

# REVOLUTION

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## The Greatest Watch You've Never Heard Of: Longines Nonius

LONGINES

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*The Longines Nonius was a valiant attempt in the late 1960s to crack the elusive puzzle of making the chronograph ever-more accurate.*

Horology is not your normal competitive activity. The cancellation of the Swiss chronometer trials at the end of the 1960s put paid to the “Olympics of accuracy” and a recent attempt to revive them in the Concours de Chronométrie has been hampered by the severely limited field of entrants. Certified accuracy may be out of fashion, but healthy competition in other areas seems to come in waves. Right now, it is thinness where the records are falling, but a few short years ago it was chronograph frequency that came under the spotlight with ever increasing claims for accuracy.

The frequency of a movement indicates how finely the escapement slices up time to be displayed by the chronograph seconds hand. A Speedmaster with a 321 caliber beats away at a relatively sedate 2.5 Hz, meaning each beat is 0.2 of a second. Early 7750 calibers ran at 3 Hz with each beat a rather awkward 0.167 of a second. Later 7750s and the Rolex Daytona's caliber 4130 jog along at a lively 4 Hz, allowing a display of 0.125 of a second.

In 2010, Breguet launched their reference 3880 a chronograph with a 10 Hz escapement allowing a display of 0.05 of a second. In 2011 TAG Heuer blew the competition away with their Mikrotimer, running at an incredible 500 Hz and capable of showing 0.001 of a second. Not content with this, the following year they doubled the frequency to 1000 Hz with their Mikrogirder, displaying 0.0005 of a second – a record that stands to this day.



The Nonius came with an additional gauge attached to the tip of the chronograph seconds hand to enable greater precision reading

Back in the late 1960s Longines came up with a distinctly odd take on chronograph accuracy. Named the Nonius, the watch had an additional gauge attached to the tip of the chronograph seconds hand to enable greater precision in reading a timing result. Just to confuse things, a “nonius” is a term used in English until the end of the 18th century to describe a Vernier scale. French mathematician Pierre Vernier invented his scale in 1631 while Pedro Nunes (Nonius in Latin) developed a somewhat different predecessor 90 years earlier.

The Vernier scale is a way to take a more accurate reading of a point between two marks on a scale. The mathematics is complex but the use is simple; the fraction between the two marks, where the tip of the chronograph hand has come to rest, is found by looking along the mobile scale for the best alignment of a mobile mark with one on the dial. This then gives the tenths of a second reading. The mobile scale is short by one tenth per increment compared to the dial scale. For each tenth of a second the second hand is beyond a dial seconds marker, the corresponding number along the mobile scale will be shifted into perfect alignment. The human eye is incredibly good at judging alignment compared to distance travelled across a small gap and in this way the Vernier gauge acts as a magnifying glass for the hard-to-read seconds track of the dial.



