

# Ferdinand Berthoud

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OLIVIER MÜLLER

## The Ferdinand Berthoud exception

**K**arl-Friedrich Scheufele is just as amazed as he was on day one of the Ferdinand Berthoud adventure. Nonetheless, the initial encounter between the experienced entrepreneur and the historical watchmaker was coincidental: “It was when we acquired our very first Berthoud clock for our museum’s collection of maritime timepieces that I discovered this renowned watchmaker. Everything about him fascinated me. He was a visionary, an accomplished horologist, but also a scientist, with a constant desire to pass on his expertise through the many treatises he left us”, explains Karl-Friedrich Scheufele.

The task was however a bold one. Bringing a defunct watchmaking name back into the limelight is a contemporary undertaking that is as common... as it is often unsuccessful. “That was not my approach at all”, he continues. “I was not particularly looking for a name to revive. It was the whole Berthoud adventure that appealed to me and continues to do so. We are still learning

from his work, which guides us in the creation of our contemporary timepieces, driven by the question we continually ask ourselves: is what we are doing today in keeping with the original Berthoud spirit?”

This question is only one of many, together with numerous doubts. Indeed, who wouldn’t have had them? At this level of complexity, finishing, price and limitation, the endeavor was perilous. “Raising questions is as essential as it is natural”, says Karl-Friedrich Scheufele calmly. “I am a cautious person; I listen to opinions, the market, clients and my teams. This is important in order to make the right decisions, combining prudence and optimism. Above all, I remain an entrepreneur.”

This caution means that Berthoud excellence implies extreme limitations on production. Barely launched at the time of writing, the brand-new FB3 “probably already has about two to three years’ worth of orders” without any particular push being made, a fact that Karl-Friedrich Scheufele admits with almost a hint of embarrassment. Such massive enthusi-



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KARL-FRIEDRICH **SCHEUFELE**

asm among collectors naturally entails certain inherent risks such as that of a speculative bubble based on two well-identified fundamentals: very high prices and excessively small supply. "I am aware of that, yet with the level of finishing and the requirements we have, we simply can't do anything more", as Karl-Friedrich Scheufele tirelessly points out. "We have never done any mechanized finishing and we will not make any exceptions to this rule. Therefore, working on each development requires time and a certain level of expertise – resources that are by definition not unlimited."

To increase the array of competencies available, Chronométrie Ferdinand Berthoud can count on apprenticeships within the Chopard Group. "Every year, two or three promising talents distinguish themselves by their abilities. They will however need a few more years of experience before they can master the requirements for complications such as those of Ferdinand Berthoud."

An adventure in the form of a quest, a passionate and therefore thrilling story, geared towards the long term, and which remains guided by the feeling of "respect and humility" that has prevailed right from the outset, as Karl-Friedrich Scheufele explains. What about the future?

Chronométrie Ferdinand Berthoud will probably gain even greater recognition. Its range of skills is growing in step with collectors' loyalty. "In the vast majority of cases, these are buyers who already have important timepieces and are sensitive to excellence and exclusivity. Even for them however, and despite their increasing numbers, Chronométrie Ferdinand Berthoud does not plan to increase its production. Instead, Karl-Friedrich is thinking about the next stage. Several years ago, the brand acquired an authentic 18<sup>th</sup> century farmhouse in Fleurier, the birthplace of the workshop that now bears its name. "It would be the ideal place to house our teams."

# An exceptional career

**A**s with most historical watchmakers, it is well worth situating Ferdinand Berthoud within his era. His was a nascent Age of Enlightenment: 1727. It is however just as important, if not more so, to position him geographically in Plancemont, in the Val-de-Travers, in the canton of Neuchâtel. This is where the story of a man whose career was to have a profound impact on chronometry took root. For in those days, watchmaking as we now know it did not exist – and of course neither did the wristwatch!

## AN EXTREMELY SWIFT ASCENT

It was as a clockmaker that the young Ferdinand Berthoud became involved in the science of precision. Between 1741 and 1745, he received a scientific education as well as training in this profession, notably from his brother Jean-Henry. The young man went to Paris where he worked with the Le Roy family. This training paved the way for recognition: on 4 December 1753, by a ruling of the King's Council of State and by special favor of the sovereign, Ferdinand Berthoud was awarded his *maîtrise* (master of horology status) and granted the title of *Maître Horloger* (Master Clockmaker) at just 26 years of age.

This status earned him a place in Diderot and d'Alembert's *Encyclopédie*, for which he wrote several articles. Maintaining this momentum, Ferdinand Berthoud published his first work in 1759, *L'Art de conduire et de régler les pendules et les montres, à l'usage de ceux qui n'ont aucune connaissance d'horlogerie* (The art of operating and adjusting clocks and watches for those who have no horological knowledge).







