



Accuracy in a mesmerising three dimensions: Franck Muller's Revolution 3 triple-axis tourbillon wristwatch.

Whirlwind

Sweeping the industry with relentless pace, the tourbillon craze shows few signs of abating

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Despite the fact that Abraham-Louis Breguet's invention has been with us for over 200 years, it is only recently that the tourbillon has become a must-have for both makers and collectors – who are now confronted with a myriad of flying, half-flying, double- and even triple-axis varieties, with price tags ranging from the merely astronomical to the cataclysmically expensive. QP runs the rule over the field.

Given the mystique invested in the tourbillon by all but the most jaded of watch collectors, it is worth briefly recounting just what separates them from common watches. As the gain in accuracy that originally led to the tourbillon's invention has been more than compensated for with modern materials and techniques, the reason must lie elsewhere. The truth lies in two related characteristics of tourbillons: they are complicated to make (in terms of assembly) and consequently difficult to finish (both in terms of aesthetics and regulation). The result is that they have been, until now, produced in tiny numbers – currently no more than a few

thousand per year. The appeal of these watches lies in exactly this combination of exclusivity and excellence.

Technicalities

It is perhaps a surprise to note that a tourbillon wristwatch is more or less 90% identical to a regular wristwatch. It too requires a winding barrel, going train and all the rest. It is simply the escapement that differs – it rotates within a cage, or 'carriage', successively assuming every vertical position, usually every 60 seconds. This negates any rate errors induced by gravitational pull on the balance spring when held in a single orientation.



The movement for Greubel Forsey's double-axis 'Double Tourbillon 30°' (SFr.380,000) – named after the space-saving 30° angle between the normal 60-second carriage and the larger 4-minute carriage, within which the former revolves. The 128 components of the tourbillon weigh a mere 1.17 g.

(Below) An exploded diagram of Richard Habring's bespoke tourbillon mechanism.

Quite simply, it is the tourbillon escapement itself – most often visible from the dial-side of the watch – from which close scrutiny will reveal the quality and artistic merit of the particular piece being offered.

The regular single-axis tourbillon has a bridge placed above the tourbillon cage. This easily visible area is the key area to examine and consider for shape, polish and finish of both the bridge and cage. Traditionally, the bridge angle was simply 180° about the centre axis; today, many different angles are used, sometimes appearing wing-shaped, built of two arcs, cut out, wave-shaped, the list goes on. It has, in short, become an expressive element of the tourbillon wristwatch's character. The only rule is that the bridge should not in any way clutter the view of the tourbillon cage (otherwise, why show it at all? You may as well just cover it with the dial, as Breguet and his contemporaries did – they had little urge to allow clients a peek under the hood, so to speak).

All in the finish

When you examine the upper tourbillon bridge under a loupe, myriad angles and surfaces will quickly divulge the cleanliness of workmanship and definition of line. Expect a highly priced model to be exemplary, with a high mirror-like finish on all these microscopic areas, including the screws (including

their grooves and edges) at each end. Standards less than perfect are really not acceptable at this level.

The tourbillon carriage should also achieve these standards, although it is even more difficult to finish. Its complex shape makes perfection a tricky and delicate achievement. (In earlier times, the shape of the upper part of the carriage was equivalent to the signature of the watchmaker. For those who are interested, a look into Reinhard Meis' wonderful book *Das Tourbillon* reveals charts of these independent shapes in several beautiful drawings.)

The 'economical' alternative

Like any fine piece of workmanship, quality of finish and price are directly proportional. The 13.75 tourbillon calibre made by Swiss Time Technology (STT) is available at several levels of finish and detailing, and can be customised to a watch manufacturer's order. Many brands utilise it already, and the group is growing yearly. Even Harry Winston Rare Timepieces is flirting with its charms.

The new design is largely the brainchild of the same Elmar Mock responsible for the major patents behind the Swatch. This means it enjoys the possibilities offered by the most advanced production machines in existence, with the majority of its parts manufac-

tured with minimal requirements for hand finishing. It is consequently less expensive to produce and a highly stable, robust timekeeper to boot. You will find it in watches as diverse in style as Technomarine, Frédérique Constant, Alain Silberstein, Antoine Prezioso, Chronoswiss and Ikepod.

