CHRONOMAT by Breitling

INSIDE THE CHRONOGRAPH

Here is a riddle for you – What do people use to cook their egg in the morning? What is an integral part of their run after work? What is necessary for determining the winner of many sporting events? The humble chronograph.

›Keith W. Strandberg

Chronographs are one of the most popular complications in watchmaking and are used in timepieces for both men and women. There is something about the chronograph that captures people's imagination and, as such, this complication is certainly in high demand.

Kinds of chronographs

Standard chronograph: This watch has two or three sub dials (also known as totalizers), and the standard two pusher layout (the top pusher starts and stops the timing, while the bottom pusher returns the timing hand to zero).

Monopusher: this chronograph only has one pusher, which is sometimes integrated into the crown and in other cases is by itself. This pusher starts, stops and resets the timing mechanism.

Flyback: A flyback chronograph allows the user to restart the timing hand at anytime during the timing process. One of the most useful chronograph complications, but not one of the easiest to make.

Split second: A split second chronograph has two timing hands, allowing the user to 'split' these hands, effectively timing two things at once.

Complications: One popular thing for watch brands to do is to include the chronograph in complicated watches. For example, there are tourbillon chronographs, perpetual calendar chronographs and also grand complications with chronographs.

Quartz: Quartz chronographs are very popular indeed. Extremely precise, quartz chronographs often use the sub dial layout that has been popularized by mechanical watches, but they also use digital displays, which helps showcase the quartz chronograph's phenomenal accuracy.

Why is the chronograph so popular?

Using a chronograph is easy and fun, and very functional. "It's really an added function that is not just an additional display", says Jean-Paul Girardin, Vice President, Breitling, "It's something you can use to measure the time, not just to read the time. Due to this, you have an interaction with the watch. Interactivity makes things completely different, since you are doing something, not just reading something. You interact with your chronograph. By doing this, you cannot control the time, but you are heading in that direction." Girardin continues.

Chronographs are very popular because they offer a very accessible complication and one whose standard layout is very attractive. "Aesthetically, the chronograph is a well liked complication as it has a technical sportive style via the chronograph pushers on the case, the dial and the movement type," details Philip Barat, head of the watch development department at Patek Philippe. "The chronograph mechanism is visible via the sapphire case back and it has a very technical look."

1911 BTR PERPETUAL CALENDAR CHRONOGRAPH by Ebel
ANNUAL CALENDAR CHRONOGRAPH by Patek Philippe
TYPE-M MONOPUSHER by Gerge

Also, the cost of entry into the mechanical chronograph world is not as steep as other complications, like perpetual calendars, tourbillons or minute repeaters. "The chronograph is the first complication people can afford," states Jean-Frederic Dufour, President, Zenith. "The chronograph brings you emotion – it means something to you. The functionality is very nice, it speaks to a large amount of people. It's an easy complication to understand."

Also, chronographs are linked to competition, sports and moving, mechanical parts. "Chronographs became boy's toys, because their look is sporty and the origin is from competition," says Thomas Morf, President, Morf Consulting. "As we all know by now, men like to compete and therefore the chronograph underlines a certain masculinity."

People like to pass time in an attempt to control it. Since the very beginning of timekeeping, we have been qualifying events and performances, like Usain Bolt's gold medal-winning sprint and how long it takes your kids to run around your house!

"It is reasonable to think that, for a very long time, man has needed to measure time: to set markers and define durations," explains Jean-Christophe Babin, President of TAG Heuer. "Progress has given us a more definite idea of time. People now require much greater precision so they can measure fractions of time. As the purpose of a watch is to tell the time, the chronograph is, naturally, the most popular option, because it divides the time as precisely as possible. The chronograph has also become much more important with the development of sport."

The challenge of the chronograph

It's not easy to make a reliable, industrially-produced mechanical chronograph. In fact, it may be one of the hardest things in watchmaking, which accounts for the lack of options when it comes to mass produced chronograph movements. "Technically, a traditional column wheel chronograph is more difficult to make than the shuttle chronograph mechanism," says Patek's Barat. "The difficult part is the development and setting of the chronograph functions and innovations."

NEW PATHFINDER by Casio
AQUARACER 500 by TAG Heuer
EL PRIMERO STRIKING 10TH by Zenith

Getting it all planned, with an eye for expansion in the future is one of the hardest parts. "Chronograph movements are indeed not easy to develop and produce," says Thomas Morf. "There are a couple of things which need to be considered when you develop a chronograph. Reliability comes with clever engineering, mastering processes and industrialization; it can't be 'thrown together'. And all this is not free of charge. The journey is tough, but very rewarding when you get there."

Breitling, as an example, spent a great deal of time determining the parameters of its new BR01 chronograph before actually beginning production. "The key consideration is to make a clear product specification," says Breitling's Girardin. "What do you want? Do you want a mass production chronograph, or do you want something high performance, or do you want something exclusive? Then, it makes your life much easier when you have defined what you really want, setting up the level of complexity of the product.

