

# Legacy Machine Perpetual

MB&F

*Reinventing the  
perpetual calendar*







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### MB&F – Genesis of a concept laboratory

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# Legacy Machine Perpetual



## Summary

First launched in 2015, the LM Perpetual has been since crafted in red gold, platinum, white gold, titanium, yellow gold and palladium. In 2023, a new variation joins the family – the LM Perpetual Stainless Steel, carrying a rich salmon-coloured plate. The steel and salmon combination being a first for MB&F. The new edition also inherits the ergonomic corrector pushers first seen on the LM Perpetual EVO editions.

Beginning with a blank sheet of paper, MB&F and independent Irish watchmaker Stephen McDonnell have completely reinvented that most traditional of horological complications: the perpetual calendar. The result is Legacy Machine Perpetual, featuring a visually stunning in-house movement – developed from the ground up to eliminate the drawbacks of conventional perpetual calendars.

The fact that the new complication looks sensational and can be fully appreciated dial-side is just one of the many benefits offered by the new movement, controlled by a mechanical processor.

LM Perpetual features a fully integrated 581-component calibre – no module, no base movement – with a revolutionary new system for calculating the number of days in each month. And it holistically reinterprets the aesthetics of the perpetual calendar by placing the full complication on dial-free display underneath a spectacular suspended balance.

The perpetual calendar is one of the great traditional complications, calculating the apparently random complexity of the varying numbers of days in each month – including the 29 days in February during leap years. But traditional perpetual calendars do have a few drawbacks: dates can skip; they are relatively easy to damage if adjusted while the date is changing; and the complications are usually compromises of modules powered by base movements.

The fully integrated, purpose-built movement of Legacy Machine Perpetual has been designed from scratch for trouble-free use: no more skipping dates or jamming gears, and the adjuster pushers automatically deactivate when the calendar changes, so no problems there either!

Traditional perpetual calendar mechanisms use a 31-day month as the default and basically “delete” superfluous dates for the months with fewer days – by fast-forwarding through the redundant dates during

changeover. A traditional perpetual calendar changing from February 28 to March 1 scrolls quickly through the 29<sup>th</sup>, 30<sup>th</sup> and 31<sup>st</sup> to arrive at the 1<sup>st</sup>.

LM Perpetual turns the traditional perpetual calendar system on its head by using a “mechanical processor” instead of the conventional space-consuming grand levier (big lever) system architecture. The mechanical processor utilises a default 28-day month and adds extra days as required. This means that each month always has the exact number of days required; there is no fast-forwarding or skipping redundant days. And while the leap year can only be set on traditional perpetual calendars by scrolling through up to 47 months, LM Perpetual has a dedicated quickset pusher to adjust the year.

With its open dial revealing the full complication and suspended balance, it's the harmonious mechanical beauty of LM Perpetual that really steals the show. And in an interesting technical twist, that eye-catching balance hovering on high is connected to the escapement on the back of the movement by what is likely to be the world's longest balance staff.

Using an innovative system developed especially for Legacy Machine Perpetual, the subdials appear to “float” above the movement with no visible attachments. The skeletonised subdials rest on hidden studs, which is technically impossible with traditional perpetual calendar mechanisms because they would block the movement of the grand levier.

Taking a clockwise tour of the dial, at 12 o'clock we see the hours and minutes nestled between the elegant arches of the balance; day of the week at 3 o'clock, power reserve indicator at 4 o'clock, month at 6 o'clock, retrograde leap year indicator at 7 o'clock, and date at 9 o'clock.

The Legacy Machine Perpetual won the Best Calendar Watch Prize at the GPHG (Grand Prix d'Horlogerie de Genève) in 2016.







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## Inspiration and realisation

The Legacy Machine collection was conceived when MB&F owner and creative director Maximilian Büsser started fantasising. "What would have happened if I had been born in 1867 instead of 1967? In the early 1900s the first wristwatches appear, and I would want to create three-dimensional machines for the wrist, but Grendizers, Star Wars, and fighter jets would not have been around for my inspiration. But I do have pocket watches, the Eiffel Tower, and Jules Verne, so what might my 1900s machine look like? It has to be round and it has to be three-dimensional." The result of this was Legacy Machine No.1, first launched in 2011 – followed later by LM2 and LM101.

