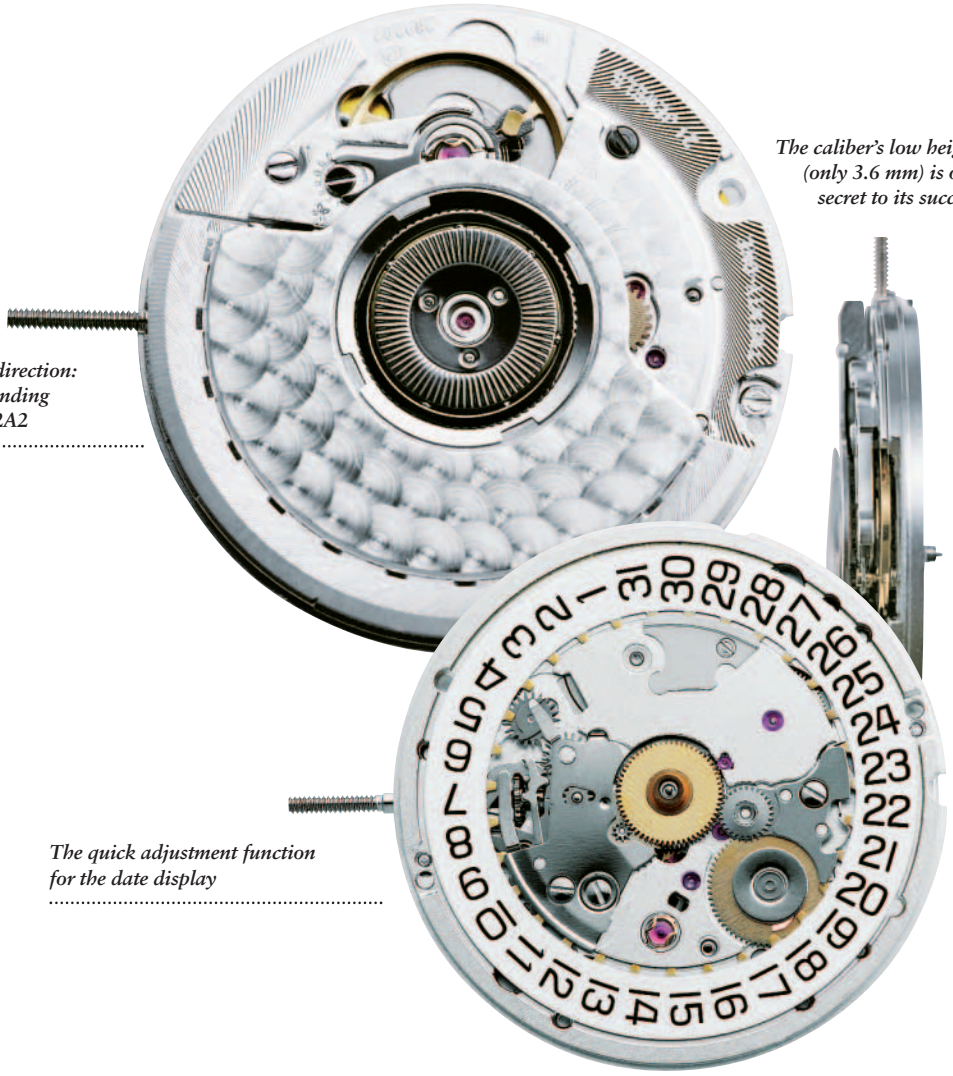
Photo: Masanori Yoshie

Slim, precise, powerful and reliable, ETA's Caliber 2892 has become one of the watch world's most popular mechanical movements and the base for a variety of additional complications.

The Little Engine That Could

BY GISBERT L. BRUNNER



Pointing in the right direction: the bidirectionally winding rotor of the ETA 2892A2

