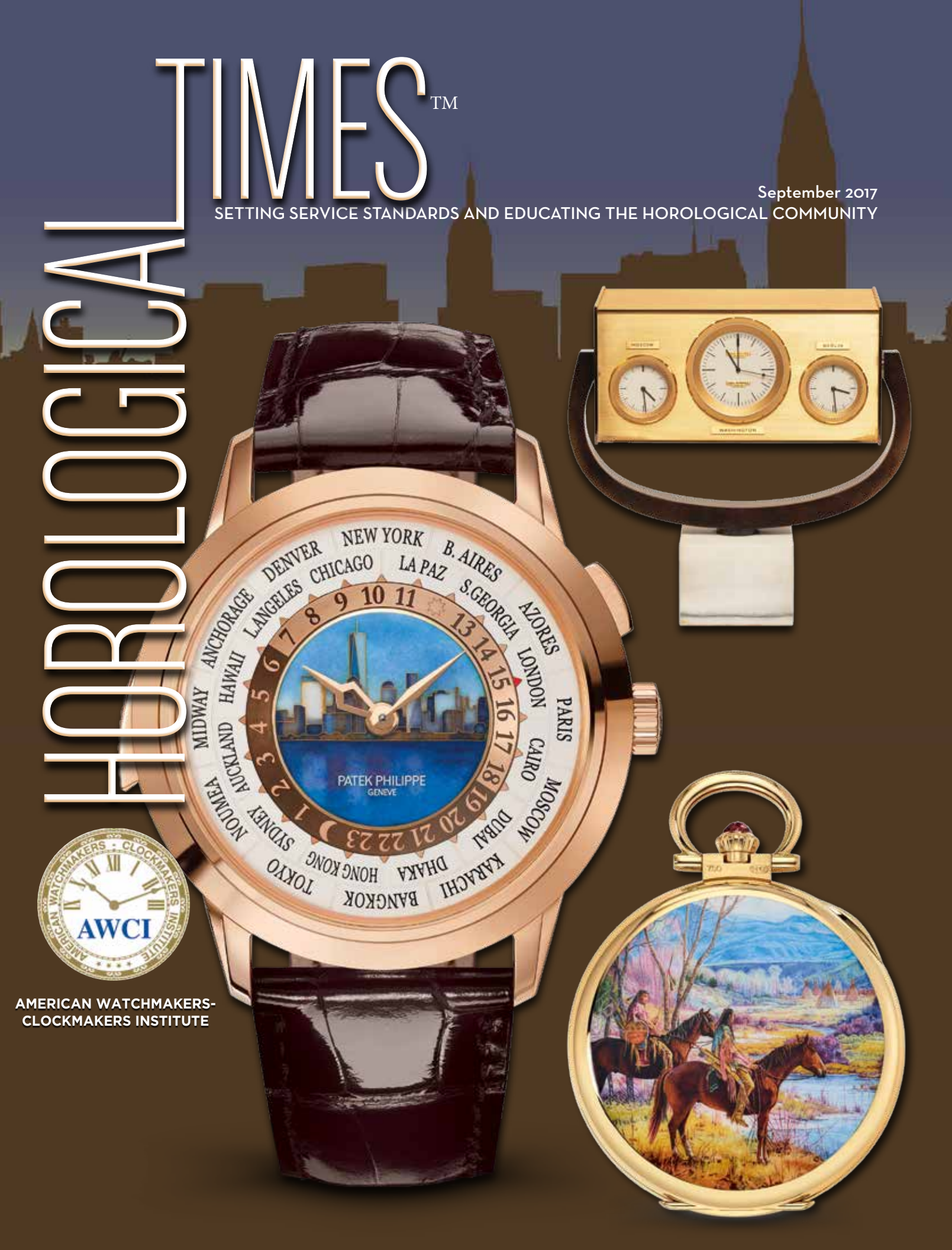
HOROLOGICAL TIMES™

September 2017

SETTING SERVICE STANDARDS AND EDUCATING THE HOROLOGICAL COMMUNITY



AMERICAN WATCHMAKERS-CLOCKMAKERS INSTITUTE

Witschi Waterproof Watch Testing





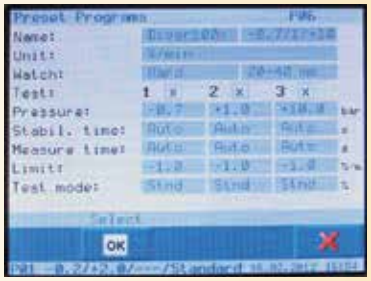
Witschi TS-PROOFMASTER-S

Pressurize from .2 to 10 BAR and vacuum to -0.7 BAR to detect small and large leaks. If leak is small, pressure will remain inside the watch to show air bubbles underwater.

- Seven preset programs
- Ten custom programs available
- Leak Finder program shows location of leak in watch
- Maximum watch size 70mm diameter x 28mm thick







Witschi TS-PROOFMASTER-M

Similar to the Proofmaster-S but with more functions. Adds fully automated dome opening and closing and a user-friendly, color touch-screen.

- Perform tests with a combination of up to three different pressure or vacuum values
- 9 preset programs
- 45 custom programs available
- Leak Finder program shows location of leak in watch
- Maximum watch size 70mm diameter x 28mm thick



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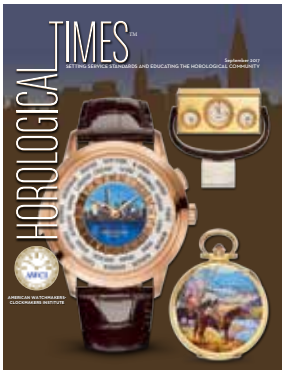
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Cover Image:

Timepieces from the Art of Watches Grand Exhibition in New York City in July. Clockwise: A clock from President Kennedy's library; a watch from the Special Editions Collection; a watch made specifically for this exhibition.

Photos courtesy of Patek Philippe

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OUR VISION:

AWCI's vision is to have an educated and passionate horological community practicing the highest standards and with the resources to provide quality goods and services.

OUR MISSION:

Setting service standards and educating the horological community.

