture was divided up so that each craftsman was responsible for different parts. Chris made the chairs, James made the table, Steve made the lecterns and occasional tables and Torsten did a lot of sanding! My role was designer and troubleshooter, which meant that I was responsible for communicating how each design would be resolved through mock-ups, rods, drawings and verbally. This isn't just a one-way communication; it's a dialogue between me and the other members of my team. Problems were usually overcome through discussion as each craftsman was intimately involved in the making process, but if there was no clear solution I would step in and work one out.

In describing the building of the furniture, I think it's helpful to look at the "why" as well as the "how", which will be helpful to you if you want to attempt similar pieces. To copy something maybe has limited benefit, but I am a great advocate of copying in the early stages of developing one's skills; just be aware that these designs require some advanced skills, so anyone attempting them will need some serious experience behind them. I would encourage the novice designer-maker to extract whichever ideas they find useful and incorporate them into their own designs. More experienced readers may want to produce their own version of this design – feel free to try.

The meeting table

The Hay table had to have an elongated elliptical top, dictated by the requirement to accommodate up to six speakers. An unusual aspect of the commission was that it was designed to be used on only one side and viewed by an audience from the other side. I first focused on developing an idea based on an opening book, the radiating 'pages' producing a dynamic form with a rhythmic quality. The inner space of the base would also act as a conduit for the microphone cables. This form, however, lacked stability. The inverse triangular panel was thus used to complete the base. It mirrors the shape of the opening book and references the Black Mountains in the area, but also acts as a stabiliser to the main structure – it is the key to the table's strength, as it had to be very light too for ease of moving. The fact that it's walnut means that it gives greater definition and clarity to the overall piece, I think.

The base looks dramatic but it was quite simple to construct. The radiating arms extend further and further out as they converge towards the outer length of the table. These triangular structures are in two parts, one on each side, forming a gap in the middle where the walnut triangle is positioned. They are connected in the following ways: a central spine, approximately 120 x 50mm (4$^{23}/_{32}$ x 2in) in section, formed the base, onto which each arm was then fixed using Domino joints; the arms were, in turn, secured with screws to two rails that sit below and support the table-top. Once all the arms were fixed to the spine base and rails, the rails were connected with a small strip of wood cleated at each end.

The walnut piece was housed to the spine base and then a series of stainless steel rods were drilled and fitted to connect this section to the adjacent arms. As this was a one-off, James and I did not realise we had to pre-fit the stainless steel rods before we joined the two halves of the table base. However, there was enough flexibility in the arms to spring the rods into place. Once the top was fitted and secured with the wooden toggles the microphone cable ▶

▲ For something as complex as the Hay table, a full-size mock-up was needed

▲ The radiating arms are connected by a central spine, which forms the base, and fixed with Dominos

▲ The arms were secured to two rails using screws; these sit below the table-top and support it

could run freely along the slot in the table-top.

At 2900mm (114in) the table is very long, and at 900mm (35in) quite narrow. But as mentioned, the table had to be light, as over 400 events are staged during the Festival with a turn-around time of as little as 15 minutes. The top was therefore designed to be removable, secured by a series of toggles that can be rotated by hand. All components were also made from the thinnest possible material, usually 20mm (25/32in) thick.

The top has a long slot down the length with a round hole in the middle which looks as if it should have a parasol through it. This was to allow a microphone (and potentially other) cables to run the length of the table.

The chair: body-conscious design

▲ With 10 chairs to make, the components were cut and jointed by batch production

I hesitated at designing a radically new chair design which would be fraught with potential problems given the time constraints. Chairs are the most challenging pieces of furniture to design – designing a one-off means you only get one chance to get it right! My exploration in chair design had made me aware of the need for a body-conscious approach. I want my chair designs to be emancipating. The sitter should feel that he or she can move relatively freely and yet feel supported. Physiologically, we are not designed to sit in chairs; autonomous sitting is the most natural sitting position [AUTONOMOUS AS IN WITHOUT A CHAIR?]. However, we have become dependent on chairs and like everyone else I want to be able to sit on a chair that is both supportive and that enables me to move freely.