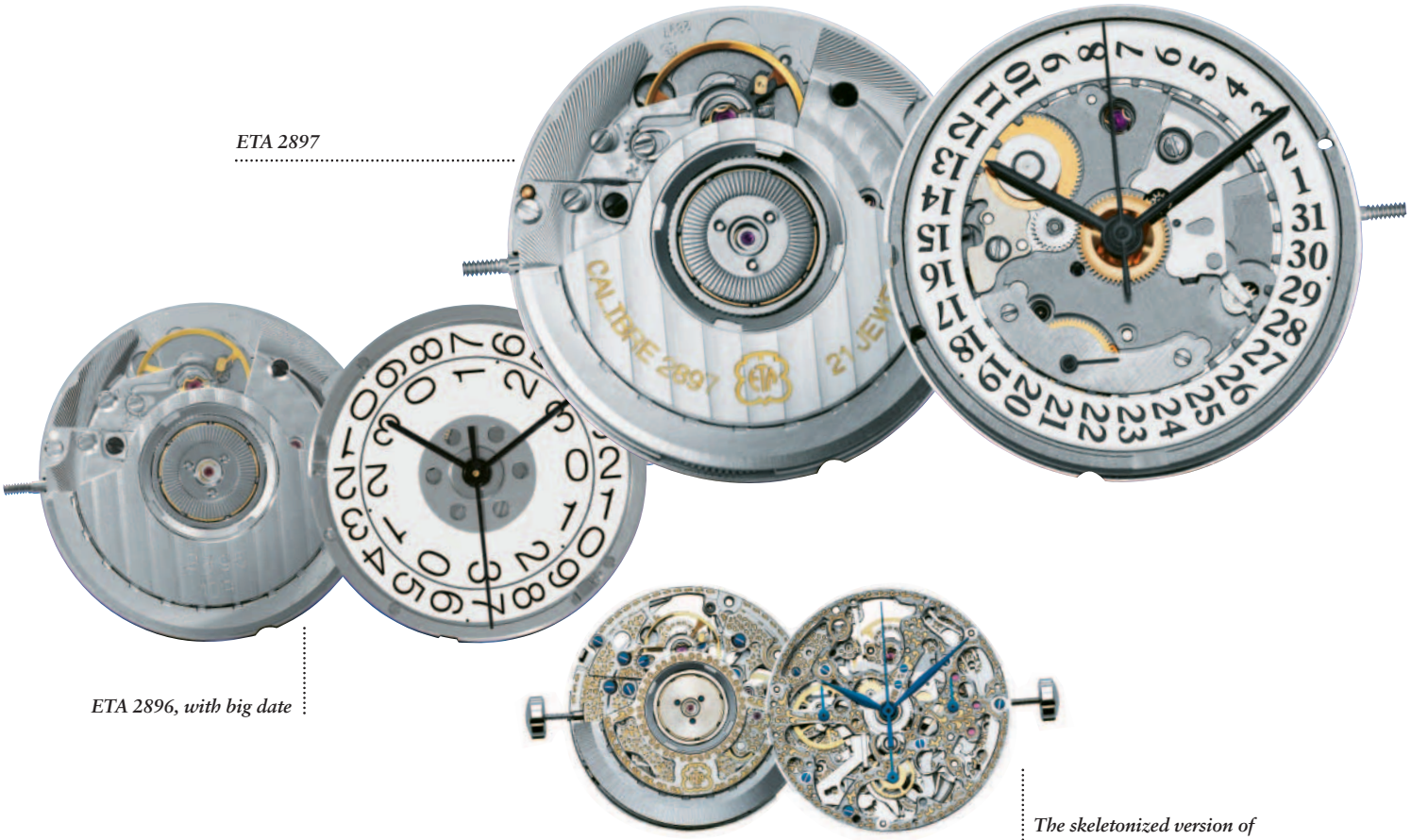
The caliber's low height (only 3.6 mm) is one secret to its success

The quick adjustment function for the date display

Since its launch in 1975, the ETA 2892 has been used in more watches than practically any other mechanical movement of its kind. It brings ticking life to an array of timepieces, both luxurious and affordably priced. The reasons for its popularity no doubt lie in its remarkable reliability, its high degree of precision, and the manifold options it offers its users.

Less well known, however, is this best-selling caliber's long history. Its story began 47 years ago, in 1961, when ETA, then a subsidiary of Eterna, was commissioned to begin designing a caliber for the Eterna-Matic 3000 Dato. (Today, ETA is fully owned by the Swatch Group.)

ETA's chief design engineer at that time was Heinrich Stamm, born in 1898. After completing his technical education, he worked as an instructor from 1938 to 1939 at a professional camp for watchmakers in Bienne, Switzerland. Authorities there had established the facility to help unemployed watchmakers, who had lost their jobs during the global economic crisis, to gradually return to their chosen profession. Along with plenty of administrative tasks, his responsibilities included coordinating the professional work and providing theoretical instruction. The watchmaking course was only three months long, so Stamm had to restrict his teaching to the bare essentials. He put particular focus on the subject of toothing on the wheels of the movements. In the subsequent decades, his devotion to this particular feature would culminate in the invention of the energy-saving "ETA toothing," which was successively integrated into all calibers made by the Grenchen-based ébauche smithy starting in 1950. After the professional camp was disbanded, Stamm worked briefly at the local employment office and for a short time at a small factory in the Jura region of western Switzerland. His career at ETA began on December 16, 1939. Numerous calibers owe their existence to the creativity of the strong-willed Stamm (who was known for his disagreements with his boss, Dr. Rudolf Schild-Comtesse), including the



ETA 2897

ETA 2896, with big date

The skeletonized version of chronograph movement 2894S2

Eterna-Matic with ball-borne rotor (1948) and Eterna-Matic 3000, regarded as the predecessor of Caliber 2892. Stamm retired in 1969. Ten years later, the Swiss Society for Chronometry awarded him a gold medal in recognition of his numerous contributions to horology.