The LM Perpetual project began with a meeting between Maximilian Büsser and Northern Irish watchmaker Stephen McDonnell. McDonnell had been a long-time friend of the brand and played an instrumental role in the realisation of MB&F's very first timepiece, Horological Machine No.1. As Büsser was thinking of developing a perpetual calendar for the fourth watch in the Legacy Machine collection, McDonnell replied that he had an idea for a perpetual calendar that addresses many of the drawbacks associated with conventional examples.

Three years and a great many sleepless nights later, Legacy Machine Perpetual was born.

## Conventional perpetual calendars

Conventional perpetual calendars are generally modules comprising the complication, which is fitted on top of an existing movement. The calendar indications are synchronised by a long lever (in French: grand levier) running across the top of the complication and passing through the centre. As the date changes, this long lever transmits information to the appropriate components and mechanisms by moving backwards and forwards.

The existence of the grand levier means that there can be nothing in the centre of the complication that might impede it – like a suspended balance with its staff running right down through the centre of the movement to an escapement on the back.

This lever also means that perpetual calendars require a full dial, which may have cut-outs or windows, as it is impossible to support subdials with studs because they would block the motion of the big lever mechanism.

In the traditional grand levier system, perpetual calendars assume that, by default, all months have 31 days. At the end of months with less than 31 days, the mechanism quickly skips through the superfluous dates before arriving at the 1st of the new month. Any manipulation or adjustment of the date during changeover can result in damage to the mechanism, requiring expensive repairs by the manufacturer. The dates can also jump or skip during changeover, negating the whole point of the perpetual calendar in the first place, which is not requiring adjustment for years. Or decades.

*"I call perpetual calendars boomerang watches because they come back for repair so often," says Maximilian Büsser. "The mechanisms jam, block, break, or jump days when they shouldn't."*



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## Mechanical processor

Legacy Machine Perpetual uses a “mechanical processor” consisting of a series of superimposed disks. This revolutionary processor takes the default number of days in the month at 28 – because, logically, all months have at least 28 days – and then adds the extra days as required by each individual month. This ensures that each month has exactly the right number of days. There is no “skipping over” redundant days, so there is no possibility of the date jumping incorrectly.

Using a planetary cam, the mechanical processor also enables a quick setting of the year so that it displays correctly in the four-year leap year cycle, whereas traditional perpetual calendar mechanisms require the user to scroll through up to 47 months to arrive at the right month and year.

The mechanical processor also enables an inbuilt safety feature that disconnects the quickset pushers during the date changeover, eliminating any risk of damage while the date is changing.

While the conception and development of this mechanical processor-controlled perpetual calendar complication is a noteworthy achievement in itself, Stephen McDonnell went even further by managing to place all 581 components of the movement in virtually the same-sized case as LM1.

## Opening up a new world of perpetual calendar aesthetics

Doing away with the calendar’s big lever has allowed for completely new aesthetics not possible when conventional systems are in use. MB&F’s mechanical processor enables the centre of the complication to be used, thereby saving space and allowing design freedom as the full dial is no longer necessary.

Legacy Machine Perpetual takes advantage of its fully integrated movement to place the perpetual calendar mechanism on top of the movement main plate so that it can be appreciated from above. Legibility is often an issue with perpetual calendars due to the sheer number of indications, and LM Perpetual addresses this by using skeletonised subdials (except for the time indication) that appear to float above the complication with no apparent support from below.



## Balance above, escapement below

In yet another innovation, Legacy Machine Perpetual uses what is likely to be the world’s longest balance wheel pinion to connect that elegantly suspended balance, hovering above the top of the movement, to the escapement on the back of the movement. Ensuring the practicality and reliability of this approach was essential before any other development work began.

While the view through the display back is animated by the escapement, it’s the spectacular hand-finishing of the bridges and plates that really captivates the eye.