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a message from the president

FRED T. WHITE, CMW21



Fred T. White
fwhite@awci.com

Over the last few years, I have tried to instill the desire to succeed by my messages. I hope that some of my thinking has inspired at least one of you to try to improve your lot in life. Most of us watchmakers have had to deal with the parts issue. Some years ago, I heard that if you are dealt lemons, then turn them into lemonade. There are certain problems that we cannot fix, but we can go down another road. So, you have a choice: If you can't get the parts, then do the "impossible:" It will take a little longer and you charge accordingly. You go searching for the part through our trade journals, and you may find a world of parts that you did not know existed. Recently, I needed a rare pallet fork for a rare Howard pocket watch. I had two choices: I could give the watch back to the customer, or I could go on a search. Because of my makeup, I don't give up, so I went searching. First, I called the material houses that I deal with, but no luck. However, I was not to be deterred. I turned to our trade journals and guess what? I found the part through the NAWCC mart. I called the gentleman and inquired if he might have this part, and it turned out that he did. We agreed on a price, I bought the part, and my customer is happy.

The "impossible" only takes a little longer and costs a little more.

In the words of Winston Churchill "Never, never, never give up." I have had the good fortune of knowing many World War II veterans, but none stand out in my mind more than my friend C.W. Smith. He was wounded in the Battle of Monte Cassino in 1944 while making an assault on the mountain. He lost a leg and lung, but he lived to age 82 and died with shrapnel still in his back. He had the most positive outlook in life of almost anyone I have ever known. Here was a man who could have given up but chose to go on despite his injuries, and he lived a good, long life, raised a family, and was a successful watchmaker. When you are confronted with a problem, I hope you will look back on these words and keep on working to find your solution.

We are preparing for a great convention in Tampa, Florida, October 4 through 8. It is an opportunity to meet with old friends and make new ones. There is nothing better than sitting down with your fellow craftsperson and building those relationships that may last a lifetime. They could be the very ones to help you overcome that issue you are having on any given day. There are also those classes that can expand your knowledge and give you handy tips that you may bring back to the bench and put to use right away. It was through attending conventions that I got to know Marvin Whitney, Joe Cerrullo, Jordan Ficklin, Henry Fried, and many more. Just think, if I hadn't attended those conventions, I would not have those great memories, and what a loss that would have been for me. I hope to see you in Tampa. Come—you will not regret it.

a message from the executive director

JORDAN P. FICKLIN, CW21



Jordan P. Ficklin
jordan@awci.com

¡Saludos mis queridos relojeros hispanohablantes! On my recent trip to New York City, I met some wonderful watchmakers at Central Watch in Grand Central Terminal, many of whom speak Spanish as their first language. They were a little surprised that I could speak Spanish, so I promised them I would give them a little shout-out in Spanish in the next issue of *Horological Times*.

Debido a que estos relojeros han comunicado un interés por tener clases en su idioma nativo, quiero saber a quién le gustaría aprender las clases de relojería en español. Porque hablo español, sería posible para mi enseñar clases de español como un esfuerzo colaborativo entre Tom Schomaker y yo. Si quieres clases de relojería en español por favor escríbenos.



We have been going full speed ahead on the convention here at headquarters. We are excited to be in Florida next month. It isn't too late to sign up. Yes, prices may have gone up, but it is still a good deal and definitely worth it!

I'm going to take a little extra space with my message this month because I had a tremendous time in New York, and I want to share it with all of you.

First, thank you, Patek Philippe, for the amazing exhibition you hosted in New York City. The Art of Watches Grand Exhibition was a once-in-a-lifetime experience, and I'm grateful for the effort and expense you put into promoting the horological crafts. I think we can all learn something from this exhibition; it was so much more than a sales tool. It generated real excitement for horology. As I stood in line waiting to go inside the beautiful Cipriani building on 42nd Street, the two gentlemen in front of me were discussing the great need for more watchmakers. After I apologized for eavesdropping, I then provided them with additional information about the state of the industry and a little encouragement to join this wonderful profession.

Inside, we had the dazzling experience of seeing all of Patek's current models in a Baselworld-like setting. Then, we had the amazing opportunity to witness some of their artisans at work. The exhibit featured limited-edition watches produced exclusively for the event alongside the very artisans who created them. Four different crafts were on display.

Continued on page 53.



Article Ideas

I just received my July issue of HT with the article by Bob Little on page 50, "Preparing a Clock Movement and Pictures to Educate Your Customers." It's a great "big picture" article, but I wonder if Bob could write a number of smaller, focused articles based on it. There are a few techniques that Bob used that I would love to hear more details about:

1. The rotary tumbler and stainless-steel pin media for cleaning/refinishing the parts
2. Morgan pivot polisher
3. Lacquering and heat-curing of plates/parts
4. Epi-Kote application

The first two items are unfamiliar to me, but I really like what I saw in the photos and would like to learn more. I suspect other readers would as well. The lacquering is of interest because it looks like Bob got a very good finish, and that's always a challenge.

I've never used Epi-Kote on clocks, so I'd like to learn more about Bob's experience and technique for application.

These may be only short articles, but I think there'd be a lot of interest among our members.*

Daniel Benson, CMW

Hi Dan,

Thanks for the positive feedback. Using Epi-Kote makes a big difference on keeping oil in place. (I got the Epi-Kote from Cas-Ker. But people can get their favorite brand of epilame from the supplier they use.) I think some people think it was developed for watches and that there is only one way to apply it. However, it is used in the mining industry, automotive industry, and other industries where it is critical to keep lubricant in bearings and places where the longest possible life is critical. It can be applied by spray, immersion, brushing, and stamping on with a felt pad. I just tried using it and hit upon a good method. I am sure some will criticize brushing it on, but it is one of the accepted industry methods.

Thanks again for the positive words!

Best regards,

~Bob Little, CC, CW

**Readers are encouraged to write to the editor if they would like to see an expansion of something they read in an article in HT. They may also offer their own explanations of how they do it.*

Auto Service and Watch Repair

During my high school and college years, I worked in an automobile gasoline/service station. We sold gasoline and provided after-sales service for automobiles. Parts were no problem in those days. Aftermarket parts came from an auto parts store. If factory original parts were needed, we bought them at a discounted price from the local dealership for the brand. This was customary for auto service of that era.

