

The Horological Journal



OCTOBER 2018

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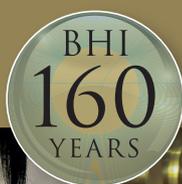




BRITISH
HOROLOGICAL
INSTITUTE

AWARDS DAY PROGRAMME

Saturday 27 October 2018



For further information

Phone: +44 (0)1636 817604

(Mon-Fri 09:00-17:00)

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WWW.BHI.CO.UK

British Horological Institute, Upton Hall, Upton,
Newark, Nottinghamshire, NG23 5TE, UK.

Please note that this event is by invitation only.

10.30am

Doors open

Refreshments in the Watch Gallery

OPENING OF THE AWARDS DAY

Brian Noble

Operations Manager, BHI

Stella Haward MBHI

Chairman, BHI

Ballroom

INTRODUCTION

A talk by Alan, Viscount Midleton FBHI

President, BHI

Ballroom

Watch Service Demonstration

THE BALANCE STAFF: REVIVING ENDANGERED SKILLS

Alan Burtoft FBHI

Ballroom

LUNCH

Drawing Room

GUIDED TOUR OF UPTON HALL AND THE COLLECTION

Alan, Viscount Midleton FBHI

President, BHI

Main Hall

A talk by Dr Jane Desborough, Curator of Scientific Instruments, Science Museum

Ballroom

AWARDS CEREMONY

Followed by toast to the students

Ballroom

PHOTOGRAPHS

Anniversary Watches

Creating Watches for a Special Occasion

G. Mike Cardew FBHI



Six years ago, I was asked to design two watches for a forthcoming silver wedding anniversary. This was the first time that I had taken on a commission (I make only one or two watches a year). I thought I would take on the challenge, since the anniversary was over a year away and I was not under too much time pressure.

All of my watches prior to this were designed and made for myself with no input from others, so the thought of working with others to produce a pair of watches intrigued me. The couple in question had seen my previous work and wanted watches that were bespoke and unique to them and would reflect the special occasion of their anniversary.

Specification

To start the process we discussed, in broad terms, the type and style the couple might want. I gave a few ideas and sketches to them and they came back with preferences and photographs of styles of watches that they liked. In a relatively short time the rough guidelines were established and a design brief had been written.

In summary, the requirement was for two watches: one for a lady and one for a gentleman. The watches should look like a pair and have a similar design style. They were to reflect and celebrate a silver wedding anniversary. The couple had a strong wish for the styling to have an Art Deco feel and the cases should be rectangular in form. A 'less is more' approach to the styling was emphasised. Early design style sketches are shown in **Figure 1**.

Lengthy discussions on the case material took place; silver was originally requested but was dismissed as being too prone to tarnish. Coincidentally, I had at the time been working on a number of cases made from a high quality polymer. I chose a material that was black, but with embedded 'silver' specks. After sending them a sample it was agreed that the cases should be made in this type of material. It is 'solid surface', i.e., it is a hard resistant material used for high quality work surfaces, a polymethyl methacrylate with alumina trihydrate fillers. (It is available in many different colours and designs.)

In terms of the movements, the preference was to have tourbillons. For these watches, I was not going to make movements from raw materials, but modify and refurbish existing calibres.

A tourbillon was possible in the gentleman's calibre. However, due to the required small size of the lady's, such a complication was not practicable. My suggestion here was to use a conventional movement, but with a 'cut-out' to show the escapement through the dial. This meant that both watches retained the same look, with a round window in the dial at six o'clock to display the escapement.

The design style for the dials was to be clean and uncluttered, and clearly Art Deco. Again, a number of sketches were submitted before final agreement.

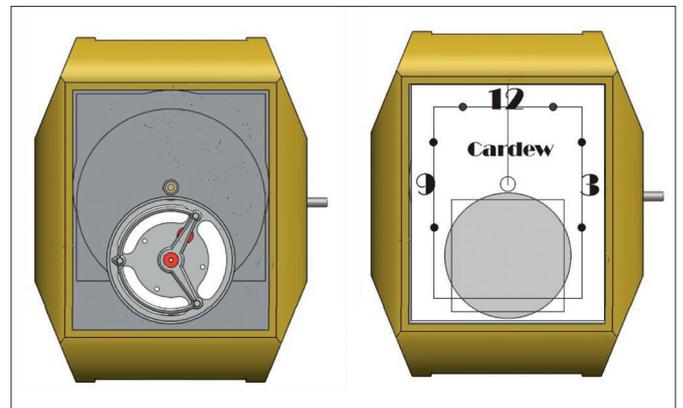


Figure 1.