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## Technical details

Legacy Machine Perpetual is available:

- in platinum 950 with blue face (limited to 25 pieces);
- in 18k red gold with grey face (limited to 25 pieces);
- in 18k white gold with purple face (limited to 25 pieces);
- in 18k white gold with dark grey face;
- in grade 5 titanium with green face (limited to 50 pieces);
- in 18k yellow gold with blue face (limited to 25 pieces);
- in palladium 950 with aquamarine face (limited to 25 pieces);
- in stainless steel with salmon face.

## Engine

Fully integrated perpetual calendar developed for MB&F by Stephen McDonnell, featuring dial-side complication and mechanical processor system architecture with inbuilt safety mechanism. Manual winding with double mainspring barrels. Bespoke 14 mm balance wheel with traditional regulating screws visible on top of the movement. Superlative hand finishing throughout respecting 19<sup>th</sup> century style; internal bevel angles high-lighting hand craft; polished bevels; Geneva waves; hand-made engravings.

Power reserve: 72 hours

Balance frequency: 18,000bph / 2.5Hz

Number of components: 581

Number of jewels: 41

## Functions/indications

Hours, minutes, day, date, month, retrograde leap year and power reserve indicators

## Case

Material: 18k 5N+ red gold, 18k white gold, 18k 3N yellow gold, platinum 950, grade 5 titanium, palladium 950 or stainless steel.

Dimensions: 44 mm x 17.5 mm

Number of components: 69 components

Water resistance: 30 m / 90' / 3 ATM

## Sapphire crystals

Sapphire crystals on top and display back treated with anti-reflective coating on both faces.

## Strap & buckle

Black, grey, brown or blue hand-stitched alligator strap with gold / platinum / titanium or stainless steel folding buckle matching case material.

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# Legacy Machine Perpetual



## 'Friends' responsible for Legacy Machine Perpetual

**Concept:** Maximilian Büsser / MB&F

**Product design:** Eric Giroud / Through the Looking Glass

**Technical and production management:** Serge Kriknoff / MB&F

**Movement design and finish specifications:** Stephen McDonnell and MB&F

**Movement development:** Stephen McDonnell and MB&F

**R&D:** Julien Peter, Pierre-Alexandre Gamet and Robin Cotrel / MB&F

**Methods and laboratory:** Maël Mendel and Anthony Mugnier / MB&F

**Wheels, pinions, movement, axis component:** Paul-André Tendon / Bandi, Daniel Gumy / Decobar, Le Temps Retrouvé and Swiss Manufacturing

**Balance wheel bridge and plates:** Benjamin Signoud / AMECAP

**Balance wheel:** Precision Engineering

**Balance spring:** Stefan Schwab / Schwab-Feller

**Bridges:** Rodrigue Baume / HorloFab

**Perpetual calendar parts:** Alain Pellet / Elefil Swiss

**Hand-engraving of movement:** Glypto

**Hand-finishing of movement components:** Jacques-Adrien Rochat and Denis Garcia / C-L Rochat, DSMI

**PVD-treatment:** Pierre-Albert Steinmann / Positive Coating

**Movement assembly:** Didier Dumas, Georges Veisy, Anne Guiter, Emmanuel Maitre, Henri Porteboeuf,

Mathieu Lecoultre and Amandine Bascoul / MB&F

**After-Sales service:** Thomas Imberti / MB&F

**In-house machining:** Alain Lemarchand, Jean-Baptiste Prétot and Stéphanie Carvalho / MB&F

**Quality Control:** Cyril Fallet and Jennifer Longuepez / MB&F / MB&F

**Case:** Alain Lemarchand, Jean-Baptiste Prétot and Romain Camplo / MB&F

**Gold ingots CoC (Chain of Custody):** Jean-Philippe Chételat / Cendres et Métaux

**Case decoration:** Bripoli, FIFAJ Horlogerie, Termin'hor

**Dial:** Hassan Chaïba and Virginie Duval / La Montre Hermès SA

**Buckle:** G&F Chatelain

**Crown and correctors:** Cheval Frères

**Hands:** Waeber HMS

**Sapphire crystals:** Econorm

**Strap:** Multicuirs

**Presentation box:** Olivier Berthon / SoixanteetOnze

**Production logistics:** David Lamy, Ashley Moussier, Fanny Boutier, Mélanie Ataïde, Thibaut Joannard and Maryline Leveque / MB&F