Around that time, I began my career as a watchmaker. There were many similarities to the business model of auto service. Independent watchmakers provided after-sales service for a multitude of brands. Many of the shops had the appearance of that pictured in the famous Norman Rockwell picture of a watchmaker working at his bench with a young boy looking at him. Spare parts were also not an issue for those watchmakers. Every major city, and many smaller ones as well, had at least one watch material dealer who sold aftermarket parts that were distributed by importers, most of whom are now history. If factory original parts were needed, many watch brands distributed them through the material dealers while others would sell directly to the watchmakers.

I have only recently stopped servicing my own cars and now bring them to the brand dealer for service. Because I had never been to a dealer for service in over 50 years, the transition that I saw was astounding. The service bays no longer look like the one shown in the accompanying photo I took in 1967, nor does the waiting room look as it did in the other photo taken that same day. In that era, automobile dealers looked upon spare parts and service as a low-profit adjunct to the sales of new and used cars. They had to provide both but they were of low priority. Since then, things have changed drastically. The auto repair shop waiting room of the 1960s was usually small, unclean, filled with cigarette smoke, and uncomfortable.


Service bay with crew.

Compare that time to the service department of an auto dealership today. They all boast of a spotless work area for the service and a clean comfortable waiting room, with food and beverage, wireless internet, and free rides to a shopping plaza for the customers. The automobile sales and service business model has drastically changed. Instead of service being a necessary evil to obtain an auto dealership, dealers now make more profit providing service than they do selling new cars.

While in Basel, I discussed this scenario with another watch company executive and he wholeheartedly agreed that watch manufacturing, distribution, sales, and service is becoming totally vertically integrated and the automobile dealership analogy was perfectly accurate. There is no reason for a financially strong watch manufacturer to only manufacture watches and sell them to distributors who could make a significant profit by merely buying and reselling the watches. For these companies, it makes more sense to manufacture the watch, own the regional distribution, sell them to "qualified" retailers or through their own chain of boutique stores, and then provide all of the after-sales service in their own facility. By following this business model, the watch companies are guaranteed a profit through every step of the process from manufacturing, distribution, sales, and service. Also, they are able to protect their brand image by ensuring a level of quality throughout the entire sequence from manufacture to consumer. The company executive assured me that this will be the new normal as companies now envision their futures.

Change is inevitable. There is no way to accurately forecast future business trends, but we can certainly observe the changes that have taken place in our lifetimes. Not all that long ago, every city, town, and even village had neighborhood pharmacies, mom-and-pop grocery stores, gasoline service stations, and yes, even a watchmaker or two. Almost every neighborhood pharmacy has disappeared to be replaced by a few nationwide drugstore chains. The mom-and-pop stores are now convenience stores, many of which have been converted from old gasoline service stations, and most of the watchmakers have passed on. Although the business models for those retailers and tradespeople have changed, these businesses still provide employment, but not as they did in the past. Pharmacists, auto mechanics, grocers, and watchmakers still have jobs, but now work for a large corporation rather than the old style of working in a small neighborhood business.


Waiting room with staff.

Epilogue

The two photos of the service station in the above article were taken in February 1967 with the latest Polaroid instant camera which would take photos in color and black and white. Our senior members will certainly remember Polaroid's revolutionary contributions to photography. Those high-tech cameras took photos and instantly printed them within one minute. Until that time, camera film had to be processed and printed at a specialty shop before the pictures could be seen. Polaroid was a high-flying company headquartered in Cambridge, Massachusetts. They employed thousands of people and had an enviable R&D department that employed scientists from the best universities in the country. Polaroid was one of the premier employers in the US, and anyone working there believed they had lifetime employment. Not too many years later digital imaging was developed and Polaroid struggled, failed, and finally disappeared.

I am telling this not to reminisce with the senior membership, but as an illustration of how quickly any industry can have a major upheaval that devastates both the companies and the people who earn their living in that industry. We know these changes happen. We just do not know when and which industry is next.

~Jack Kurdzionak, CW21, FAWCI

Cousins Material House

I am a Consultant working for Cousins supporting their legal action, and was the instigator and Project Manager of the Industry Action Fund that you refer to in your piece www.awci.com/news/industry-news-august-2017/ and in the printed *Horological Times*. I am

grateful for the coverage that you have given to this matter, but you have made a mistake in the piece that I would be obliged if you can urgently correct.

The Industry Action Fund was set up to raise money for research into the UK Watch Repair Industry that could be included in a report intended to be sent to the UK competition regulator. The money raised was only used for that purpose, and the project was able to achieve its aim far quicker than was anticipated when the Management Team met officials from the Department of Business, Innovation and Skills, and delivered an extensive dossier to them.

The research conducted by the Industry Action Fund has supported the case that Cousins is now fighting, but all the legal funding is being provided by Cousins alone. They have neither sought nor been offered financial support from any other source.

I would be grateful if you could correct this aspect of your piece, as I would not want any of those who contributed to the Industry Action Fund to think that their money was used for anything other than the purpose that they donated it for.

Please feel free to contact me for confirmation of any information as this story progresses, I would be happy to assist.

Kind regards,

~Steven Domb
Consultant to Cousins UK
steven@thinkplanwin.com

Writers for *Horological Times* can earn between $300 and $875 or more per article. It depends on the length of the article (25 cents per word). Earn a 10% bonus for submitting assigned articles early or on time. If you'd like to write for *Horological Times*, email editor@awci.com for guidelines.