Figure 2.



Figure 3.

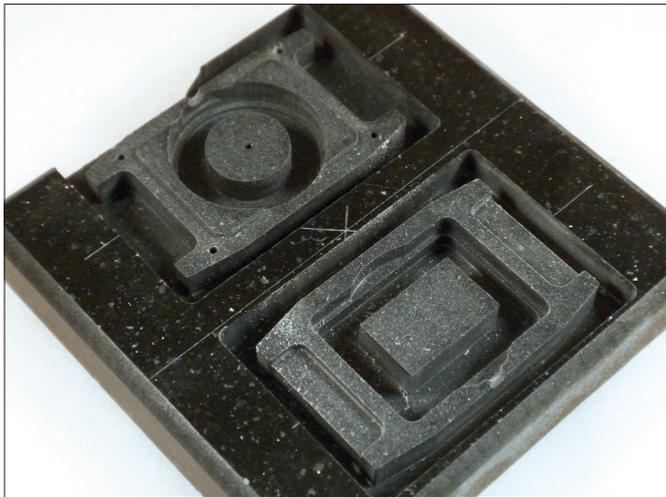


Figure 4.

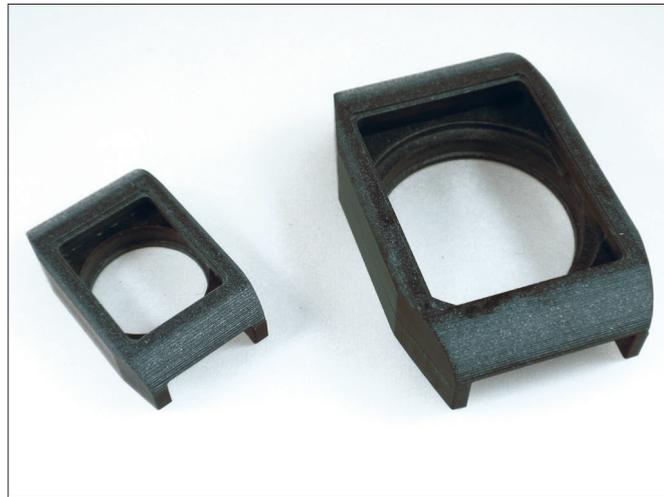


Figure 5.

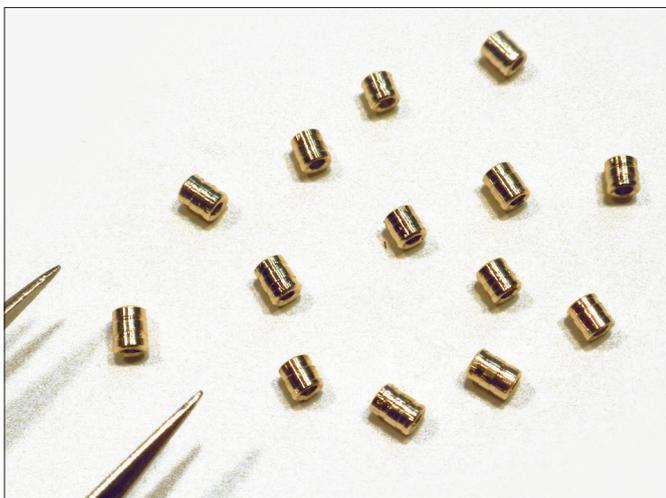


Figure 6.

All design work and manufacturing was to be carried out in my workshop where possible. The cases, dials and other parts were all made from raw materials and the movements were both re-finished, with many parts either being modified or re-made.

Case Design and Making

The cases were designed using 3D CAD and then machined using a small CNC miller engraver that I owned at that time. They were initially made with wax; this enabled me to mock up the shapes and size for approval. I sketched paper dials to simulate the overall appearance, **Figure 2**.

When the case shape and styling were approved in wax, I machined a pair of prototypes in a similar material to that of the final. This allowed me to check the tolerances and fit of the proposed movements, thus proving that the case designs were viable and allowed for final tweaking of sizes for the movements, **Figure 3**.