WITH A HEIGHT of just 3.6 millimeters (including the jumping date display below its little window), the Eterna-Matic 3000 was the slimmest caliber with a central rotor. Five factors made this achievement possible: the steeply beveled base movement; the close spacing of all components, without significant reductions in their size, in order to create a tub-shaped empty space; the insertion of the gear train for the self-winding mechanism into this space; the altered profile of the oscillating weight, consisting of a flat plate in the center and a heavy metal segment with stepwise terraces toward its periphery; and a bearing with a large diameter and seven (rather than the previous five) balls, each of which could be reduced in diameter from 65 to 60 1/100 mm.

The combination of all these elements made it possible to reduce the overall height by 25 percent compared to the preceding "Centenaire" family of calibers. The 3.1-mm thickness of the base Caliber 1438 was kept unchanged, but the amount of headroom needed by the rotor and the self-winding assembly could be reduced by half a millimeter. Other distinguishing features include a directly propelled central seconds hand, a minute hand situated outside the flow of force, gears made of beryllium bronze, and curved toothing which, thanks to Stamm, had already been implemented in 1951. This ambitious venture would have been impossible without this special toothing. Furthermore, the watchmakers continued to use the earlier solutions of ratchet-wheels without springs to polarize the rotor's motions and to uncouple

the manual winding when a user winds the mainspring by hand.

A watch repairer need only unscrew three screws to completely remove the inset self-winding assembly from the movement. The technicians inset the number ring and the switching work of the digital date display into a milled indentation on the front of the plate, thus keeping its 3.6-mm height unchanged. Leaving out a central seconds-hand would have saved another 0.3 millimeters, but this option was never seriously considered.

The Eterna-Matic 3000 Dato made headlines when it debuted in 1963. Journalists lauded it as a milestone in watch history, and particularly praised its efficient, low-cost, large-series production. It is fair to say that the new movement (designated Caliber 1466), and the following version (Caliber 1504), with a balance oscillating at a frequency of three hertz (21,600 vph), represented essential steps forward into the modern era of self-winding wristwatches.

THE PROOF is in the astounding success of ETA Caliber 2892, which made its entry onto the watch stage in 1975 — a low point in the history of mechanical timekeeping. The technicians — foremost among them Urs Giger, born in Solothurn, Switzerland in 1929 — had devoted intensive work to the new product and had given it, among its other distinguishing features, a balance that oscillated at a readily controllable frequency of four hertz. These 28,800 hourly semi-oscillations facilitated its regulation and contributed to its ability to maintain its initial precision longer than would have been possible if it had been designed to oscillate at three hertz. While the flood of new quartz watches in the market took its toll on the traditional manufacturers, this 11½-ligne caliber staunchly held high the banner of mechanical timekeeping. Caliber 2892 preserved ETA's tried-and-tested self-winding principles: ball-borne rotor, self-winding gear train with click-wheel reverser to polarize the rotor's motions, service-friendliness thanks to

The ETA 2892 Family

Name	Diameter and Height	Description
2890-9	25.6/5.2 mm	2892-2 without seconds hand; has perpetual calendar with leap-year and moon-phase displays; launched in 1990. 2890 has no perpetual calendar
2891-9	25.6/5.2 mm	Mostly identical with 2890-9 with perpetual calendar, but also has central seconds hand, stop-seconds function; ETA's top-of-the-line caliber; launched in 1990
2893-1	25.6/4.1 mm	Quickly adjustable date display, plus "heure universelle" world-time display, 24 city names on central disk
2893-2	25.6/4.1 mm	Quickly adjustable date display, plus additional 24-hour hand for the time in a second time zone
2893-3	25.5/4.1 mm	2893-1 without date display
2894-2	28.0/6.1 mm	Chronograph mechanism is mounted on the front side and has cam switching, counters for 30 elapsed minutes and 12 elapsed hours, plus date display (quickly adjustable) below the dial; 37 jewels; no module because the switching movement is mounted directly on the front side of the plate; launched in 1996
2894S2	28.0/6.2 mm	Skeletonized chronograph, no date display
2895-2	25.6/4.35 mm	Additional module for the seconds subdial at 6 o'clock
2896	25.6/4.85 mm	Quickly switching big date (two windows) at 3 o'clock; 22 jewels, launched in 2004
2897	25.6/4.85 mm	Displays the date and the remaining power reserve, 21 jewels; launched in 2004