Marine Clock No. 14 by Ferdinand Berthoud, 1775.  
One of the eight chronometers built by the master horologist and delivered to the Spanish Navy.

## ENTERING THE WORLD OF CHRONOMETRY

Five years later, Berthoud took his first steps in the field of chronometry, the term for precision timekeeping. The watchmaker made a marine clock (No. 3) which he took to Brest to supervise the tests performed on it. This step marked a turning point in his career specifically towards marine clocks and in July 1766, King Louis XV financed two new examples (No. 6 and No. 8) of these instruments which sailed to St. Domingo while maintaining remarkable precision.

From then on, Ferdinand Berthoud was given a title specially created for him by the king's council, which placed him de facto at the top of the hierarchy of French watchmakers: *Horloger Mécanicien du Roi et de la Marine* (Clockmaker and Mechanic by appointment to the King and Navy). He enlisted the services of his nephew Pierre-Louis, who traveled from Couvet to join him. The objective was to fulfil a royal order for 20 marine clocks. In 1784, the young man generally referred to as "Louis" was himself granted the title of *élève horloger mécanicien de la marine* (student clockmaker and mechanic by appointment to the Navy). Another nephew, Henry Berthoud, also helped run the workshop. Ferdinand Berthoud became a member of the Institut de France in 1775 and relocated his ateliers to the Louvre.

## AN INVENTIVE LIFE

In Ferdinand Berthoud's time, inventions had to be deposited in a sealed envelope at the Royal Academy of Sciences, thus enabling us to retrace their history. Berthoud was only 25 years old when he deposited his first envelope for an equation clock. Two years later, he submitted his first project for the science that would occupy him for the rest of his life, a "Machine for measuring time at sea", in 1754, followed in 1760 by a "Memorandum on the principles of construction of a Marine Clock" for the famous Marine Clock No. 1, whose construction was completed in 1761.

Ferdinand Berthoud is also the author of a remarkable watchmaking treatise titled *Essai sur l'horlogerie*, translated into several languages and repeatedly reissued until the 19<sup>th</sup> century. He never stopped writing in order to disseminate his work through publications released in 1773, 1775, 1787, 1792, 1796, 1802 and until the year of his death in 1807.

In 1804, Ferdinand Berthoud was awarded the title of *Chevalier de la Légion d'Honneur* by Napoleon Bonaparte. He was the only watchmaker to have published the results of his research in a methodical and detailed manner, making it possible to reproduce his constructions identically.



# FB 1, the philosopher's stone

**I**n 2015, Chronométrie Ferdinand Berthoud unveiled its very first creation, the FB 1. It featured a design model that would guide all of Chronométrie Ferdinand Berthoud's work. This consists first and foremost of a spirit that involved not producing copies of original timepieces, but instead interpreting them from a contemporary perspective. Marine clock no. 6 from 1777 represents one of the main sources of inspiration.

Chronomètre FB 1 is equipped with a mechanical hand-wound movement comprising more than 1,120 components. Entirely developed, crafted and assembled by Chronométrie Ferdinand Berthoud in Fleurier, the FB-T.FC caliber features a low-frequency (3 Hz) tourbillon with a central seconds hand and a constant-force regulating device with suspended fusee-and-chain transmission, i.e. a design that is inverted compared to a traditional construction on a mainplate.

The case of the FB 1 also asserted an aesthetic that was at once every innovative and yet similar to the requirements of Ferdinand Berthoud more than two centuries ago. Measuring 44mm in diameter, it has an octagonal shape and a structure inspired by the marine chronometers designed by the master watchmaker. Its sides feature four water-resistant portholes revealing the movement's gears, while its transparent case-back offers a view of the tourbillon and the suspended fusee-and-chain transmission.

Finally, the FB 1 is chronometer-certified by the COSC (Official Swiss Chronometer Testing Institute) and imposes a very high level of manual finishing, with each piece checked under 6.7x magnification, well above conventional watchmaking standards. The last element of the creative imprint left by the first FB 1 is that it was produced in a strictly limited edition (two 50-piece series).

It received the "Aiguille d'Or" Grand Prix best-in-show award at the *Grand Prix d'Horlogerie de Genève* in 2016.

The collection comprises three major iterations: the first FB 1, the FB 1R (Regulator), and the FB 1L (with moon phases).

The fusee-and-chain transmission of the original movement powering Chronomètre FB1.



The first creation from Chronométrie Ferdinand Berthoud: the FB 1, winner of the "Aiguille d'Or" Grand Prix in the 2016 Grand Prix d'Horlogerie de Genève (GPHG).





## FB 2, the new paradigm

**T**he next model embodied continuity as well as a new chapter very distinct from the previous one. It was in 1770 that Ferdinand Berthoud was granted the title *Horloger-Mécanicien du Roi et de la Marine* and the workshop that now bears his name unveiled a new collection for the occasion. The year 2020 marked the 250<sup>th</sup> anniversary of his accession to this title and offered a unique occasion on which the FB2 was unveiled.