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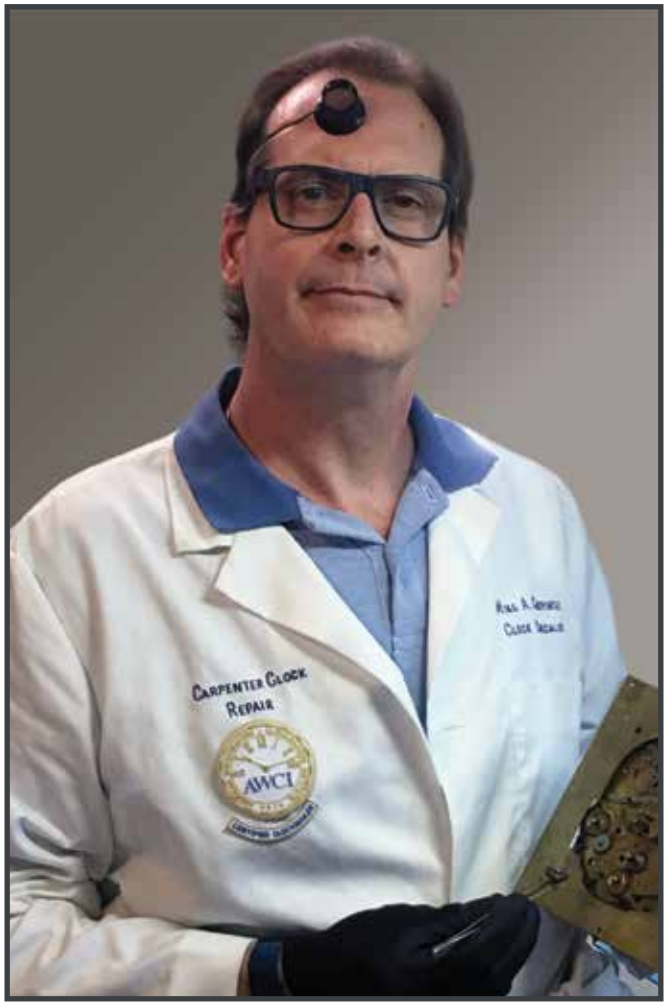
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A Letter from the Clock Director



Hello, members! My name is Mike Carpenter, and I am the new Clock Director at the American Watchmakers-Clockmakers Institute. I have taken on the task of getting the clock certification program up and running again. Fellow Jerry Faier, CMC21, and John Bryant, CC21, will be my guides as I establish future classes and educational programs.

I have been around clocks and clockmaking all my life. My mother, Mary Carpenter, started the family business in 1976. The business name was simple: Carpenter Clock Repair. I helped her with clock repair during summer breaks from school. After I finished college in 1990, I took over the business. I realized that if I were to be professional about running the business, certification was essential on many levels. Not many institutes in America had horological programs in 1990. The ones that did were auxiliary classes that seemed like a side note to more-established degrees like mechanical engineering. The American Watchmakers Institute was the most logical choice. (The addition of "Clockmakers" to the title came later). Here was an institute devoted to the training, promotion, and study of horology! I studied and prepared for the exam for three years before I felt confident enough to attempt the certification test. I became an AWI Certified Clockmaker in 1995. I was so thrilled to be a Certified Clockmaker. Few people who restored clocks back then were certified. Even today, I believe there are fewer certified horologists than there were in the 1990s.

Since then, AWI has acquired the "C", and the clock certification assessments have been upgraded. Currently, if someone wished to take the CC21 assessment, they would be told that the assessment is on hold. My job is to put the process on the "active list" again! First, I must complete the CC21 assessment

myself. The old AWI certification is not nearly as comprehensive as the current CC21 assessment. Second, I could use the help of the membership in this regard. The available data is not current. An updated list of willing mentors for the CC21 assessment is needed, for example.

I also plan to implement educational clock programs designed to help the members increase their fundamental skill sets and income levels. I am researching the feasibility of doing satellite classes offered in various areas of the country to help increase the accessibility of education. Once that is established, more advanced classes on clock restoration will be reviewed. I remember taking some advanced AWCI classes with Roy Hovey on clock restoration in the 1990s. Perhaps classes at that level of instruction can happen again in the near future!

I need your help! Please contact me with ideas for classes.

One of my personal goals is to become a Certified Master Clockmaker of the 21st Century *and* a Certified Watchmaker of the 21st Century. My skill sets are not there yet, but I plan to continue my learning and education until I will be ready for further certification.

As I mentioned earlier, I need your help! Please contact me with ideas for classes. A survey will be generated and sent out through various channels. Please be sure to fill it out and send it in. There will be more information on CC21 mentoring in the next issue of *Horological Times*, but if you wish to know more please contact me at clocks@awci.com or send mail to Clock Director, c/o AWCI, 701 Enterprise Dr., Harrison, OH 45030. I look forward to hearing from you and hope to meet everyone at the upcoming convention in Tampa, Florida.

~Mike Carpenter, CC





"Not coming to AWCI for education would have been the worst mistake of my career."

~Armen Anserlian

TIME IS MONEY

Increase the quality and quantity of your work and become more profitable with classes from the American Watchmakers-Clockmakers Institute. We offer refresher and advanced courses designed to help you sharpen your skill set and stay current with the latest service techniques.

ARE YOU CERTIFIED?

Invest in yourself by taking your skills to the next level, and becoming a Certified Watchmaker of the 21st Century (CW21). Becoming certified demonstrates your high level of expertise to your customers, elevates your store above the competition, and enhances the brands you carry. Start the process today by registering for our 21st Century Standards Course.

Not sure which course to sign up for? Log onto our website and fill out our experience questionnaire or contact us so we can help you find the best course suited to your skill level, expertise, and interests.



Call or email our Education & Certification Coordinator today for more information at education@awci.com or call 1-866-367-2924, ext 303

educational calendar

Prices reflect member's discount! Contact us so we can help you find the best course suited to your skill level, expertise, and interests.

Class Schedule for 2017

Reserve your spot today. Contact Rob McLeod at 866-FOR-AWCI (367-2924), ext. 303.

September 11-15

WATCH 230: **$1,095**

Balance Staffing & Timing

Instructor: Tom Schomaker, CMW21
AWCI Headquarters, Harrison, Ohio

Build on what you know in this course by investigating the verification and analysis of the escapement function, poising (static and dynamic), truing, and timing adjustment in a mechanical watch, cutting out a balance staff on a lathe, adjusting the balance staff, and removing the balance staff from Glucydur balances with the Horia tool.