Modules for Caliber 2892 and its Derivatives

Soprod	
2424 for ETA 2893	Date window, power-reserve display at 6 o'clock, adjustable 24-hour display for second time zone
9035	Power-reserve display and adjustable 24-hour display
9055	Displays the day of the week, the remaining power reserve and the time in a second time zone
9075	Displays the remaining power reserve, the day of the week and the week number
TT/651	Big date at 12 o'clock (two windows, two disks), dual-time system (second hour hand and minute hand at 6 o'clock
La Joux-Perret (formerly Jaquet)	
897-5	Date window at 3 o'clock, power-reserve display at the 6 o'clock; used by Bulgari and Panerai
3532	Seconds subdial at 6 o'clock, big date at 12 o'clock
No designating number	Power-reserve display between 1 o'clock and 2 o'clock, exclusively for Baume & Mercier
Dubois Dépraz	
DD 87	Module for five-minute repetition; diameter = 36.2 mm
DD 312	GMT module with additional 24-hour hand in the center and hand-type date display at 6 o'clock, as in Bulgari Diagono Professional GMT
DD 800	Tide module for Corum Admirals Cup
DD 2021	Chronograph module mounted on the front side
DD 2027	Chronograph module (yacht timer): five-minute countdown timer for regattas; for Bulgari, Omega, Audemars Piguet
DD 2071	Chronograph with central counter for 60 elapsed minutes and counter for 12 elapsed hours at 6 o'clock, continually running seconds hand at 3 o'clock, used in Mido Multifort Center-chronograph
DD 4500	Chronograph module with big date (two disks, two apertures in the dial at 12 o'clock)
DD 4900	Modules for four-year calendar and for chronograph, big date (two disks) at 12 o'clock, month display between 4 o'clock and 5 o'clock
DD 7000	Date window at 6 o'clock, power-reserve display at 12 o'clock
DD 9000	Simple full calendar; digital month and day of the week at 12 o'clock, central hand-type date display, moon-phase display at 6 o'clock
No designating number	Caliber FC 610 (Frédérique Constant): aperture in the plate so the balance is visible from the front, concentrically axial hands for the day of the week and date at 6 o'clock
No designating number	Caliber FC 710 (Frédérique Constant): aperture in the plate so the balance is visible from the front, perpetual calendar with leap-year display, skeletonized

modular architecture, and the intelligent decision to minimize the number of components as much as possible. The fully wound caliber amassed a power reserve of 42 hours. Its standard equipment also included an easily adjustable date display, a central seconds hand within the flow of force, an eccentric fine adjustment for the index, a balance-stop function to facilitate to-the-second setting of the hands, a flat Nivarox balance spring, 21 functional jewels and the inviolable height of 3.6 millimeters.

ETA manufactured a total of 342,123 pieces of the original version of the 2892. Compared with the legions of clones of other four-hertz calibers, this third-of-a-million really isn't an especially large number. For example, no fewer than 1.6 million pieces of the ETA 2824 were produced between 1971 and 1979. Earlier self-winding ETA calibers had achieved even larger runs: ETA made 11.3 million pieces of Caliber 2390/91 between 1954 and 1972, and 16 million of Caliber 2450/51 between 1956 and 1974.

In 1983, despite the many economic problems facing the mechanical watch business due to the quartz crisis, ETA introduced a reworked, successor version of the 2892. This caliber, dubbed ETA 2892A2, has since made decisive contributions to the renaissance of mechanical timekeeping. Were it not for this self-winding movement, many well-known watch brands would have found it very difficult to regain a foothold in the market. And without the ETA 2892A2, many small and new watch brands would scarcely have had a chance to survive or succeed.