The maverick alternative

Within a small and discreet world of collectors, the name Richard Habring has been known since 1989. He is another of those exceptionally talented people who began his career working for larger companies, later starting up his own small in Austria. He earned his 'tourbillon spurs' during a long and fruitful relationship with IWC and A Lange & Söhne. His maverick status arose from the ability to take a regular calibre, remove the escapement and install a tourbillon escapement in its place. This was actually one of his first jobs: Gunther Blümlein approached him at the last possible moment and asked him to turn the nearly completed 'Il Destriero' IWC calibre into a tourbillon, after all the gearing and basics were already in place; a quite amazing feat. Several collectors have subsequently sent Habring their IWC wristwatches, as well as those of other brands to be customised into one-off tourbillons; the ultimate in exclusivity, plus an economical alternative. Such magic can even be performed with rather mundane calibres such as the ETA 6498-2. He will be introducing his own tourbillon line, with this particular calibre as a basis, in 2005.

Double the trouble

Breguet's marvellous invention was originally intended for the pocket watch, whose balance spring was mostly in the vertical plane. With a tourbillon watch placed dial up or dial down however, the effects of gravity can have full reign on timekeeping properties. It was not until the second half of the 20th century that this issue was addressed, with the invention of the double-axis tourbillon. Even then, it took a number of years before these concepts could be miniaturised to the scale of the wristwatch. As usual, the Swiss elves did their work and in 2003 we had double-axis releases from Franck Muller (the Revolution 2 wristwatch) and the small independent watchmaker Thomas Prescher, with his pocket watch. (Richard Habring had already presented the first European double-axis table clock in 1996.)

In both versions, an additional axis is added, rotating the whole carriage in a plane perpendicular to that of the dial. One could say,



without exaggeration, that this represents the culmination and perfection of Breguet's original ideas regarding the tourbillon.

The various double-axis varieties now on offer perhaps show most clearly that there are several ways to skin a cat; each of the brands choosing different routes to achieve their results. Gruebel Forsey has avoided rotating the tourbillon in the direction of the dial and back; its ingenious solution involves an inclined tourbillon rotating within another axis. This saves height and the motion of

Patek Philippe's ref. 5101P grand complication, with 10-day power reserve and tourbillon; a rare example of a contemporary model with its tourbillon carriage occluded by the dial (£152,000).



(Left) Technomarine's Spiderman tourbillon, of which just six were made (\$80,000), selling out within 48 hours at BASELWORLD 2004. A quirky aspect of the STT calibre (used here) is that it is of the 'flying' variety – a rather rare construction, where support is provided not from two opposing sides as in the standard single-axis version, but from one side, allowing a more spacious view of the spinning escapement.

(Right) Girard-Perregaux's Vintage 1945 Tourbillon with the manufacture's signature Three Gold Bridges from which the winding barrel, going train and tourbillon pivot respectively (£85,250).

the tourbillon never reaches a flat plane under virtually any degree of position. The Jaeger-LeCoultre Gyrotourbillon 1 has also chosen an incline for similar reasons, but both axes are placed at 90° to each other, necessitating a rather small balance wheel – a less positive point for timekeeping purposes. In yet another approach, Prescher has utilised a flying tourbillon construction to leave as much space and the clearest view of the tourbillon available in the entire market.

Stratospheric

Whereas the double-axis tourbillon was clearly a logical progression that started with Breguet, the triple-axis tourbillon really is just horological sculpture; begging to be made for a similar reason to that cited by mountaineers: "because it's there". In this version, a third axis is added, turning in the same plane as the dial and 'carrying' the other two axes like the Earth and its moon around the sun.

Timekeeping-wise, there is no advantage gained. They are simply fantastic to watch. One can spend hours trying to decipher the inner workings.

At the moment, there are only two companies producing them: Franck Muller and Thomas Prescher. Both pieces are technical marvels, but the piece by Thomas Prescher with its open, flying tourbillon construction has made waves among all lovers of horology. The spaciousness is such that the escapement seems to float in the air without any obvious connection to the rest of the watch.

In any case, the tripe-axis torubillon will definitely be in the respective spotlights of Basel and Geneva next year; your reporter has already witnessed two prototypes of tripe-axis models from different companies that should be appearing in 2005. It is clear we have not quite reached the end of the tourbillon line just yet. ○