

Horology

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The term 'Horology' is defined as the art of measuring time and the manufacture or making of clocks and watches.

In this article I discuss the manufacturers of automatic wrist watch movements and I have included images of automatic self-winding wrist watches which I have purchased to add to my collection.

My Smart Watch

I have been wearing a smart watch which is connected to my smartphone. The watch is great for receiving text, email messages and phone calls which I can answer using the watch.

I purchased my first smartphone in January 2021 and I purchased a smart watch to accompany it. Over my 75 years plus, I had collected a number of watches, quartz, manual and automatic but they had been put aside. It is often mentioned on the internet that smart watches such as those from Apple and Garmin, amongst many others, are destroying the businesses of established watch bands due to their popularity. Of course, the younger generation have embraced smart watches and to be fair these types of watches reside in a new digital era and where gadgets are not permanent possessions and are usually abandoned when their batteries fail or a newer model comes along.



My smart watch (image above) sits on my wrist in sleep mode to save the battery power, but it does not catch my eye, there is no visible appreciation, no interaction, until it is awakened by my smartphone in my pocket. Of course, it is connected to a fitness app on my phone which can monitor my heart beat, oxygen/blood levels, stress levels during everyday life and when I exercise. I can understand why fitness fanatics use them but I never made use of the app and became bored checking my heart beat.

Mechanical Watches - Interaction & Appreciation

Some years back, I had returned to a more relaxing retro style of life, a life I enjoyed in the 1970s: playing classical vinyl LPs on my record deck, using my 35mm film camera for my photography, writing, cycling, motorbiking, hill walking and interacting with the wildlife around my home. So, it was a natural progression to put aside my smart watch and wear my mechanical watches, which to be honest, deliver more pleasure.

I started researching watch brands on the internet. I concentrated on manual wind and automatic self-winding variants, which to me offered the 'Epitome of Art' in my appreciation of their mechanical movements and cases.

I dug out all my watches and replaced the batteries in the quartz movements and had the automatic self-winding and manual wind movements serviced. I even had my late father's automatic watch repaired and serviced.



I also added to the collection and my first watch which I purchased was the Seiko 'Alpinist' with a green dial face as shown. It is an automatic watch with a mechanical compass and is waterproof to a depth of 200 metres. It sports a Seiko 6R35 3hz automatic movement.

Third Party Mechanical Movements

Many watch brands do not manufacture their own in-house movements and instead, purchase Swiss or Japanese movements to insert inside their own watch cases; very often the movement is embellished with their own brand name, code and finishing. The main market leaders for third party movements and spares/repairs are ETA, Miyota and Sellita.

ETA SA Swiss Watch Manufacturer

ETA designs and manufactures quartz battery powered movements, including hand-wound and automatic self-winding mechanical movements. **ETA**, the company is headquartered in Grenchen, Switzerland, and is a wholly owned subsidiary of The Swatch Group. Though ETA was founded by Eterna in 1856, some part of its production line can be traced back to the 1793 founding of Fabriques d'Horlogerie de Fontainemelon (FHF) by David Benguerel, Isaac Benguerel, François Humbert-Droz and Julien Humbert-Droz. Through a series of mergers, ETA has become the largest manufacturer of Swiss watch movements and controls a virtual monopoly over their production and supply. ETA has undergone several Swiss government investigations due to its market position. To resolve the concerns of Swiss government regulators, ETA has entered into an agreement that governs certain business practices.

Miyota Japanese Watch Manufacturer

Miyota is a brand of mechanical and quartz watch movements manufactured by the Citizen Watch Manufacturing Co Ltd. In 1959 Miyota Precision Co., Ltd. was established in the town of Miyota, Nagano Prefecture, Japan as an assembly factory for wristwatches. The company was renamed Miyota Co Ltd in 1991 and Citizen Miyota Co Ltd in 2005. In 2008, the company was merged with Citizen Finetech Co Ltd to form Citizen Finetech Miyota Co Ltd. In 2015, it merged with Citizen Seimitsu Co Ltd to form Citizen Finedevice Co Ltd. The company produces watch parts such as crystal oscillators and bearing jewels, but its watch movement manufacturing business has been transferred to Citizen Watch Manufacturing Co Ltd.

Sellita Swiss Watch Manufacturer

Sellita is a Swiss manufacturer of mechanical watch movements based in La Chaux-de-Fonds in the canton of Neuchâtel. Founded in 1950, Sellita was one of ETA's major outsourced assembly partners for their movements

until 2003. After 2003, Sellita developed its own movements based on ETA movements with expired patent rights and has become one of the main movement manufacturers of the Swiss watchmaking industry.

Seiko – Rolex - Citizen

Seiko (Japanese), Citizen (Japanese) and Rolex (Swiss) are the only three watch companies considered to be vertically integrated, which means the company has the technology and design development, to manufacture all of the parts in-house, assemble, adjust, inspect and ship them in-house with full backup warranty, servicing and repair, either through their dealerships or return to factory. Of course, many other brands assemble third party parts along with their own in-house manufactured parts and offer similar warranty and aftersales service.