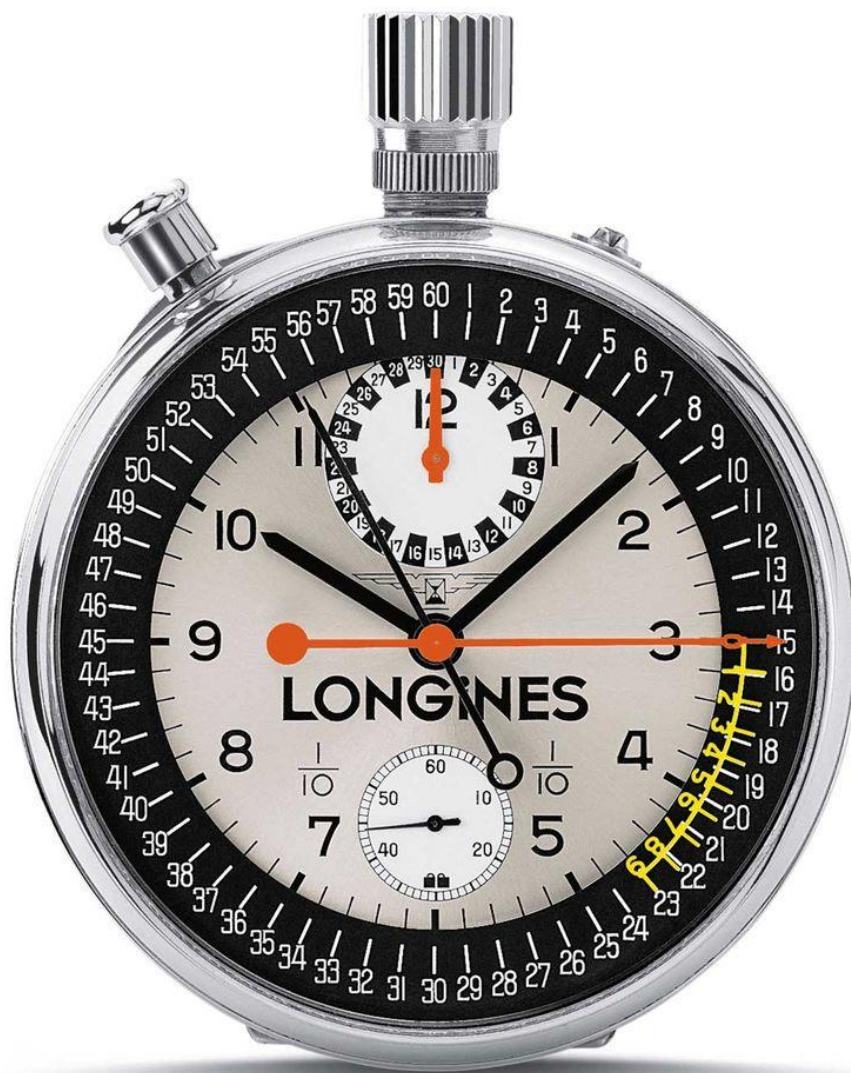
Longines Nonius Cushion Shaped Chronograph Ref. 8271

Longines first produced this quirky wrist chronograph in 1968 using a stripped back variant of their Calibre 30CH which had its running seconds sub-dial removed to become the Cal. 538 (not to be confused with the much later quartz calibre 538.). They continued to use this strange seconds hand until 1972, by which time the movement had changed to a twin register Cal. 332, a rebadged Valjoux 726. That the watch lasted for four years in production is quite an achievement for a design that is clearly just a gimmick.

Why a gimmick? The answer lies in the escapements of the two movements. The Longines calibre 30CH ran at 2.5 Hz – giving five beats

per second and so five positions that the seconds hand could land in. Having a resolution of 0.1 seconds is therefore useless until the advent of 5 Hz wrist chronographs such as the Zenith El Primero. Even worse was the upgrade to the Cal. 332, this was running at 3 Hz, giving six beats per second. With a Vernier scale set up to read tenths of a second, the only alignment possible would be at the 0.5 seconds point, all the rest would fail to line up at all.

The outlandish design had one further flaw, the weight of the Vernier scale itself. Positioned at the tip of the seconds hand, this extra weight created large amounts of additional torque as the chronograph was reset. This meant that the hand was prone to working loose or falling off altogether.



The Calibre 262 had a frequency of 5 Hz, making 10th-of-a-second timing possible...