September 18-22

WATCH 220: **$1,095**

Modern Mechanical Chronograph—ETA 7750

Instructor: Tom Schomaker, CMW21
AWCI Headquarters, Harrison, Ohio

Brush up on your chronograph skills before taking the CW21 Exam with this class on the modern mechanical chronograph. It focuses on the service and adjustment of modern mechanical chronographs, such as the ETA 7750.

September 23-24

$1,500

Modular CW21 Exam "Chronograph & Theory Components"

AWCI Headquarters, Harrison, Ohio

The Modular CW21 is an opportunity to start the process of taking the CW21 Exam by first taking the Chronograph course listed above, and then taking the corresponding Chronograph and Theory Components of the exam.

October 2-4

3 CEUs **$350**

Atmos Clock Repair Workshop

Instructor: Jeff Hamilton, CMC
To register, contact Abby Krouse at education@nawcc.org.
Tampa, Florida

For advanced students wanting to learn to repair the Atmos clock. Hands-on practice in component definition, part handling, disassembly, cleaning, assembly, troubleshooting, and testing.
For more information visit: **www.nawcc.org/atmos**

October 4

.5 CEUs **$75**

Chronometer Club—Chronometer Watches & CAD-CAM and CNC for Watch Repair

Instructor: Ernest Tope, CMW21
Tampa, Florida

This introduction to the chronometer escapement and chronometer watches will explore several types of chronometer watches, including the current co-axial escapement used by Omega. Then take part in a discussion of CNC and CAD-CAM basics, followed by a demonstration. No tools are required. A loupe is recommended for close examination of samples.

October 4-8

AWCI Annual Convention & Educational Symposium

Tampa, Florida

Registration available at
www.awci.com/symposium.



Be energized by your colleagues and inspired by the education!

- Learn new methods and techniques
- Earn up to 1.5 CEUs at the convention
- See the latest tools and technology
- Meet industry leaders
- Create relationships that will last a lifetime

The schedule for 2017 includes classes on American Style Time & Strike Movemment, Servicing the Accutron, Appraising for Clockmakers and Watchmakers, Selecting & Maintaining a Lathe, and much more!

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October 9-13

WATCH 175: 5 CEUs **$1,350**

Case & Bracelet Refinishing (includes polishing kit)

Instructor: Tom Schomaker, CMW21
AWCI Headquarters, Harrison, Ohio

Today's luxury watch consumer demands perfection. This course is perfect for the watchmaker or dedicated refinisher. It will help you achieve the different finishes on modern watch cases. Also covered is disassembly and assembly of common watch cases.

October 27-29

3 CEUs

Florida Watch & Clockmakers Association (FWCA)

Instructor: Tom Schomaker, CMW21
Fort Lauderdale, Florida

Tom Schomaker, CMW21 will be teaching a lathe class aimed at improving the skills of both beginners and seasoned professionals. This 3-day class will challenge you regardless of your experience, and leave you with a better understanding on the proper way to use the lathe in your shop. For more info email Fabio Rodrigues at **fabusa@me.com**

Plan Ahead! 2018 Classes Now Available!

February 5-9	WATCH 190: **21st Century Watchmaking Standards** Instructor: Tom Schomaker, CMW21 AWCI Headquarters, Harrison, Ohio	$1,095	Understanding the fundamental expectations of manufacturers, consumers, and industry in modern watch repair. Evaluate your skill set in this course by exploring the fundamentals of modern mechanical watch repair including cleanliness, lubrication, endshake adjustment, and may include the verification and analysis of escapement function.
February 19-23	WATCH 210: **Quartz & Quartz Chronograph Service Procedures & Diagnostics** Instructor: Tom Schomaker, CMW21 AWCI Headquarters, Harrison, Ohio	$1,095	Expand what you know to increase your profit! Quartz watches can be one of the most profitable sectors of your business. This course reviews quartz watch repair and quartz chronographs, including the various important electronic tests, giving you the skills you need to be faster and more consistent at servicing quartz watches.
March 5-9	WATCH 220: **Modern Mechanical Chronograph-ETA 7750** Instructor: Tom Schomaker, CMW21 AWCI Headquarters, Harrison, Ohio	$1,095	Brush up on your chronograph skills before taking the CW21 Exam with this class on the modern mechanical chronograph. It focuses on the service and adjustment of modern mechanical chronographs, such as the ETA 7750.
March 19-23	WATCH 230: **Balance Staffing & Timing** Instructor: Tom Schomaker, CMW21 AWCI Headquarters, Harrison, Ohio	$1,095	Build on what you know in this course by investigating the verification and analysis of the escapement function, poising (static and dynamic), truing, and timing adjustment in a mechanical watch, cutting out a balance staff on a lathe, adjusting the balance staff, and removing the balance staff from Glucydur balances with the Horia tool.
April 2-6	WATCH 240: **Servicing the Lever Escapement** Instructor: Tom Schomaker, CMW21 AWCI Headquarters, Harrison, Ohio	$1,095	This intense 5-day course will help you refine your escapement adjusting skills. The course covers all of the adjustments for the Swiss lever escapement, hairspring, and balance. Also covered is the ETAchron system.
April 23-25	**CW21 Exam** AWCI Headquarters, Harrison, Ohio	$2,495	Get certified today, the CW21 Exam is a 3-day examination covering topics in the AWCI Standards & Practices. If you are interested in becoming a Certified Watchmaker for the 21st Century please contact Rob McLeod, AWCI's Education Coordinator for possible availability 866-367-2924, ext. 303. An exam application and a notarized affidavit is required at time of registration.
April 26-27	**CW21 Retakes** AWCI Headquarters, Harrison, Ohio	Prices Vary	Only available to past examinees needing to retake just a portion of the CW21 Exam. For additional information, contact Rob McLeod, AWCI's Education Coordinator, 866-367-2924, ext. 303.

For additional details about specific courses in comprehensive syllabi form, including complete tool lists, visit: **www.awci.com/classes** or contact **Rob McLeod**, Education & Certification Coordinator, at 866-FOR-AWCI (367-2924), x303. For additional calendar events visit: **www.awci.com/calendar**.