3Hz and 4Hz Movements

When you begin to research ETA, Miyota and Sellita, and other watch brands, it soon becomes clear that there are many similarities in the movements. In the cheaper price range of watches, most ETA, Miyota and Sellita



movements run at 3hz, 21,600 vibrations at 6 beats per second. In the higher watch price range, the movements tend to run at 4hz, 28,800 vibrations at 8 beats per second and offering better accuracy in time keeping. If you do your research, 4hz movements exist in some sub £1k priced watches.

Other brands, such as Rolex, Seiko, Breitling, Nomos and Omega, amongst many others, also offer 3hz and 4hz movements in their own in-house manufactured watch movements. Grand Seiko even offer rare 5hz movements.

I added a second automatic watch to my collection which is an Oris Big Crown Pilot with a deep blue dial face and a textile blue strap (image above). It sports an Oris Calibre 751 automatic movement which is a Sellita Swiss SW220-1 movement based on a Swiss ETA 2836-2 4hz movement. It is certified for 100 metres water resistance.

Mechanical Movement Branding Numbers & Revisions

Invariably, the manufactured number of a movement is stamped on the main plate but is often concealed within a solid case back, making it impossible to see. Often, the watch literature deliberately leaves out key stats on the movement and even lists the movement as their own with a different code. Invariably, and on such occasions, a bit of research will reveal the true identity of the movement which may well turn out to be supplied by a third party, such as ETA, Miyota or Sellita. Like all other mechanical devices, a watch movement can be upgraded due to a fault in a part or parts which only come to light after a period of time. On such occasions, the code on the movement might display a revision number.

For example, the original might be listed as 800 but after a few faults it has been upgraded and the number might show 800.1 or even 800.3 showing 3 revisions from the original. The watch in a dealer's showroom might be 800 on the movement and if it has a glass back you will invariably be able to see the code. If the watch has a solid case back you cannot confirm it is old stock and if purchased, might later develop the known faults.

Movement Time Keeping – COSC & METAS Certifications

Are you a person who insists on accurate time keeping or can you live with resetting your watch's time, once a week? In watchmaking, the measure of time is not merely about functionality; it is a tribute to the watchmaker's meticulous craftsmanship and engineering brilliance. The precision of a watch is evaluated through various accuracy standards, which are benchmarks set by renowned institutions like the Swiss Official Chronometer Testing Institute (COSC). The Swiss Official Chronometer Testing Institute (**COSC**), established in the mid-20th century, became a pioneer in setting accuracy standards for wristwatches. COSC's testing protocols were rigorous and designed to simulate real-life wear conditions, including different temperatures, positions, and power reserve levels.

Watches that pass COSC tests receive chronometer certification, a mark of superior accuracy and reliability. COSC operates through a detailed and rigorous testing procedure that spans 15 days and involves multiple orientations and temperatures. A watch movement is tested in five positions and at three different temperatures (8°C, 23°C, and 38°C). The movement must meet strict criteria concerning its daily rate of accuracy, ranging from -4 to +6 seconds per day for mechanical watches. Only movements that pass these tests receive the coveted COSC certification, signifying them as "chronometers."

In the 21st century, the demands on timekeeping precision have only increased, leading to the development of the **METAS** certification. Recognizing the growing presence of magnetic fields due to electronic devices, METAS includes tests for anti-magnetism in its certification process. The METAS standards are comprehensive, testing not only for accuracy under various conditions but also for a watch's ability to resist magnetic fields, which can significantly affect a watch's functioning. The METAS certification process is more extensive than traditional chronometer testing, focusing not only on precision but also on resistance to magnetic fields, which are increasingly prevalent due to electronic devices. To be METAS certified, a watch must first pass COSC testing to qualify as a chronometer, after which it undergoes additional testing by METAS for magnetic resistance and accuracy when exposed to magnetic fields up to 15,000 gauss.

Regulating a Watch

When one evaluates watches that are not certified by COSC and METAS it becomes apparent that a watch's ability to keep good time becomes a bit of a lottery and in some cases, can vary from -20 to +40 seconds per day. These watches invariably come out of the factory unregulated, that is to say that a person does not sit at a desk and regulate the watch's mechanism.



Many watch collectors become obsessed with time keeping and when possible, to regulate a watch, they will remove the back and attempt to re-regulate it. Regulating a watch requires several tools. You'll need a case back opener, precision screwdrivers, a demagnetizer, and of course, a timegrapher. A timegrapher is a device that measures the accuracy of your watch and helps in fine-tuning its performance.

Some watches may not be COSC and METAS certified but are regulated in the factory to high time keeping standards. Of course, if you are prepared to fork out the dosh, you can have your non-regulated watch, which is keeping abysmal timekeeping, regulated by a watch dealership or watch repairer.

Watch Collectors

There are watch collectors who specialise in researching new watches for their collection. They are seeking those watches that will increase in value, such as Rolex which is in short supply at Rolex dealerships and sells second-hand, way above the retail price. There is money to make on a Rolex and other brands if you are prepared to wait months, even years on a dealer's waiting list.



