



girschik music box



design-craftsmanship

Peter Cook

collaboration

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created at

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Perth, Western Australia

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dates

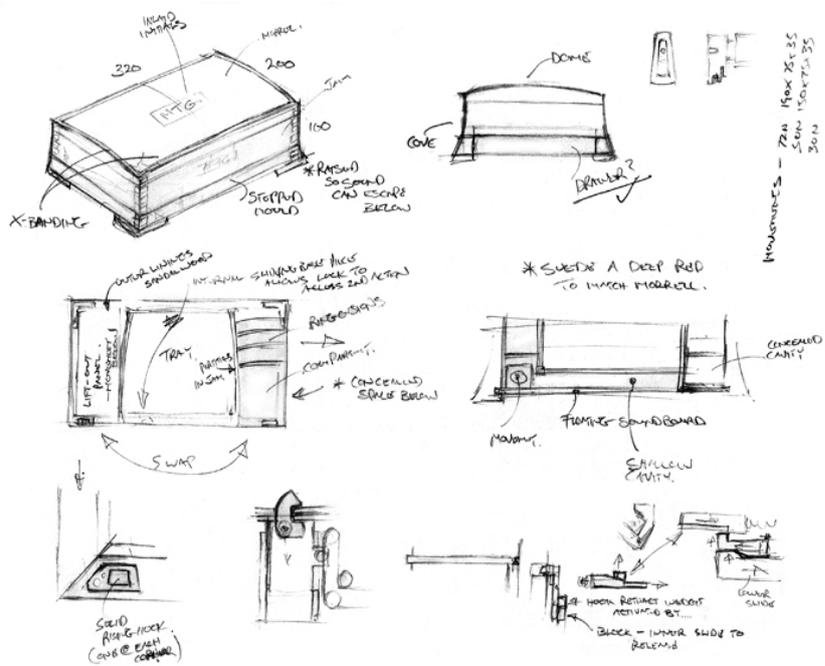
Design and development commenced in June 2007. Work was completed on the Girschik Music Box - the first in what will be a limited edition set of seven boxes - in July 2008.

background

During the 1990's, Peter Cook gained an international reputation for the creation of unique handcrafted puzzle boxes - containers with hidden compartments and locks, often involving complex mechanisms.

In 2007 Scarab Studio Wood was commissioned to build a sophisticated music box of outstanding character. The box was to feature a range of finely crafted decorative elements, alongside a stunning 72 note clockwork musical movement and a hidden chamber with a secret locking mechanism.

Once the seed was planted though, it seemed to grow on its own to evolve into a project far more ambitious - the creation of a limited edition set of 7 boxes. The first two boxes in the set would be a matching pair of music boxes. The design would then be developed to create a further unique set of five complex puzzle boxes entitled 'Labyrinth'.



For more on the Labyrinth project, [click here](#).

design

The major design elements were fleshed out in early discussions with the client. Timber selections were made and it was decided that the box would be lockable, with perhaps even hidden somewhere a 'secret' or two. The inclusion of a clockwork musical movement was to be a primary feature of the box. It was therefore considered crucial that the musical movement itself be a substantial and beautiful mechanism, and that the movement would resonate through its own acoustic soundboard.

The Girschik Music Box was originally envisaged to be a one-off piece. However, it was the evolution of the project into a planned set of 7 boxes that allowed us to develop and include features that could not have otherwise been possible. Many experiments were done and special techniques developed, knowing that the time spent could be spread across the full set of 7. The design and engineering of the fully custom built locking mechanisms is perhaps the most significant of these 'extra' features.



Work started with a mixture of pencil-on-paper sketches, written ideas and discussions. With the expansion of the project into a set of 7, it was decided that every aspect of the work would be custom made, included all the metalwork - from the hinges to the locking systems. The designs were then extensively developed into a series of detailed drawings using computer aided drafting (CAD).

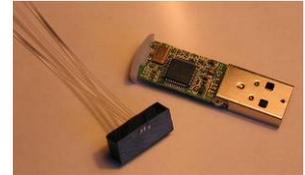
technology and craftsmanship

State of the art technology has played a key role in the creation of this unique edition of 7 boxes. To create many of the small-scale mechanism parts, we employed a select group of companies who operate state of the art, computer controlled (CNC) manufacturing technologies

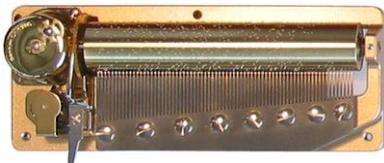
such as laser-cutting, spark-erosion wire-cutting and automated machining processes. Laser-cut parts were made by emailing outlines directly from our CAD drawings to the laser-cutting facility where they were then precision-cut from high grade stainless steel.