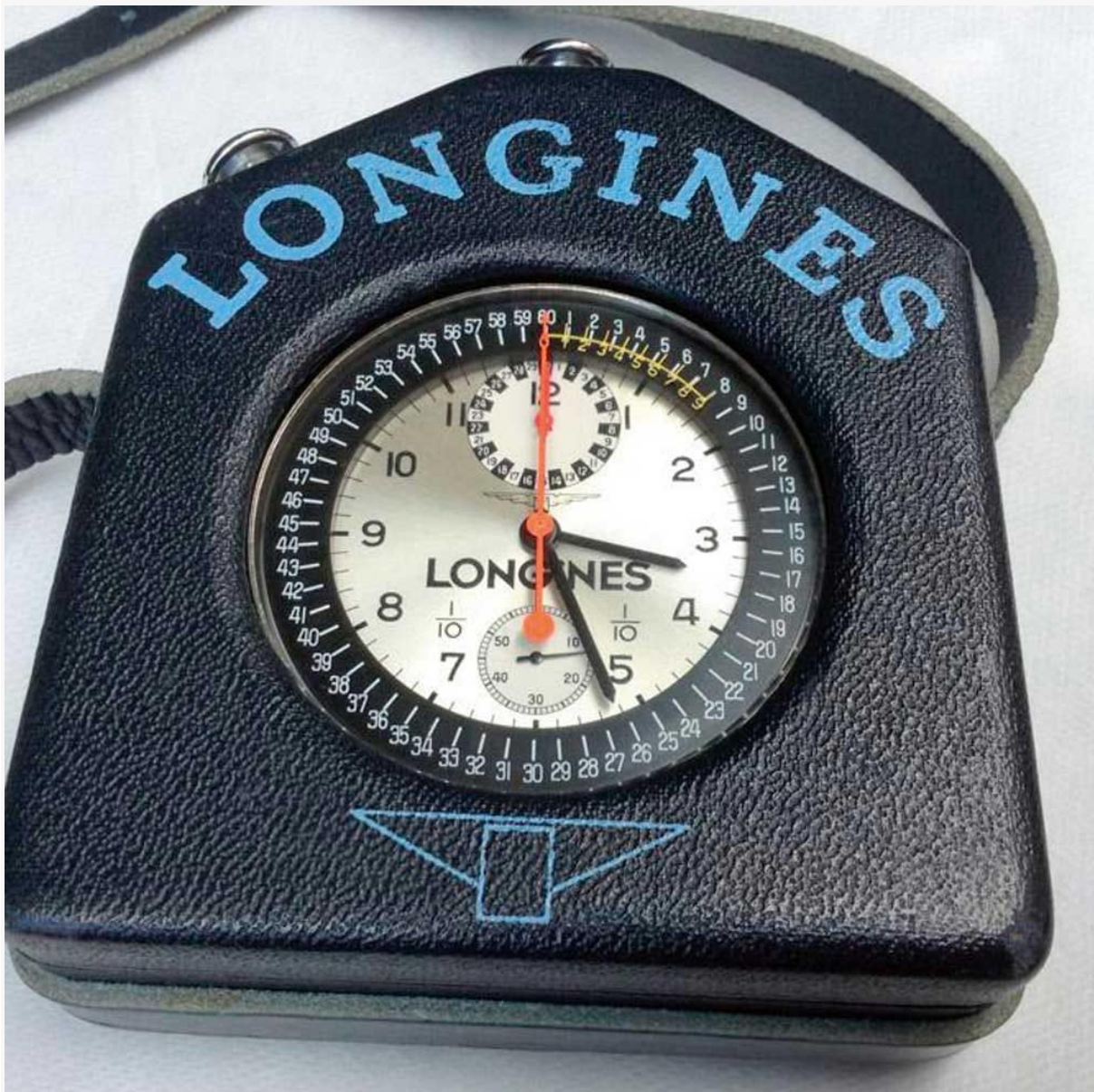




...and at the 1968 Mexico Olympics in 1968 Longines shared timing honours with Omega. Rather than a gimmick, maybe we should view the Longines Nonius as an homage, or, indeed, Olympic memorabilia. The Vernier gauge was first seen on a watch far better equipped to use it to the full. Based on a 5 Hz competition-grade chronometer movement, Longines had originally planned to use this system for Olympic timing chronographs for the, sadly cancelled, Helsinki Games of 1940. The Mexico Olympics in 1968 saw Longines share timing honours with Omega and finally their plans came to fruition. The calibre 262 split chronograph was revealed in 1966. With a frequency of 5 Hz, 10th-of-a-second timing was possible, necessitating 600 hash marks on the outer track. Accurately reading crucial results would have been impossible without the magnifying



effect of the Vernier gauge, leaving the only source of inaccuracy as the speed of the marshal's thumb.



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