The Hay chair tries to address these requirements as well as provide a sense of security in what could be an intimidating situation with hundreds of people watching you! It's designed to give the sitter back support through the curvilinear contoured back which mirrors the natural curvature of the spine. The gap in the back eliminates pressure on the spine. The narrowness of the back is deliberate as it allows the upper body to rotate, a requirement that is particularly important when engaging in dialogue with fellow speakers. The wooden seat eliminates padding as sitting stability is achieved through good contact with the sitting bones. The arms, which are below elbow height, give the speaker a sense of defined space as well as a contact point to dissipate nervous energy.

▲ The front and back leg components were shaped on a spindle moulder using templates

My overall intention with the Hay chair design was to create a body tool that helps the speaker feel as relaxed and engaged as possible. In my estimation, if the speakers were oblivious of the chairs they were sitting on, the design would be a success.

Each chair consists of two back legs made from 80mm (3in) stock, two front legs made from 50mm (2in) stock, three 30mm (1¼in) rails, and in the case of the armchair, either laminated arms made from three layers of 12mm (15/32in) stock or one thickness of 30mm. The spacers between the back legs were made from 25mm (1in) walnut. This was all kiln-dried timber. You may have problems with the 80mm timber as this thickness is prone to develop internal checks through the kilning process. You could instead use air-dried timber (20 percent moisture content) as this is less susceptible to drying defects and the design of the construction allows for greater shrinkage in these components. A cost effective alternative, by the way, to red oak – which may not be available – is ash, which would work excellently for these chairs.

The chair was designed to be batch produced in quantities of six or more; in my experience, this produces optimum economies of scale. The versions without arms each took 22 hours and the armchair 32 hours, but if you're only producing one I would add at least 50 percent to these times.

The front and back leg components were shaped on a spindle moulder using templates that matched the finished profile. We used a 100mm (4in) diameter cutter with a matching diameter bearing (this is identical to the router cutters with bearings that are readily available). The shapes were profiled after they had been cut to rough size on the bandsaw. The rails were planed and thicknessed to 25mm. The concave profile on the underside was added after the rails were tenoned. We cut all of the tenons on our spindle, which has a dedicated tenon cutter block; an integral sliding table completes the conversion. We cut the mortise holes on a 9mm (23/64in) mortiser. As they are all through-mortises they must be cut very carefully to avoid break-out on the show face. The only exception is the front rail which has two mortises to take the two parallel rails that also secure the back legs; this was faced with a 4 to 5mm oak facia after assembly. I'll explain why.

For both aesthetic and practical reasons, all the main constructional joints of the chair are through-mortise and tenon joints. Aesthetically, the through-mortise and tenon joint with the two flush wedges is a highly attractive feature in a construction; it also reveals how the construction was made, enabling the chair to be 'read'. The practical reasons are in many ways more important in this particular design, though, as the minimal construction required each joint to have maximum strength to prevent joint failure – there is, after all, only one main joint securing each leg. The front legs are particularly vulnerable, as the one tenon has to do all the work to secure the leg; the back legs effectively become one unit when joined together with the spacers.

▲ The through-mortise and tenon joints were attractive, but they also provide strength

TIP

The through-mortise and tenon joint gains maximum strength by tapering the mortise hole so that it is at its widest where the tenon is exposed.

The tenon was assembled after two saw cuts had been made in the tenon about 5mm (13/64in) from the outside edges. Once the tenon was glued and fitted, tapered wedges were hammered into the saw cuts to fill the gap created by the sawcut and tapering tenon; this produced a dovetail shape. The strength of this joint is maximised because the leg is extended to form either a stump projecting above the seat or a support for the arms, the extra length ensuring that the mortise is not weakened above the joint because of short-grain. By using this joint the chair withstands extensive strain when in use; this is particularly true of the back leg joints which become stronger under strain.

The genealogy of a chair design

The Hay chair design has its genesis in a design that I originally created in 1984. Much to my surprise it has evolved over the last 25 years and still continues to be adapted to meet new requirements. The Hay version addressed a specific need to create a defined space for the speaker in addition to the other body-conscious factors I have already mentioned. The original design was influenced and shaped by chair designs that had inspired me for different reasons.

In my formative period as a young designer-maker I particularly liked the plank chair design by Pearl Dot, which has an elegant but minimal curvilinear laminated form that reflects the spinal contours. Another design that influenced me was the *Golem* chair (1970) by Vico Magistretti; the extended front legs were a feature I incorporated into my first prototype. I was also impressed with the chair design experiments of Victor Papanek (the author of *Design for the Real World*, 1974). More recently I have been studying the cultural history of the chair by the design academic Galen Cranz, whose book *The Chair: Rethinking Culture, Body, & Design* (1998) provided a solid grounding in body-conscious design that has influenced my thinking.