AN ETA 2892 SAMPLER

1. Bell & Ross BR 01-92 Phantom (ETA 2892)
2. Ebel Brasilia Chrono Gent (ETA 2894)
3. Custos Challenge QP-S (ETA 2892 with perpetual calendar module and palladium/titanium rotor)
4. Anonimo Dino Zei San Marco (ETA 2892 with Soprod module)
5. Arnold & Son True Moon (modified ETA 2893-2)
6. Sinn 1746 Classic ("Top" ETA 2892)
7. Victorinox Dive Master 500 Limited Edition (ETA 2896 with big date)
8. TAG Heuer Carrera Calibre 360 (ETA 2892 with chronograph module)
9. Hanhart Minos (ETA 2895)
10. Carl F. Bucherer Patravi Chronograph Big Date (ETA 2892 with Dubois Dépraz 4500 module)

At a relatively low cost to manufacturers, the ETA 2892A2 is extremely robust and reliable. It offers plenty of watch movement in a small volume of space, as well as ample opportunities to add even more capabilities. As with other self-winding calibers, the list of extras is long and comprehensive. Worlds of difference can separate one 2892A2 from another. ETA offers this caliber in three versions: "Elaboré" with nickel balance, "Top" with Glucydur balance, and "Chronomètre" with Glucydur balance and official chronometer certification. Gold-plated movements and special versions are also available, not to mention

Maurice Lacroix Masterpiece Jours Retrogrades

Why is the ETA 2892 so Popular? Experts Weigh In

"The ETA 2892A2 self-winding mechanical movement is without a doubt the caliber that's used most frequently as a base for the development of complication modules. Produced in large quantity but also with good quality, this movement offers a reliable performance. Furthermore, it's rather slim – one of the slimmest movements in this category. This makes it an ideal base for interesting complications. It satisfies all our demands with regard to stability, quality and industrialization. Analyses conducted by our watchmakers show that we can rely on it to provide the high quality that we insist upon for our own calibers. Thanks to its various advantages, which include high quality, stable performance and low overall height, the ETA 2892 offers plenty of latitude for us to put our own ideas into practice. These reasons are why it's so popular in the watch industry, but this popularity can also cause capacity problems."
— Sandro Reginelli, Product Director, Maurice Lacroix

Breitling Blackbird

"The ETA 2892 has many positive aspects, two of which deserve particular mention: superlative isochronism and small dimensions. This movement's diverse spectrum of modules satisfies the specific requirements that we receive from our R&D division as specifications for each new development. For example, we use the ETA 2892 as the base caliber for a Parsifal model into which we've integrated the power-reserve display as a complication module provided by La Joux-Perret. We're very satisfied with the options offered by this caliber. It fully satisfies our expectations and our demands. One could, however, enlarge the movement's basic size in order to meet the future need for larger watches and thus larger openings."
— Eric Yersin, Technical Director, Raymond Weil

"We use the ETA 2892 as the base movement for approximately 20 of our module movements. Each module is developed with Dubois Dépraz, which produces it exclusively for Breitling. As long ago as the 1960s, Dubois Dépraz already had the idea of always using the same basic movement as the power source. For Breitling, this always meant a chronograph plus additional functions such as a big date, a flyback function, a counter for 30 elapsed seconds for the chronograph, and similar additional functions. The ETA 2892 delivers very high performance in a small package and offers us numerous options."
— Jean-Paul Girardin, Vice-President, Breitling

"The ETA 2892 is a mature movement and it works very reliably. Thanks to its low height, it can be used very flexibly. Plenty of diversity is assured through the different add-ons with various functions such as chronograph, power-reserve display or second time zone. There's essentially no need to improve this movement. Of course, at a certain price level, a customer has a right to expect a wristwatch to contain a base movement made by the watch's brand. The power reserve could be lengthened to last more than 46 hours. As a base movement, the ETA 2892 has its limitations: practically only modular add-ons are possible, and the stability, size and torque all have their limits. That's why for the new world-time module in Eterna's Porsche Design Worldtimer, we had to rely on an ETA-Valgranges movement because the module wouldn't have fit on an ETA 2892."
— Patrick Kury, Technical Director, Eterna

Eterna Diver

models supporting a wide array of additional functions.

The ETA 2892 also serves as a base for more exacting demands — at least until 2010, when ETA, with permission from the Swiss legal authorities, will terminate sales of movement kits. Until then, specialized enhancers such as Dubois Dépraz, La Joux-Perret and Soprod will continue to offer everything one's heart could possibly desire: engravings, rotors crafted from precious metals, PVD coatings, etc. The modules include chronographs, power-reserve displays, and a repeater movement with chimes. The trusty 2892A2 served as the base for Omega's Caliber 2500, introduced in 1999, the first to incorporate George Daniels's co-axial escapement. All that's missing is a tourbillon. Then again, a watch with a tourbillon wouldn't run any more accurately than the officially certified chronometer version of the ETA 2892A2. ○