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By Terry Kurdzionak

It's time for the last-minute plans to attend the annual convention of AWCI. Pack your bag and get ready for some Florida sunshine! What to pack? Sunglasses, sunscreen, hat, bathing suit, cover-up, flip-flops, sandals, regular clothes for the meetings, and "dress up" for the reception and the Awards Banquet. Don't forget a sweater, wrap, or light jacket, just in case we have a cool night. The average temperature at this time of year in Tampa is 84° during the day.

Each evening from 9:00–11:59 p.m., we will have the hospitality suite open for all members, plus-ones, vendors, and presenters to enjoy. We will have alcoholic and nonalcoholic drinks, and snacks available, as well as great conversation and networking. This year, we have two adjoining rooms with an outdoor patio on the ground floor, along the corridor to the tower elevators of the hotel. These hospitality rooms are a short walk from the lobby.

Our meeting space is close to the lobby, but away from the rest of the hotel traffic. We have a large area outside the meeting rooms where we will have our Friday and Saturday luncheons. Thursday, you will have lunch on your own. There is a pub-style restaurant just off of the lobby called "Players" where you can order lunch or, outside across the parking lot, there is a steak house within easy walking distance. If you are a plus-one and go out with that group on any of those days, your lunch will be provided at one of the restaurants within your trip. Each morning, your breakfast is complimentary and will be served in the hotel breakfast area, right off of the lobby at the end of the corridor.

The sign-in table for all of you will be in the lobby area. You can check into the hotel first if you like, and then check in at the AWCI table where you will receive your name badge and other information. If there is a line at the hotel, feel free to check in at the AWCI table first. When you sign in, we will have a schedule for the tours of the Hadley-Roma strap factory in Largo, Florida. The tours will be held beginning at 1:00 p.m. on Thursday. When the first group returns, the second group will leave. Each group that is not on the tour will have an opportunity to attend a micro-class given by some of the vendors.

You will receive a full schedule of the educational offerings with the time and room assignments when you check in. Parking at the hotel is ample and free. There is also a complimentary airport shuttle. Unfortunately for the train lovers among us, train service to Tampa ended several years ago. Amtrak now goes as far as Orlando, and you would need to get to Tampa from there, just under a two-hour drive.

Dinner will be "on your own" Thursday night, and the Board of Directors will meet that evening. You are all welcome to attend that meeting and are encouraged to do so. Any business not completed by the board Thursday evening will be continued on Sunday morning. When that meeting is over, the 2017 convention will then be history.

Our banquet on Saturday evening begins with a reception with a cash bar, followed by a dinner and awards ceremony. Our last evening for the hospitality suite will be after the Awards Banquet.

As always, if you have any concerns or questions please email me or call me, and I will assist you. Email terrykurdz@gmail.com or call 781-454-8751. I'm looking forward to seeing you in Tampa!

P.S. *If any of you take any medications, always pack an extra day's worth. Once a nurse, always a nurse.*

Terry Kurdzionak is a graduate of Northeastern University College of Nursing. She has been involved in the family watch/clock/material business for 28 years and has served as an officer and board member of AWCI as well as the membership and convention committees.



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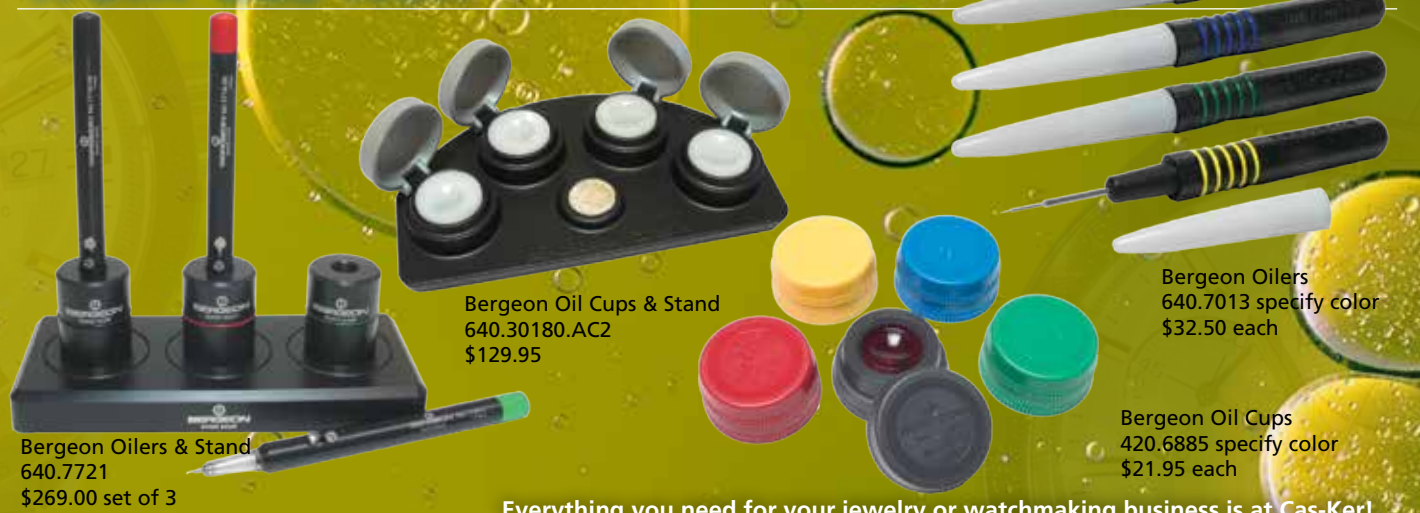
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From Australia to America

Observations of an Australian Watchmaker

By Oliver Broos Revitt



Part II. Taking the CW21 Exam

This exam has a reputation. . . . It ain't easy, and I think it's made harder by the fact that everyone just wigs out when they are there taking it. When I first signed up to this exam six months prior, I didn't know what I was getting myself into. Through numerous phone calls and emails, the gravity of what I was undertaking became evident. Early on in the planning phase, I asked myself, "What am I doing?" From my understanding, no one from Australia had ever attempted it before. I had no idea how it was run and didn't know what to expect. I didn't know anyone who had completed it, and when reaching out to people online, I was met with no response. After reading the guides and notes about the exam, I drew up a rough plan. I would just like to point out—*you need a plan*. You cannot do this exam without one. It just makes life so much easier because once nerves kick in, you can get tunnel vision—and trust me, you will.