It is inspired by the famous Marine Clock No.6 and the first watch by Chronométrie Ferdinand Berthoud to feature a round case. It houses a modular construction, with the caliber installed in a cylindrical container inspired by clock mechanisms and protected by a cylindrical copper drum, itself held in a horizontal position by a gimbal suspension system invented by the maestro himself.

The apparently understated aesthetic of the dial side conceals an ambitious and particularly complex twin-level construction in enamel. Here again, the inspiration comes from the Marine Clock No. 6, which already displayed the hours in

Roman numerals in its centre, and the minutes in Arabic numerals around the rim. The central section is a flat medallion, while the peripheral part is domed – a particularly difficult task to accomplish with enamel.

On the movement side, hand-wound Caliber FB-RE.FC favors clear and legible symmetry. It comprises 26 bridges held by ten steel pillars surrounding the mechanical parts. This construction is characteristic of Ferdinand Berthoud's 18<sup>th</sup> century marine chronometers. It features fusee-and-chain transmission supplying constant force to the escapement. Exceptionally however, in addition to the constant-force mechanism, Caliber FB-RE.FC is equipped with a one-second *remontoir d'égalité* mechanism visible on the back of the movement. It complements the action of the fusee-and-chain transmission in order to compensate for the irregularities that occur when the teeth mesh. Chronométrie Ferdinand Berthoud has designed it in an atypical way, fitted concentrically with the escape-wheel and thus directly connected to the escapement. To date, the FB2 RE has been produced in four limited editions.

Left: In addition to the constant-force mechanism, Caliber FB-RE.FC is equipped with a one-second *remontoir d'égalité* mechanism, visible on the back of the movement.

Right: Chronometer FB 2RE.2, rose gold case and enamel dial, 10-piece limited edition.





Caliber FB-SPC is based on a cylindrical balance-spring, a very rare watchmaking specialty. It is the only one of its kind to satisfy the precision timing (chronometry) criteria of the COSC.



Chronomètre FB 3SPC.2, rose gold case, 42.3mm

## FB 3, a first in the field of chronometry

**T**oday, Chronométrie Ferdinand Berthoud continues to explore precision watchmaking by addressing its most essential component: the balance-spring. To this end, it relies on work that Ferdinand Berthoud himself undertook, even though the watchmaker never actually used a cylindrical balance-spring for his creations. It was therefore Louis Berthoud who first introduced it in his own models.





Positioned at 9 o'clock, the three main organs of the escapement – the balance, pallet-lever and escape-wheel – are thus individualized, distinct and prominent. This space dedicated to the regulating organ enables the wearer to admire its operation and to see the cylindrical balance-spring beating throughout the three-day power reserve, including through a large water-resistant porthole in the case middle.

## THE COMPLEXITY OF A CYLINDRICAL BALANCE-SPRING

The Berthoud dynasty bequeathed an exceptional timepiece to posterity: decimal watch No. 26. Made by Ferdinand Berthoud's nephew Louis (Pierre-Louis Berthoud, 1784-1813), it is based on a cylindrical balance-spring after which the contemporary timepiece is named: "SPC" (standing for *spiral cylindrique*). As its moniker indicates, it is a vertically deployed balance-spring.

It was by nature perfectly suited to a static longcase or table clock, but proved to be extremely sensitive within a wrist-watch, where the balance-spring is left to its own devices in the face of gravity. It was therefore necessary to define with peerless accuracy – controlled through by a microscope at 20x magnification – the adjustment and points of attachment of the two dedicated curves: one to the balance-wheel; the other where it meets the pin of the balance-bridge. This distinctive geometry of the terminal curves of the balance spring has indeed been named "Berthoud".

## A FLEETING HISTORICAL CONTEXT

The style of the FB 3 is inspired by decimal watch No. 26. The latter emerged within a very special historical context, when the secular and republican calendar, or French revolutionary calendar, was created during the French Revolution. It was used from 1792 to 1806 and 22 September 1792 became 1 Vendémiaire year I of the new calendar. Decimal time was officially introduced in France on 5 October 1793.

The reformers decreed that, from midnight to midnight, the day was divided into ten hours, each in turn split into 100 decimal minutes comprising 100 seconds. A decimal hour was thus equivalent to two hours and 24 seconds. Marine chronometer no.26 made by Louis Berthoud is probably the first one made with this system, which was abolished two years later on 7 April 1795, after only 500 days of use.