**Marketing & Communication:** Charris Yadigaroglou, Vanessa André, Arnaud Légeret, Paul Gay and Talya Lakin / MB&F

**Graphic design:** Sidonie Bays / MB&F

**M.A.D.Gallery:** Hervé Estienne and Margaux Dionisio Cera / MB&F

**Sales:** Thibault Verdonckt, Virginie Marchon, Cédric Roussel, Jean-Marc Bories and Augustin Chivot / MB&F

**Texts:** Ian Skellern / Quill & Pad

**Product photography:** Laurent-Xavier Moulin and Alex Teuscher

**Film:** Marc-André Deschoux / MAD LUX

**Portrait photography:** Régis Golay / Federal

**Website:** Stéphane Balet / Ideative

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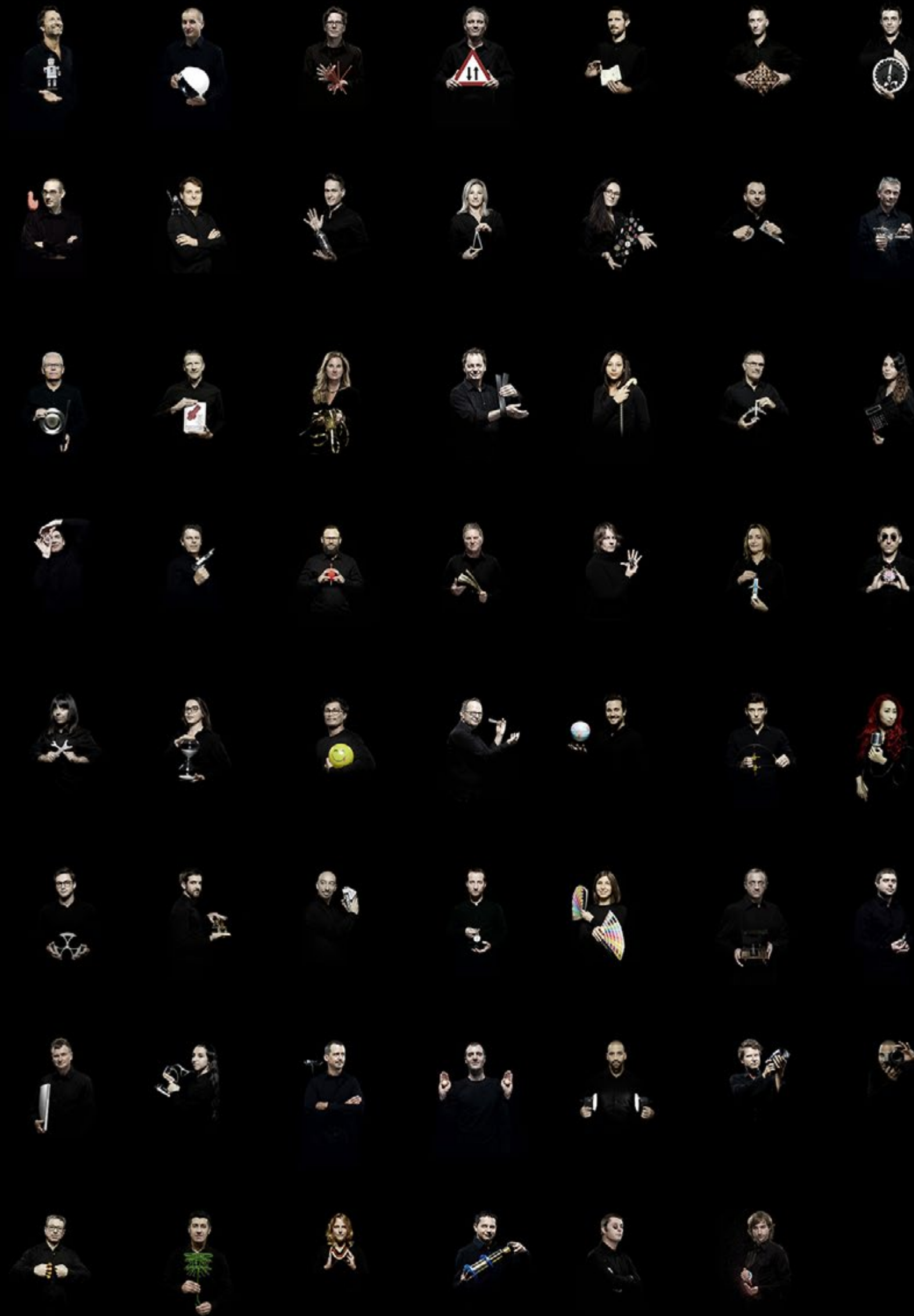
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MB&F