However, the finished works could not be realized without the intensive use of hand skills and time-honored traditional techniques, in both wood and metalwork. Dovetail joints were crafted using hand processes that have not changed in millennium; the chisel is honed by eye to the point where it will shave the hairs of your arm. And with it the tails of the dove are pared sharp and tight. The work of the metal-smith is much the same; at the wooden bench, surrounded by the manifold tools of trade, the fine metal is fashioned by hand into a thing of beauty and desire.

At its heart, a box is a functional device; its job is to store things. It seemed a natural evolution on this 'theme' that the box include a built-in digital storage drive. As the box stores its physical treasures, the USB drive can be used to store digital copies of treasured documents, images and audio files. The document you are now reading is stored on this drive. Access to the drive is via a small flip-open panel in the rear wall of the box. Activity indicator lights are set into the timber adjacent to the USB port. Indicator light is transferred from the drive's LED tail light, via an optical fibre feed.



musical movement



- score:** Second Piano Concerto in C minor, Op.18, by S. Rachmaninoff.
- manufacturer:** Sankyo, Japan.
- specifications:** "Opheus", 72-note, hand-winding, clockwork movement. 190mm x 75mm x 35mmH.

movement

The enchanting clockwork musical movement fitted into the box plays Rachmaninoff's Second Piano Concerto in 3 parts. The movement can be watched in action through a protective glass panel, by lifting out the left hand upholstered tray. A slide switch located against the left partition, inside the lower central compartment of the box, activates the movement. Leaving the switch in the 'open' position will allow all 3 parts of the concerto to play continuously. Each part of the concerto can also be played individually by opening then closing the switch again in a single action. The movement drive-spring is wound with the key located directly below the movement on the underside of the box. Visible on the top of the drive-spring cover is a device called a 'Geneva stop'. This guards against over-winding of the mechanism.

soundboard

The full bottom panel of the box is a dedicated soundboard. The movement is mounted directly to this board. The soundboard is made from a thin panel of antique Californian Redwood, selected for its fine acoustic properties. This wood first came to Western Australia around 100 years ago to be used as shelving in one of Perth's historic clothing retailers. The soundboard and internal floor of the box are independent of each other, separated by a thin air cavity. This allows the soundboard free resonance across its full span. Sankyo have gone to great lengths to color or decorate the music for trills, grace notes, mordents and other musical effects. The soundboard accentuates these qualities and gives beautiful tone to the bass notes of the music. At each corner, the box is raised on subtle feet, creating openings all around from which the music can emanate.



woodwork

The stunning lid of the box features a 'mirror-matched' panel of Red Morrell burl, from the WA goldfields. The panel was created by cutting consecutive slices of timber from the blank, and then opening them out as if they were the pages of a book. The surrounding inlaid cross-bandings were made by bonding the different parts together into a single composite block, then slicing off the individual inlay strips.

The outer walls of the box were all cut from a single piece of select Marri. Special care was given to composition so that the original piece of timber wraps right around the box, ensuring harmony is maintained in the finished work. The graduating, mitre-dovetail joints were marked out and cut by hand, a time-consuming yet meditative process.

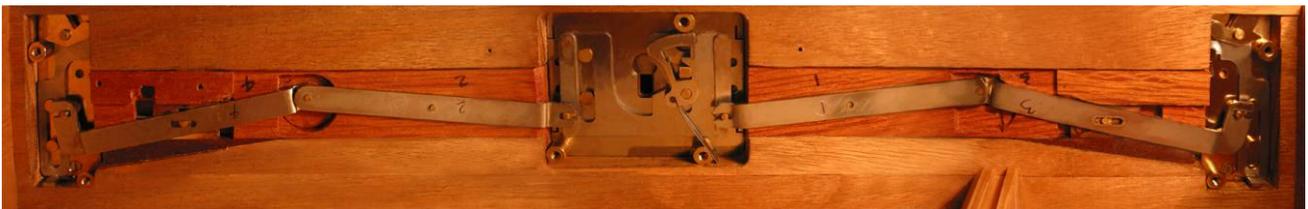


Inside the boxes, the complex locking mechanisms are embedded within precise cavities and hollows cut into the walls. Since it was not possible to put the wall sections directly onto the CNC router to cut these cavities, we instead had the CNC routing machine make us a special set of guides and templates, allowing us to cut the precise cavities in the workshop using a manual routing set-up.

Once routing of the cavities was complete, the walls were assembled and the outer shaping done. The curves of the lid and walls of the box combine to convey a sense of solidity, whilst tracing both contemporary lines, and those of a more traditional chest. The wall 'coves' were shaped using an unusual table-saw technique, where the assembled box was worked diagonally across the saw-blade to carve away the wood. The surfaces were then shaved smooth by hand with a cabinet scraper.