Theory without practice has little value, and I have spent over 10 years developing body-conscious knowledge through daily yoga sessions! My conclusion is that chairs are cultural artefacts that reflect our preoccupation with status and style. Our bodies were naturally designed for sitting without a chair – think of toddlers and prehistoric people. Somehow we have managed to unlearn what our body has evolved to do. Chair design, at its best, could be described as remedial, in that it tries to accommodate our ill-educated and malformed bodies.

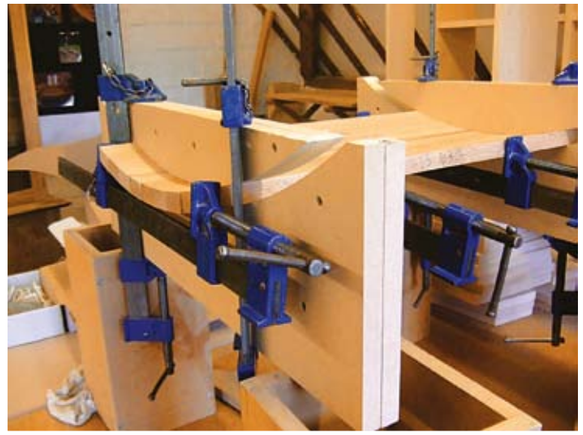
Lecterns & occasional tables

The lectern was the most difficult piece to design and, in my mind, the least successful. The information I received on the requirements changed as I was designing it. My original idea was to create an elegant feminine form, but as the input changed the final version became a bit squat by comparison. However, I managed to incorporate the technical requirements for cable management and lighting on the one hand and fitness for purpose on the other and still created a soft curvilinear form to sit well on the stages.

The hand carved lettering was requested later by Peter Florence. The crisp carved letters would be highlighted when light falls on them at an angle, casting strong shadows (the woodcarver, David Williamson, did a skilful job interpreting The Guardian and Hay Festival typography).

The lectern and small tables shared a number of common elements. In both pieces I used biscuit joints, in combination with screws and end-grain plugs to conceal the screws, as the joining method. This method, in the right context, provides a simple, effective and sound alternative to more complex, labour-intensive methods. For example, the circular three-legged occasional table was made from 20mm thick oak. Each of its legs was located by two biscuits to the underside of the top. Once all three legs were located and glued at an angle of 120° to each leg they were secured with two 50mm screws that go through the top, having previously drilled 10mm diameter hole in the top to a depth of 8 to 10mm, followed by a suitable pilot hole that also enters the leg itself. The joints were then strengthened with 50mm screws that were secured from the table top side, having drilled a series of 10mm (25⁄64in) diameter holes 8 to 10mm deep and suitable pilot holes, which in turn extend into the end-grain of the legs. Assembling the legs can be quite a quick job after gluing the biscuits and joints as the screws secure the joints, pulling them to a tight fit to the underside of the table-top. In the Hay occasional table I created a small internal gap between the legs. A small round walnut block of 25mm diameter was fitted to the space having three flat sides each 20mm wide to match the thickness of the legs. This was secured to the legs with small biscuits glued in place.

The success of this simple piece depends on good proportion and accuracy. The table has a 450mm (18in) diameter top and a height of 450mm; the legs were tapered on the outside, narrowing at the top. The top is distinguished by the selection of the figure in the wood and the position and precision of the 10mm screw holes. These were filled with end-grain walnut plugs. I allowed two screws per leg so that each leg has three pairs of radiating walnut plugs. Setting out the position of these drill holes in the preparatory stage of construction is a prerequisite to creating a simple but elegant occasional table.



The curved sides of the lectern were coopered. Getting the angles of their bottoms to fit with the curve of the base proved very tricky

The lectern was a more complex piece and, as I mentioned, presented some unprecedented challenges. While you mayn't have much desire to make a lectern, there are three interesting lessons I learnt from the experience that may be helpful to you in your own woodworking exploits.