The final material was then cut using tungsten carbide cutters. **Figures 4 and 5** show the cut case bodies and the final cases before polishing.

The front and back were held together using a matrix of 0.7mm screws. Although the material is capable of taking a thread, stripping was always going to be a concern. So I



Figure 7.

chose to make a number of threaded brass inserts, **Figure 6**, and bond these into the front mouldings. The front and back were naturally aligned by the raised sections within the back design. This ensured there was no lateral sideways movement.

The machined cases were then hand finished and polished. This was a long process; the material is capable of carrying a high gloss but required successive finishing in finer and finer grades of abrasive paper. Finally the parts were finished with polishing paste, **Figure 7**.

The final watches had to reflect the occasion, so as well as the case material having 'silver' specks embedded, a silver



Figure 8.

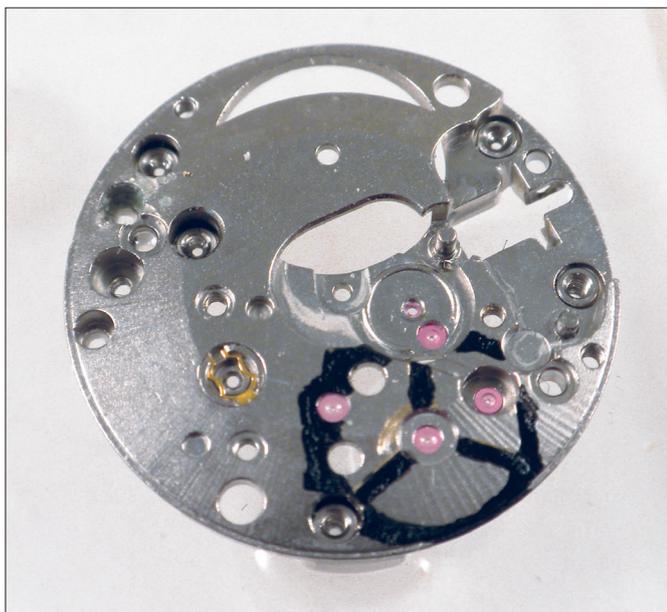


Figure 9.



Figure 10.

ring representing wedding rings was made for each rear case housing the sapphire rear glass. Each ring was bonded into the back of the cases. This also provided a neat contrast to the gold plated movements, **Figure 8**.

Movement Work

Two movements were chosen. The lady's was based on a Tissot 709-2. This is a 17 jewel, 19800 beats per hour, manual wind calibre. It has a movement diameter of 15.3 mm, with a thickness 3.2mm. The escapement area needed to be cut-out so that the moving escape wheel could be seen from the front of the watch.

Figure 9 shows my initial markings on the lady's movement, ready to cut out for the visible escapement. This was carefully done, leaving three spokes to reflect that of the gentleman's tourbillon cage. **Figure 10** then shows this after cutting, but before polishing. Clearly, escapement files helped to shape the cutouts, but final polishing of the edges required an abrasive, soaked cotton thread to the work in the corners, **Figure 11**. The movement was then thoroughly cleaned and re-finished, decorated and finally 18ct gold plated, **Figures 12 to 14**.

The gentleman's tourbillon was based on a DG8101 calibre. This is a 28 jewel, 21600 beats per hour, automatic wind, tourbillon. It has a movement diameter of 30mm, with a thickness 6.7mm. Several parts needed re-making, the most obvious being the automatic mechanism rotor. All parts required to be finished.

The automatic rotor needed to be re-made and I machined it in brass, **Figures 15 and 16**. I had this laser etched to mark the anniversary. Laser marking can give a sharp text on most materials, but on polished brass I have found that it can also give a dulled text which was exactly what I required since I did not want the writing to 'shout' on the rotor, **Figure 17**.

The tourbillon and carriage required special attention, since like a number of Chinese movements I have worked on, it was not well finished. However, I find that parts can be worked on and finished to a very acceptable standard, with care, **Figures 18 and 19**. The movement was then thoroughly cleaned and re-finished, decorated and then 18ct gold plated to match its partner, **Figures 20 and 21**.