"If you want a high performance Ferrari or a very reliable Volkswagen, both are very difficult," he continues. "For us, quality is meeting the technical specifications we set. For us, we didn't want to do a mass production product, but we also didn't want to do just 100 pieces a year. We are still in industrial production, but we wanted a high performance product that we could produce in about 50,000 pieces a year. Of course, our cost targets were also quite important, but on the other hand we didn't want to lower the performance characteristics as well, as each movement had to be COSC certified."

Zenith is responsible for one of the stars of chronographs, the El Primero. "It's very hard because you need to have a mechanism that can start, stop and reset in an accurate way," says the brand's Dufour. "When you press on the pushers, even after a thousand times, they still have to work with the same accuracy. It's also 300 plus parts that all have to work together. Precision is part of the DNA of the brand. When Zenith started, the only way to succeed was to stand out and we chose to stand out by precision."

Several brands have recently introduced new chronographs and still others are working on them. Why, when there are tried and true movements on the market?

"Because it's the challenge behind it," says

ADMIRAL'S CUP BLACK SPLIT-SECONDS by Corum

Thomas Morf. "Every serious watch brand should have its own chronograph movement. With that, you separate yourself from the wannabes. You play in a different league and it generates a lot of credibility for a brand - and when you make money out of it, all the better."

New ways of displaying elapsed time

Lately, many companies have redesigned how elapsed time is displayed, foregoing the totalizers/subdials and using alternative ways – linear, retrograde, turning discs, using the hour and minute hands to display and more – and we can expect to see more of the same as these alternate ways have gained acceptance on the market.

"For us, new things are always interesting," says Breitling's Girardin. "In 1934, Breitling defined the classic three totalizer dial structure, so we are keen to keep doing it. Some years ago, we had the two totalizers in one sub dial, so you could read the time you are measuring like a watch. If you want something very precise, we prefer to offer quartz or electronic chronographs."

There is definitely room in the market for both classic and modern, and sometimes in the same collection. "I personally like the classic way, but with the new ways of displaying elapsed time, a brand can distinguish itself from others," says Thomas Morf. "I think this is more important to brands, than having a true benefit to the customer. Easy-to-read is still one of the most important factors, when it comes to a chronograph."

The future of the chronograph

Chronographs are here to stay, with just about every company offering up their version of this time-honoured complication. It's a combination of sportiness, dial design and functionality that attract people, so companies will continue to meet the market's demand for chronographs.

"TAG Heuer continues to push the boundaries of precision timekeeping in the mechanical and digital fields, despite the exponential constraints," TAG's Babin says. "But it is no secret that our primary objective is to achieve industrial perfection with the mechanical timepiece accurate to 1/100th of a second."

"Chronographs are not a trend anymore," states Breitling's Girardin. "In the 80s, chronographs were almost dead, then the Chronomat started mechanical chronographs again. The future of the mechanical chronograph is progressing quite well."

The chronograph has been around for quite a long time, having its roots in sport timekeeping. Today, it is still one of the most popular, and affordable, complications in watchmaking. As companies refine and introduce their own in-house chronographs and designers come up with new and interesting ways of reading elapsed time, the chronograph is sure to stay extremely popular and wonderfully useful. ❮

TO RUN OR NOT TO RUN?

Many people buy chronographs for their look rather than their performance. In fact, I have asked people who are wearing chronographs if they ever use them, and the answers are often "no", and in fact some people don't even know how to use them.

However, one of the common questions I get is if it's OK to keep a chronograph running all the time. Many people like to have a moving second hand and use the chronograph hand in this function.

The consensus from the people I have talked to for this story is that there is no consensus. Some worry about the debilitating effect on the movement, while others think running the chronograph continuously will not affect the performance of the watch. Some, in fact, believe running the chronograph is preferred to never running the chronograph.

"The BR-01 movement has been designed and tested both ways, so for us it doesn't matter," explains Jean-Paul Girardin, Vice President, Breitling. "With the level of amplitude we have and the power reserve, it doesn't change so much regarding the timekeeper. If someone wants to wear his watch with the chronograph running all the time, it won't hurt it."

Thomas Morf believes that since the chronograph is about performance, it makes sense that the chronograph performs in order to stay in working order. "Since a chronograph is rarely used for what it was built for, people use it to play with it. It's like an engine of a car - you should sometimes use the car in order to keep the engine smooth. It's the same thing for a chronograph - use the chronograph function in order to keep it working perfectly."

Babin from TAG Heuer uses the car example as well, this time to recommend not running the chronograph all the time. "It's not a good idea to leave your car running when it's not in use," he says. "The same is true for watches. If the wearer wants to keep their chronograph running permanently, they can, but we wouldn't recommend it. It is best to use the chronograph when you need it."

Philip Barat head of the watch development department at Patek Philippe, says that it depends on the type of chronograph mechanism. "For example, on the Patek Philippe self-winding CH 28-520 with vertical clutch, the chronograph hand can be kept running without any influence on the movement precision, whereas on a horizontal clutch system it has an influence on the movement precision and creates more wear."