I broke the exam up into numerous sections and broke down the skills needed for each watch. I had five months to go, so I divided my time up. I allocated an amount of time for each skill: Hairspring manipulation, truing of wheels, timing, balance staffing, theory, chronograph adjustments, and quartz. During the week, I would come home after work and do theory and prepare my notes. I allotted stacks of time for this, as theory is such a big area to cover. For about three of the months, I was working a full day Saturday to save some extra money. So, this really only left me Sunday. Every Sunday I would practice for 10 hours a day all the skills required. I would literally spend a whole day just adjusting balance springs. I would introduce problems into old watches we had lying around and then repair them. To practice on the Etachron system, I would try to chronometer rate any watch I did. If they were running well, I would unadjust them and start again. I was cross-referencing the theory of timing with these while doing this. The whole time I was checking how the spring would act when against one of the curb pins, or how the timing changed when I opened or closed the curb pins. Hairspring adjusting was one of my weaker points, so I spent a lot of time on this. This went on for months with all the topics. Repetition was the key. I had no free time and watchmaking just became my life. It became boring at times but I pushed through. When you calculate the time spent, it adds up really quickly.

Timing is everything.

So, fast forward to September 2016 and the convention is on. I wrote about my experiences at the convention in last month's HT, but I would like to start back up from meeting Craig Stone. As mentioned earlier, I wanted to spend some time at a bench, as

three weeks off a bench before an exam is a long time! Craig agreed to have me, and double checked with his wife before bringing a stranger home (smart move, Craig). On the last day of the convention, we headed off to Quincy, Illinois, which is where Craig lives. It is approximately a five-hour drive. . . . I can't quite remember; maybe Craig is just a slow driver.

I was met with warm hospitality, and it felt just like home. Over three days, we covered many different topics, and he answered all of my questions. I asked Craig to be tough and to critique my work, and he did. Coming from Australia, I had no idea of the standard required in the US and whether or not I would even be close. I knew I had to produce my best possible work. I knew the exam was hard, but it wasn't until I sat down and had Craig review my work that I knew what I had to do. When it wasn't good enough, I did it again and again. This continued on for three days—good fun! Having someone be very critical of your work and push you to be better is an invaluable help. I can understand how some people don't feel comfortable with others providing constructive criticism of their work. I get it . . . but if you wish to improve, you have to take constructive criticism. In hindsight, I would not have even stood a chance if it weren't for Craig. For that I am forever grateful.

The exam gives you a platform to test your skills to an extremely high standard.

Craig, his lovely wife, Sara, and their daughter, Allea, showed me Quincy and took me out for dinner and lunch. Probably one of the highlights of the whole trip was getting to shoot guns. You have to remember guns are illegal in Australia, and it's nearly impossible to get a license for one. So, shooting for the first time was scary, but it was an amazing experience. Because of this time spent with Craig, I regularly stay in contact with Craig and created an amazing friendship in the process. This never would have come about if it weren't for the annual AWCI convention.

When it was time to take the exam, I arrived in Harrison, Ohio, on Thursday afternoon, three days before the exam, to familiarize myself with the facility. I spent the time studying and practicing. Fast forward to Monday. I arrive 30 minutes before the exam, and everyone is waiting out front. You can tell there is some tension in the air. It's a bit cold and everyone is kind of quiet. Once the exam room is open, everyone picks their benches and starts setting up. I had a plan and I stuck to that plan. However, I did run out of time. I had to rush the chronograph through because there were unexpected problems, such as the fact that I was dynamically poising my 6498 wrong! Before I realized. . . oops! Timing is everything. I found that I spent more time on things than I normally would have. I was even more cautious, making me slow down. Everyone handles stress in different ways. I handle it by being a bit silly; I try not to think of the gravity of the situation.

Two weeks after the exam, I returned home to wait for my results. You can only imagine how I felt when I got my results. . . I failed. I got 91.4 for my Theory (very happy). I got 4.4 out of 5 for the micro-mechanical (woooo!). I got 4 out of 5 for the Quartz (great). But 3.39 out of 5 for the Chronograph (ouch).

I phoned up Rob McLeod, the education and certification coordinator, and said, "G'day mate." He

knows who I am when I phone (it's the accent). Rob said, "I'm sorry, Oliver, about your results." I said, "Mate, don't worry about it. It happens." This was the first time I had failed anything. My only concern was when could I do my retakes. And, if you're wondering, I will be coming back to do the chronograph module.

There are many reasons people take the CW21 Exam. When people fail, they often reflect back on the reasons they undertook it and what they were trying to achieve. Some may take the CW21 Exam for professional accreditation, to help get a parts account, to improve their repair skills, or to help improve their business and differentiate it from the competition. But whatever the reason, all that matters is that it's important to *you*. For me, I just wanted to challenge myself. I wanted to see where I stood in the States in terms of standards. There is no financial benefit for me in undertaking this test. No one here in Australia knows what it is or what you get out of it. Colleagues of mine all think I'm crazy, as they don't see any benefit to it. They ask, "Why do another test when you're already qualified." Or they say, "You already know all these things." The point they missed, and most people miss, is it gives you a platform to test your skills to an extremely high standard.

Looking back, I wish I had taken a course (such as the chronograph course or the timing course) to prepare for the exam. I would encourage anyone to take a course or two in preparation for the exam, just to help you brush up on old skills or learn new skills.

There are two people who provided me with great advice and who I would like to thank. Tom Schomaker and Jordan Ficklin. Tom was a great help to me on numerous occasions; without his knowledge and guidance, I would be lost. I wish I could attend all his courses, as he has a wealth of knowledge and a passion for watchmaking. In my opinion, he makes up the backbone of AWCI education and works tirelessly to produce classes for us watchmakers. Thank you, Tom, for spending what time we had together. You were a great help, and I'm really looking forward to attending one of your classes. Jordan works tirelessly in the background. He is a workhorse; this organization would not be the same without him. Just remember that all the planning and organization he does helps AWCI events run smoothly. So, to everyone I met, spent time with, laughed with—thank you for making it such a fun experience. I hope to see you all again!