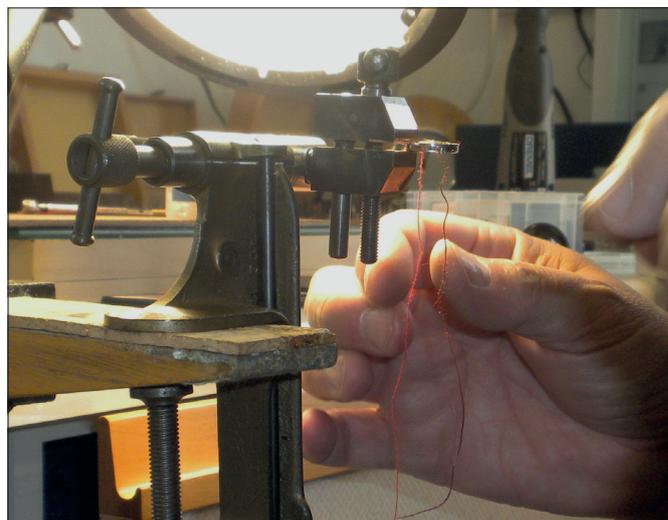


Figure 11.



Figure 12.



Figure 13.



Figure 14.

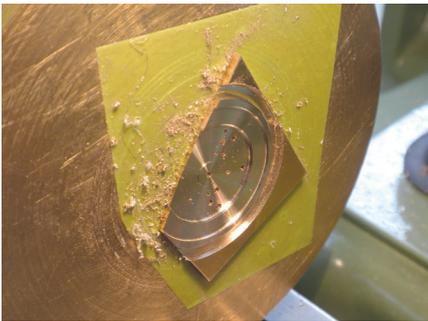


Figure 15.

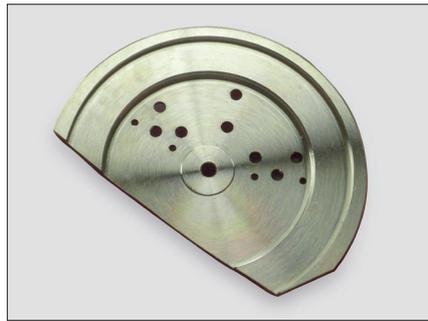


Figure 16.



Figure 17.



Figure 18.



Figure 19.

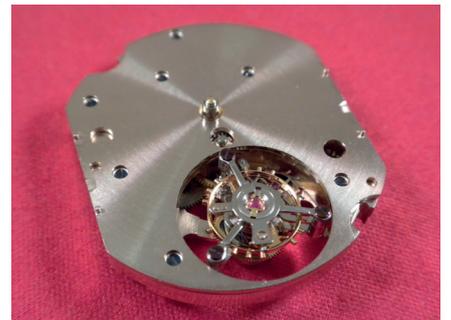


Figure 20.



Figure 21.



Figure 22.

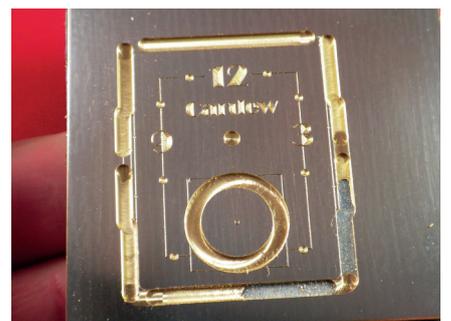


Figure 23.



Figure 24.

The Dials

These are a very important visual part of the watches. However, in keeping with the design brief, they had to be clean and not overly extravagant. The simple design using an Art Deco style font and a linear outline was agreed on paper. There were many attempts to produce this in practice, including using silvered brass, black transfer lettering and laser etching, none of which produced the quality or sharpness of finish I required.

However, during the time I was making these watches I had taken delivery of a new CNC milling machine. While practising with this I discovered that I could engrave very accurate and detailed lettering using a diamond drag tool, **Figure 22**. The final dials were achieved. I engraved on silvered brass the requested Art Deco font, producing very sharp and pleasing lettering, **Figures 23 and 24**.



Figure 25.