Selling a new Rolex on (flipping) just after you have purchased it, can earn you some serious dosh. Of course, if Rolex upped their game and released more watches, 'flippers' would cease to exist. However, you don't have to purchase an expensive watch to appreciate it and excellent mechanical watches can be purchased at relatively low prices – some of which can match a Rolex for performance in the movement and case design.

My Watch Collection Storage

My final collection of watches (old and new) amounted to three quartz watches, one mechanical hand wound watch and six automatic self-winding watches. I opted to purchase from Amazon a SONGMICS Watch Box with 10 Slots, (above image) which is a watch box with a glass lid, removable watch pillows, a metal securing clasp and covered in black synthetic leather with a wine-red lining. There was enough room to take my largest watches, including my Seiko 'Alpinist' automatic which tends to sit much higher on its pillow due to its leather strap with fixed metal clasp.

Of course, the SONGMICS Watch Box comes in at £16.00 and it is not real leather but it serves my purpose very well. I popped one of those silica sachets that soak up condensation under one of the pillows which held a smaller watch; just in case there is ever any condensation in the box. If I wear one of my watches when out in the rain, I always place it in a warm place to dry off before it is placed in my watch box.

NOTE: The watch box image is from Amazon and is not my watch collection.

Mechanical Watch Service Maintenance

These days most mechanical watches come out of the factory oiled with synthetic oil which is far more durable and long lasting than the older mineral oils. Most brands recommend that their mechanical watches are serviced by a dealership or sent back to the factory every 3 to 5 years. Some brands, such as Oris are offering a 10-year warranty with servicing after 10 years. Of course, servicing a watch purchased new in the last few years, is often dictated by how often you wear it.

Some users purchase electronic watch winders that keep their automatic self-winding watch turning so as to keep it fully wound and ready for use. I prefer to let each of my automatic watch main springs run out (when not in use) and reset the watch date and time (as required) prior to wearing it. I **never** hand wind an automatic watch; I prefer to rotate it over a few times until the second hand starts to turn and then I put it on my wrist. My late father's automatic Bucherer lay in a drawer for 40 years with a cracked/holed glass and yet the other month, I picked it up, reset the time, rotated it a couple of times, put it on my wrist (wore it in the house for a day) and it worked. It was sent to Switzerland for a glass replacement and a service maintenance which cost £270.00.

The Art of Seduction

The art is visible in the case design, finish and presentation. It's the first thing you see when you examine a mechanical watch that catches your eye in the showroom. It is often the case, that a watch movement might prove to be junk but the heart usually wins due to the beauty of the case design and leaves your brain to deal with any future headaches due to faults developing.



I sought to add a third watch to my collection and on seeing the Longines 'Flagship' Heritage watch, I was immediately seduced but I did my homework prior to purchasing it. The 'Flagship' is a watch style from the 1950s and I like its minimalistic cream coloured dial face. It sports a Longines L615 automatic movement based on the Swiss ETA 2895-2 Elabore 4hz movement. It is a dress watch and certified to 30 metres water resistance. It is not suitable to wear when swimming or in a shower at home.

Watch brands are brilliant in the 'Art of Seduction' by using their cases to seduce you. However, with a little bit of internet research, sometimes a lot of internet research, you can make a short list and even a final choice of watch to suit your budget.

Whether it is a diver, chronograph, field, elegant or tactical watch, amongst other styles, the key areas to concentrate on are: -

- The history of the brand
- Do they manufacture their own movement or is it a third-party movement
- Do they offer full service and repair facilities directly or through their dealerships
- Is the movement a 1st generation with possible faults emerging or a 2nd or even a 3rd generation? The only way to tell is by the code stamp on the movement inside the watch. Sometimes you can see this on the movement if the back of the case is glass (as an example 800 or 800.2 or 800.3) Some brand manufacturers and/or their dealerships, when requested, will verify the revision number prior to purchase
- Is the movement 'time keeping' accurate (regulated or non-regulated) in relation to the price point
- Can a regulated watch, if found wanting, be re-regulated by the dealership whilst under warranty
- Can a non-regulated watch from the factory be regulated by a dealer or a watch repairer
- What is the warranty period and is there a warranty card in the box

My Watch Purchases

I purchased my three automatic watches from Chisholm Hunter at the Gyle in Edinburgh, Scotland. This UK company has been in business since 1857 and I received excellent assistance from Oliver, a senior salesman. He displayed great patience without any pressure and over several visits before I finally chose my watches.

I have a large wrist size at almost 8" so I found that the standard leather strap size of my new Longines 'Flagship' automatic watch was far too small when I tried it on in the shop; it was fitted with a larger matching strap at no extra cost.

Founded in 1857 on Chisholm Street, Chisholm Hunter first opened its doors in Victorian Glasgow. Originally known as the "Store of 10,000 Wonders", the shop stocked an eclectic array of rare treasures, including fine jewellery and precious gems sourced from all over the world. It quickly established a reputation for delighting even the most discerning customers with its wide variety of treasures and, as a result, enjoyed great success. Today, it includes a very fine selection of brand watches within its portfolio.