The biggest problem I had to overcome was how the bottoms of the two sides of the vertical column were going to marry with the curved base. Before I began the construction I assumed that the convex curve of the base would require a matching concave curve on the underside of the vertical sides, a simple relationship. The base was made from coopered solid oak which was hand planed to achieve the curve, so I was anticipating a degree of variation in the curvature. However, having profiled the concave curve at the base of the vertical sides I noticed that as I adjusted the sides to the correct angle I wanted the concave curve only fitted on both sides at an angle of 90° to the coopered base. As the angle changed so did the relationship of the two curves. The problem was further compounded

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by the thickness of the vertical sides; as the curve on one side is in a parallel alignment with the curve on the opposite face. Even though they are one curve, because of the thickness of the wood they create two separate curved edges which, when presented to an opposite curve of the base, only meet on one edge. I resolved the problem by trial and error. I realised I would need to find the correct curve for the angle at which I was positioning the vertical sides. Once I had done this I would have to stagger the curve on the opposite edge of the same vertical side. Eventually I achieved a satisfactory result. Again, like the occasional tables, I secured the vertical sides to the base by screwing them into position from the underside of the base.

The second challenge was to complete the column section of the lectern. I intended to do this by bending and gluing a solid piece of oak to form the third and front face. To do this I had to first machine a solid piece of oak to a thickness of 4mm (5⁄32in) so that it could follow the curve I had created, and then angle the leading edges of the vertical sides so that they were flat in relation to each other. Having achieved this I was able to glue the solid oak front face onto the face edges, which was done using cramps and layers of thin plywood and MDF to spread the pressure on the new panel. A few concealed panel pins were added as extra insurance.

The final section of the lectern – 'the reader' – was secured in a similar manner to the occasional table. This method had the added benefit that the alignment of the reader did not have to be to the nearest millimetre as I decided that it was not necessary to align the reader to the column using biscuit joints. Again, I used decorative walnut plugs to cover the screw fixings.

To screw or not to screw!

It may seem odd that I should propose the use of screws alongside the mortise and tenon joint. The first consideration is that the principles of solid wood construction should never be compromised when using screws. Secondly, a screw can be used as a form of dowel with the added benefit that it does not need cramping. Thirdly, it is a very economical labour-saving method, but it requires restraint in its use. Finally, it opens up creative possibilities.

◀ The vertical sides were secured to the base by screwed them into position from the underside of the base

Finishing

The furniture was finished by hand with Liberon finish oil and waxed, except for the table-top which was spray-finished in an acid catalyst satin lacquer. The oil finish enriches the natural colour of the wood and the wax gives a silky finish, which is particularly important on the parts of the furniture that will be caressed, such as the chair arms. This finish is very serviceable in that it can be revived easily with additional applications of oil. We applied the oil with a muslin rag, wiping off the surplus within a few minutes of application before it went sticky. Three or four coats are required to achieve a good finish. Schoolhouse wax was then applied with a rag and separate rags were used for polishing.

While the oil and wax finishes are excellent for chairs and decorative show wood they are not ideal for table-tops which may get heavy use and abuse. The satin lacquer finish provides a heat and water-resistant finish that only requires wiping with a damp cloth.

A success?

With only a few days before the start of the Festival, all five workshop team members, including me, were working to capacity to complete everything. 'Everything' included four MDF cases to store the lecterns. A four-hour drive took James and me to the Hay Festival site which was being transformed from a green field into a village of marquees and walkways. We eventually found Andy, my contact, and deposited the furniture on the main stage.

Within a few days I was back as a guest of the Festival. It was everything that I'd imagined it would be: a global university with lectures challenging assumptions, stimulating thought and presenting new ways of thinking about issues. It was a strange feeling seeing the furniture, particularly the chairs, playing a subservient role in talks, debates and interviews, and watching Jimmy Carter sitting on my chair as he was interviewed on Middle Eastern politics. This became an international news item on terrestrial television.

Vanity aside, did the furniture fulfil the brief? That can only be answered by the client, Guardian Hay Festival Director Peter Florence: "This is a landmark project for us, combining creativity with the sustainability and beauty of the most natural of all materials. The red oak is warm and exciting and Philip has matched our brief perfectly, reflecting his understanding of the unique character and style of our event with an enduring furniture collection that speakers and audiences will appreciate and enjoy for many years to come."

Look out for an article on Philip's Hay Wave and Splash follow-up project in an upcoming Good Woodworking.

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