## A UNIQUE STYLE

The FB 3SPC is directly inspired by this chronometer that remains in perfect working order at the L.U.CEUM in Fleurier, where Chronométrie Ferdinand Berthoud is also located. This resemblance is visually confirmed by elements such as the curves of the case and sapphire crystal, the architecture of the movement and bridges, the finishing of the piece, and of course its distinctive escapement.

The round case continues the styling work begun in 2020 with the FB 2RE. Its proportions are new: 42mm in diameter, with a particularly modest thickness of only 9.4mm that is minimal for a construction equipped with such an escapement. The latter is in fact visible at 9 o'clock thanks to a lateral sapphire 'porthole' reflecting the inspiration of the first Chronomètre FB 1.

The dial is intended to be minimalist yet results from complex architecture. Reading is facilitated by a traditional layout of the hours and minutes (in the center) and small seconds (at 6 o'clock), complemented by an off-center power reserve (at 2 o'clock). This natural fluidity nonetheless stems from a multi-level dial graced with a wide variety of finishes: polished, satin-brushed, frosted surfaces, domed minutes circle, along with hands designed like those of the 1760 Régulateur model which is also preserved in the Fleurier collections.

## A WATCHMAKING SHOW ON THE BACK

Finally, the construction visible through the caseback is worthy of special attention. It is composed of a carefully orchestrated mosaic of finely adjusted adjacent bridges. Each features the same finish which deserves two remarks. Firstly, the means of achieving it, as this sandblasted finish is very finely frosted. However, unlike modern laser-based techniques, the sandblasting here is achieved with natural sand. This technique that has largely fallen into oblivion relies on the noble touch of the decorating artisan who projects the sand himself and personally appraises each component to determine whether the rendering is satisfactory. This leads to the second remark: the finish of the ten juxtaposed bridges must be perfectly homogeneous. The slightest variation on one of them would immediately make it stand out from the other nine. A result of such absolute constancy could be achieved only by the human hand.

All in all, it takes more than 100 hours to decorate the 230 components of the movement so as to achieve the ultimate degree of perfection characterizing the creations of Chronométrie Ferdinand Berthoud.

Each bridge visible from the back is individually sandblasted by hand, an artisanal technique that had fallen into oblivion but reflects the high standards of Chronométrie Ferdinand Berthoud, for which no finish can be mechanically executed.







Chronomètre FB 3SPC draws its stylistic, technical and aesthetic inspiration from a rare and exceptional creation, decimal watch No. 26 made in 1793 by Louis Berthoud.

### THREE-DIMENSIONAL CONSTRUCTION

The FB 3SPC timepiece is the first to offer such a clear and exhaustive vision of its organs on the dial side. This is made possible by a central mainplate with 16 bridges (six on the dial side, ten on the caseback side). At 12 o'clock, the barrel is held in place by a 120° bridge that resembles the bridge of the No. 2575 quarter-repeater watch made by Louis Berthoud. The driving organ provides three full days of chronometric power reserve, followed by approximately eight additional hours before the movement stops. Another bridge supports the small seconds appearing exactly opposite, at 6 o'clock, secured like all the others by a blued screw.

The most striking feature of the FB 3SPC appears at 9 o'clock, where the regulating organs are visible, secured by four dedicated screw-in heel bridges featuring a typical 18<sup>th</sup> century construction. It is also equipped with a stop-seconds mechanism by means of which as soon as the crown is pulled out, the escape-ment stops in order to enable setting to the nearest second.

At the center of the mechanism sit the large variable-inertia balance-wheel (12mm in diameter) and the cylindrical balance-spring. This masterpiece of meticulous care and development results from two years of work notably devoted to determine the perfect geometry of the terminal curves of the balance-spring. The caliber operates at a low frequency of 3 Hz (21,600 vibrations per hour). It is also to date the world's only tourbillon-free regulating organ with cylindrical balance-wheel to be chronometer-certified by the COSC.

### TWO INITIAL VARIATIONS

Chronomètre FB 3SPC is available in two versions. The first has an 18K white gold case, 2N pale yellow gold movement components and an eggshell-colored dial. The second features an 18K 5N rose gold case and houses black rhodium-plated components and a translucent black patent dial. Their faceted, skeletonized and open-tipped 18K gold hands are inspired by a 1785 Ferdinand Berthoud astronomical regulator in the Chronométrie Ferdinand Berthoud heritage collection in Fleurier.

The production of Chronomètre FB 3SPC is naturally limited by the capacities of the Chronométrie Ferdinand Berthoud workshop in Fleurier, from which a maximum of 25 units per year will emerge. This natural limitation is notably due to the particularly high level of finishing, all of which is checked under 6.7x magnification, twice the standard applied in traditional *Haute Horlogerie*.



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CHRONOMÈTRE FB 35PC.1

The first mechanical movement with a  
cylindrical balance-spring, 72h power reserve  
and chronometer-certified by the COSC.

Case diameter: 42 mm

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