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## Stephen McDonnell - biography

Stephen McDonnell was born in Belfast, Northern Ireland in 1972. He has been interested in watchmaking ever since he remembers, tinkering and "repairing" his grandfather's clocks as a precocious four-year-old. While growing up, McDonnell's passion - which he describes more as an addiction - never abated, however as watchmaking was not a particularly well-known career path in Northern Ireland, he always thought that it would remain a hobby while he worked in another field.

After completing a degree in theology at Oxford University, McDonnell returned to Belfast and gradually fell into repairing clocks for a number of watch and clock shops. This led to the realisation that watchmaking might well be a career after all. After completing a one-week Rolex course - until then his experience had been virtually exclusively with clocks - McDonnell moved to Neuchâtel, Switzerland in 2001 to do a six-month course at WOSTEP (Watchmakers of Switzerland Training and Educational Program). Upon completion, he was offered an instructor position at WOSTEP, which he held until 2007 when he decided to set up as an independent watchmaker.

McDonnell became an accomplished, though self-taught, movement designer, which provided him with a very rare skill set as watch constructors rarely have hands-on practical watch experience.

McDonnell moved back to Belfast with his wife and two children in 2014. He now works from his own comprehensively-equipped workshop, enabling him to make anything he needs for prototyping. An absolute horological perfectionist, McDonnell likes to control all aspects of the development process from conception through to 3D design, construction, the creation of technical plans, and prototyping.

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## MB&F – Genesis of a concept laboratory

Founded in 2005, MB&F is the world's first-ever horological concept laboratory. With almost 20 remarkable calibres forming the base of the critically acclaimed Horological and Legacy Machines, MB&F is continuing to follow Founder and Creative Director Maximilian Büsser's vision of creating 3-D kinetic art by deconstructing traditional watchmaking.

After 15 years managing prestigious watch brands, Maximilian Büsser resigned from his Managing Director position at Harry Winston in 2005 to create MB&F – Maximilian Büsser & Friends. MB&F is an artistic and micro-engineering laboratory dedicated to designing and crafting small series of radical concept watches by bringing together talented horological professionals that Büsser both respects and enjoys working with.

In 2007, MB&F unveiled its first Horological Machine, HM1. HM1's sculptured, three-dimensional case and beautifully finished engine (movement) set the standard for the idiosyncratic Horological Machines that have followed – all Machines that tell the time, rather than Machines to tell the time. The Horological Machines have explored space (HM2, HM3, HM6), the sky (HM4, HM9), the road (HM5, HMX, HM8) and the animal kingdom (HM7, HM10).

In 2011, MB&F launched its round-cased Legacy Machine collection. These more classical pieces – classical for MB&F, that is – pay tribute to nineteenth-century watchmaking excellence by reinterpreting complications from the great horological innovators of yesterday to create contemporary objets d'art. LM1 and LM2 were followed by LM101, the first MB&F Machine to feature a movement developed entirely in-house. LM Perpetual, LM Split Escapement and LM Thunderdome broadened the collection further. 2019 marked a turning point with the creation of the first MB&F Machine dedicated to women: LM FlyingT; and MB&F celebrated 10 years of Legacy Machines in 2021 with the LMX. MB&F generally alternates between launching contemporary, resolutely unconventional Horological Machines and historically inspired Legacy Machines.