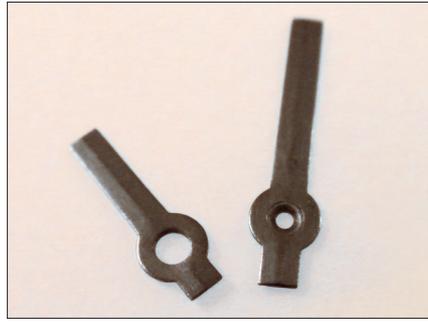


Figure 26.

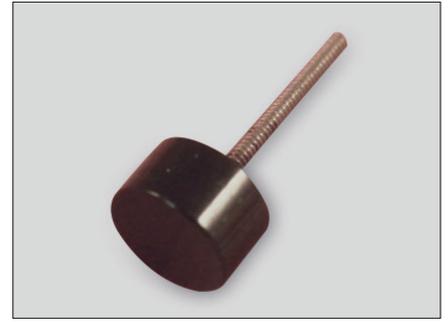


Figure 27.

Holding the dials to the movement is always a problem. Conventional methods of having pins soldered on to the reverse of the dial which locate into holes in the movement are not always satisfactory. The location is often not accurate and mounting the pins to the reverse can discolour the dial, requiring the dial to be re-finished. I prefer to screw the dial directly to the movement if possible. Sometimes this requires the screws to be visible which, when carefully placed, I think can add to the design. In this instance, however, I was able to hide the screws under the front section of the case, this being square. The hands were made from ones that I had in stock, shaped, polished and then chemically greyed, **Figures 25 and 26**.

Other Parts

The initial concept had not paid much attention to the buttons and my early builds had gold plated crowns on each watch. However, during a review it was suggested that the buttons be made from the same material as the case. This led to a very minimal design, wholly in keeping with the Art Deco style. Although it meant that the buttons were slightly difficult to grip when winding, it was felt that this was a minor inconvenience when compared with the improved look of the final timepiece, **Figure 27**.

The rear glasses of the watches were readily available: round flat sapphire. However, I was unable to obtain sapphire

blanks of the appropriate size for the front glasses, so I had to make these from blank mineral glass. I have no glass cutting machines, so it was done by hand. I scored the blanks using a diamond scribe to approximately the correct size, then using a diamond lap I finished the glass underwater. This takes patience, since if you are tempted to cut too much or file out of water you risk the glass chipping. With care, however, the glass can be shaped and bevelled to fit the case. The final product was then bonded into the case using UV curing adhesive.

The straps for both were always to be leather. We chose matching black soft leather with silver buckles for each watch. I managed to obtain a wooden 'His & Hers' watch box in which to place them both. I lacquered and lined it and affixed an engraved silver plaque. The final watches were housed in a presentation box as a pair, **Figure 28**.

The completed movements each went through long term timing and five position tests. Both watches were completed within 12 months and delivered by hand to the proud owners on the Isle of Man, well in time for their anniversary.

Final Note

I spent more than 300 hours creating these watches, in the evenings and weekends. It is easy to think that when creating a watch, each part is made then that's it, job done. Nothing can be further from the truth. Many parts had to be made at least twice, either because the finished part was not to the quality I wanted, some minor defect was noticed in the material which would have spoiled the final finish, or because there was a momentary lapse of concentration and ... whoops, lost it! So I thought I would conclude by showing a picture of some of these mishaps in my 'oops box', **Figure 29**.



Figure 28.



Figure 29.

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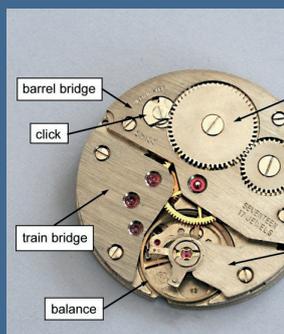
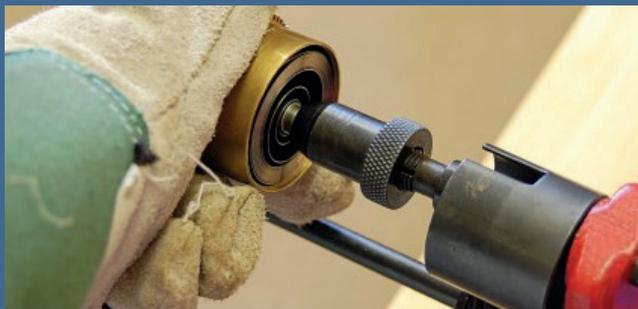
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