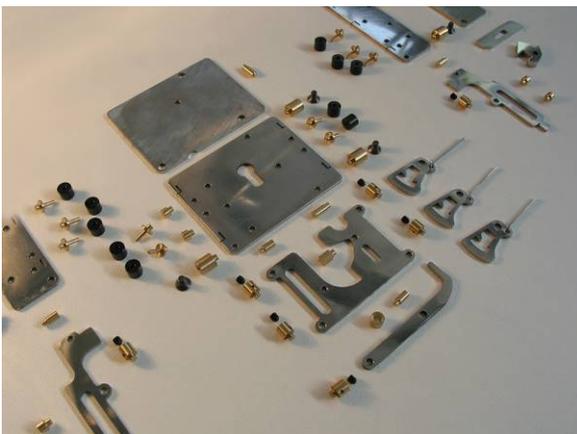
The inside of the box is fully lined and fitted out with rare and beautiful sandalwood. Although finely finished, the timber has been left raw to preserve its natural aroma. The perfume of this wood is world renown and will linger in the box forevermore.

metalwork



All the exposed metalwork is fabricated from high grade stainless steel. Once components were finished and trial fitted, all exposed surfaces were polished to a mirror finish before being gold-plated.

Inset into the lower molding on the right side of the box, is a small gold Scarab. This maker's mark identifies the box as being made at Scarab Studio Wood.



the Lock

There is something about a good lock; the way it operates; why it does what it does; the timelessness of its mechanism. The sentinel guards the gate and awaits the one key - some kind of symbolic answer... No simple lock (were it possible to find one of quality!) could be fitted to this box. Its action must be at once secure and elegant. Its mechanism robust and precise. The central locking system installed in this box is fully custom designed and built at Scarab.

The lever-lock style mechanism has 3 primary lever-tumblers. In a lever-lock, when the correct key is inserted and turned, the 'bit' of the key will nudge each of the levers in the lever-pack across, precisely aligning the channels or 'gates' cut within them. The 'bolt-post' can then pass through the gates, from the starting 'trap' to the finishing 'trap', to release the lock. The lever-tumblers in this lock are independently sprung, and double-acting, meaning the bolt will be caught in the trap if a given lever is pushed too little, or too far.



Two keys were made for this box. The head of each key is laser-pierced with the initials 'MTG'. The parts of the keys were silver-soldered together and the 'bit' of each key was filed by hand to precisely mate with the lock's tumblers.

The central lock unit and the twin independent rising claw units are fabricated from stainless steel plate and turned brass components. The two rising, articulated claw units are each connected to the central lock unit via a pair of pivoting arms. To allow for the fine setting of both the vertical travel distance, and the start-stop rest positions of the articulated claws, one arm in each pair has an adjustable pivot position. A slot at the arm's axis allows the arm to 'float' on its brass axle-post. The axle-post in turn has fine screw adjustments both vertically and horizontally. Elsewhere, internal springs are hand made from spring steel, and small rollers are turned from acetyl plastic with 0.8mm silver steel axles. Some mechanism elements are linked with Spectra® cable.

the hinges

The hinges of a box are often taken for granted. However they are a fundamental element. Even the best off-the-shelf hinges in the world fell well short of our needs, and so the box's pair of fine quadrant style hinges (with inbuilt lid-stay arms) were fully custom made at Scarab.

The main plates and quadrant stay-arms were laser cut from 3mm stainless steel. Stainless steel cuts quickly and very nicely under the laser, although the parts still need to be cleaned up. Bearing surfaces (particularly in the locking system components) also need to be highly polished. Although a slower process, CNC guided spark-erosion wire-cutting leaves a far cleaner cut, with a much higher degree of precision. The hinge knuckles were wire-cut from 6.35mm pre-polished stainless steel capillary tube. With minimal honing, the individual knuckles nested together and rotated against each other beautifully. During assembly, the knuckles were silver-soldered into corresponding coves cut across the rear edges of the hinge-plates. The coves were cut by clamping four hinge-plates together in a special holding jig, then drilling out all four coves in one process. All the knuckles on a given hinge plate must be soldered simultaneously. This tricky process requires all the parts to be arranged on a small holding frame with a dummy hinge pin, then bound together as one with jeweler's binding-wire.

The whole arrangement is fluxed, primed with solder, then heated with the torch until the solder 'flashes' into the joints. Once the leaves of the hinges were de-scaled and polished, they were pinned together with silver steel pins, and the pin holes plugged and dressed.



dimensions

433mm x 269mm x 117mm (external).

materials

woods

Lid panel	Red Morrell [<i>Eucalyptus longicornis</i> - WA].
Lid banding (borders)	Minneritchie [<i>Acacia cyperophylla</i> - WA].
Lid banding (inner)	Black Locust [<i>Robinia pseudoacacia</i> - South Africa].
Walls	Marri [<i>Corymbia calophylla</i> - WA].
Internal lining	Sandalwood [<i>Santalum spicatum</i> - WA].
Soundboard	Californian 'Giant' Redwood [<i>Sequoia sempervirens</i> - USA].

mechanics

Mechanism components are fabricated from stainless steel, spring steel and brass. All exposed metalwork is fully gold plated.

upholstery

Internal linings and cushions are finished in Macrosuede®. Color: Mulberry.