As the F stands for Friends, it was only natural for MB&F to develop collaborations with artists, watchmakers, designers and manufacturers they admire.

This brought about two new categories: Performance Art and Co-creations. While Performance Art pieces are MB&F machines revisited by external creative talent, Co-creations are not wristwatches but other types of machines, engineered and crafted by unique Swiss Manufactures from MB&F ideas and designs. Many of these Co-creations, such as the clocks created with L'Epée 1839, tell the time while collaborations with Reuge and Caran d'Ache generated other forms of mechanical art.

To give all these machines an appropriate platform, Büsser had the idea of placing them in an art gallery alongside various forms of mechanical art created by other artists, rather than in a traditional storefront. This brought about the creation of the first MB&F M.A.D. Gallery (M.A.D. stands for Mechanical Art Devices) in Geneva, which would later be followed by M.A.D. Galleries in Taipei, Dubai and Hong Kong.

There have been distinguished accolades reminding us of the innovative nature of MB&F's journey so far. To name a few, there have been no less than 9 awards from the famous Grand Prix d'Horlogerie de Genève, including the ultimate prize: the "Aiguille d'Or", which rewards the best watch of the year. In 2022, the LM Sequential EVO was awarded the Aiguille d'Or, while the M.A.D.1 RED won the 'Challenge' category. In 2021, LMX won the Best Men's Complication and the LM SE Eddy Jaquet 'Around The World in Eighty Days' was awarded in the 'Artistic Crafts' category. In 2019, the prize for Best Ladies Complication went to the LM FlyingT; in 2016, LM Perpetual won the Best Calendar Watch award; in 2012, Legacy Machine No.1 was awarded both the Public Prize (voted for by horology fans) and the Best Men's Watch Prize (voted for by the professional jury). In 2010, MB&F won Best Concept and Design Watch for the HM4 Thunderbolt. In 2015 MB&F received a Red Dot: Best of the Best award – the top prize at the international Red Dot Awards – for the HM6 Space Pirate.

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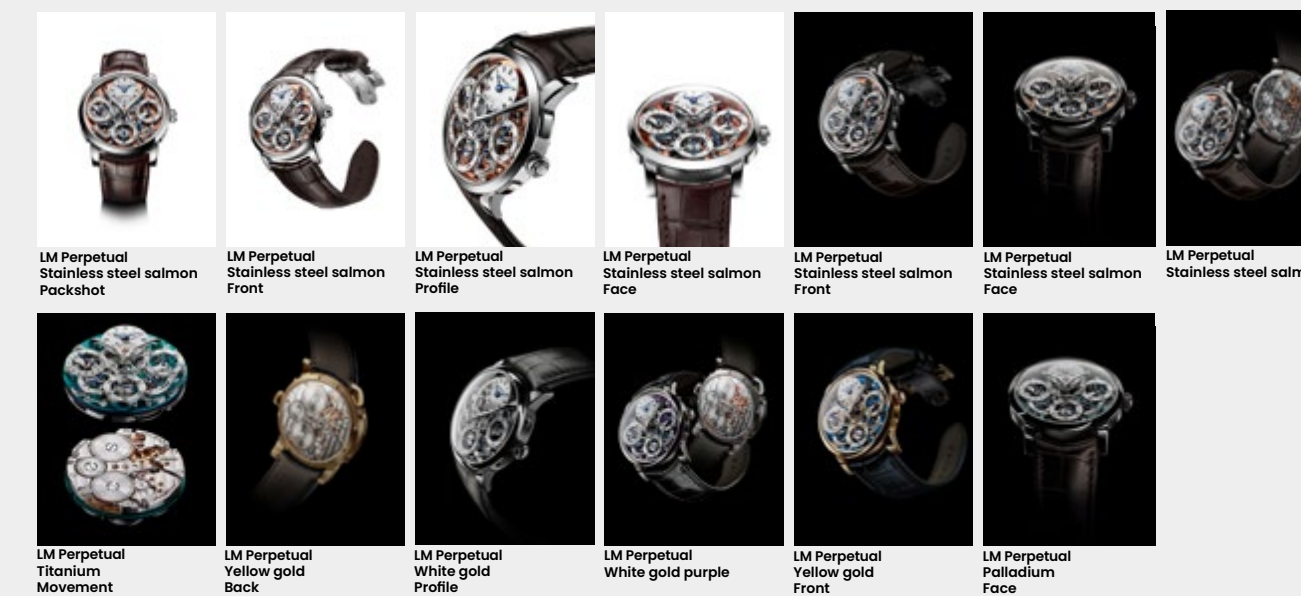
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[www.mbandf.com](http://www.mbandf.com)

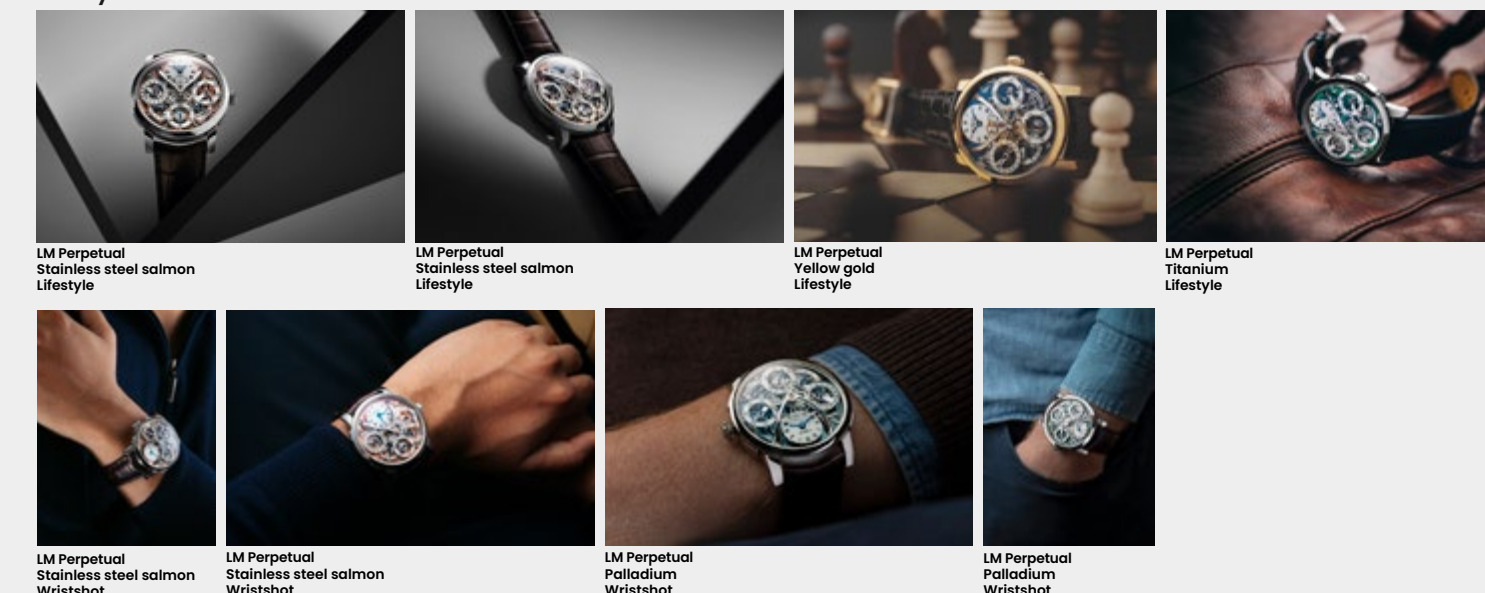
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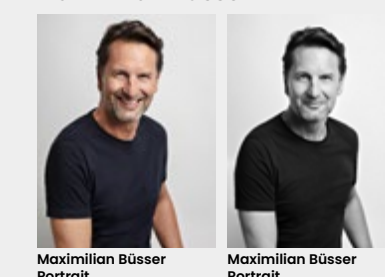
### The machine



### Lifestyle



### Maximilian Büsser



Maximilian Büsser  
Portrait

Maximilian Büsser  
Portrait

### The Friends



Stephen McDonnell  
Portrait

Friends  
Portrait

Friends  
Landscape



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