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Oliver Broos Revitt works for an independent watchmaker in Australia but frequently travels abroad to meet other watchmakers.

National Association of WATCH & CLOCK Collectors, Inc.
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NAWCC Philadelphia Chapter 1 Scholarship Grant for 2018

The directors of the Philadelphia Chapter No. 1 of the National Association of Watch and Clock Collectors, Inc. cordially invite all interested and qualified individuals to apply for a scholarship grant to attend a recognized school of horology in the US or an NAWCC traveling workshop. One or more grant awards of up to $500 are planned and may be used to cover all or part of the tuition and registration costs for a single course of study at a recognized school of horology or a NAWCC traveling workshop.

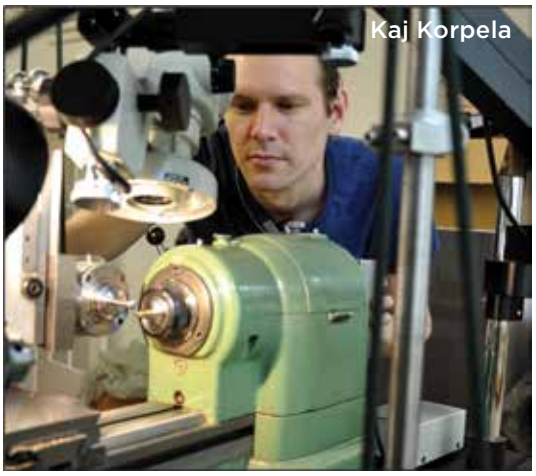
Lists of NAWCC workshops are available at www.nawcc.org. Membership in the NAWCC by applicants is preferred but not required. Previous award recipients may be eligible for a second scholarship at the directors' discretion. Guidelines for award of the scholarship are summarized on the application form.

Application Deadline: October 15, 2017
Awards will be announced by: December 1, 2017.
For additional information contact:
Charles Buttz
Chair, NAWCC Chapter No. 1 Scholarship Committee
570-595-3306 or email him at
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The application form may also be downloaded from the NAWCC website. Go to www.nawcc.org, then click on Education and scroll down the page, and click on Application for Chapter One Scholarship Grant.

Making a Watch from Conception to Finished Product with Kaj Korpela

Watchmaking, Prototyping, and Restoration of Watches

PART NINE



By Henrik Korpela

We have now reached the final movement part: the oscillator, which is comprised of the balance with its related parts and the hairspring. Then, I'll cover the case, dial, and hands in the next and final part of this series. In this part, I also include a restoration tip on how to shape and fit a Phillips curved overcoil hairspring, as well as how to use the CGS system on both overcoil and flat hairsprings.

The balance was made from a type of beryllium copper that was recommended by Kaufmann & Fils SA, a specialist metal supplier to the Swiss watch industry. Visit www.osha.gov/SLTC/beryllium/ to learn of the possible health effects of working with beryllium copper. Kaj decided to have a monometallic balance with timing masses (inertia weights) made out of white gold, with a diameter of 10.10mm and a height of approximately 0.55mm, Figures 1-2. The hairspring was to be of Nivarox 1 metal with a calculated CGS of 1.34, but the closest he found was 1.40, which turned out in practice to be a good size. He made the hairspring overcoiled and free sprung. Since Kaj had decided previously to have a gear train running on 21600 vph, he also had to vibrate the oscillator to that frequency. He first roughly vibrated with a camera on film mode, which he then used to visually calculate the number of vibrations per minute. This

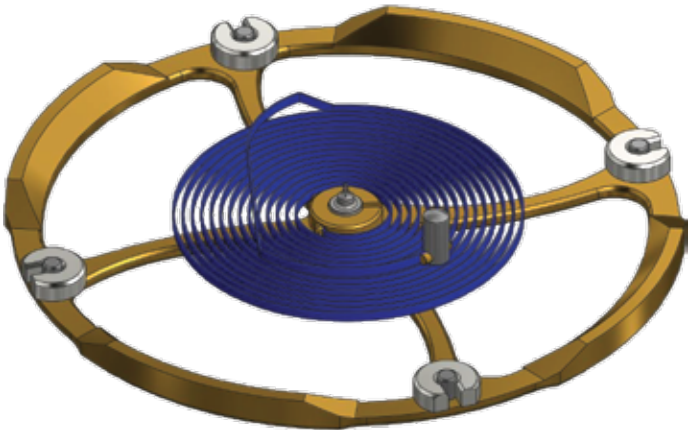


Figure 1. Design of the balance with overcoil hairspring and four timing masses.

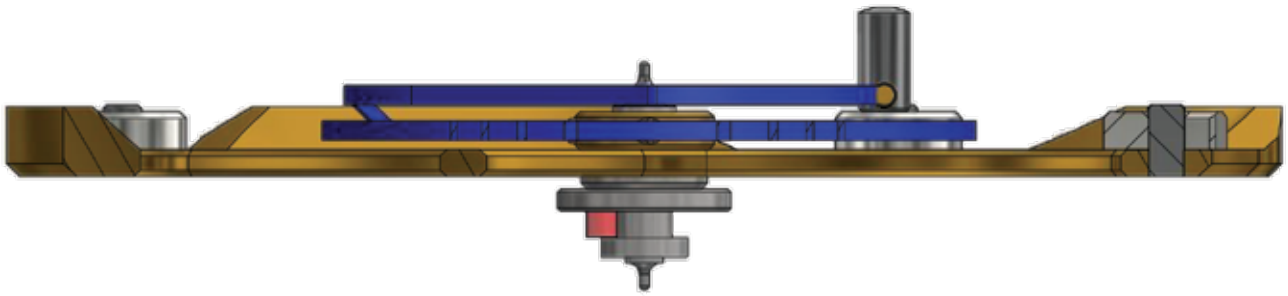


Figure 2. Oscillator cross section.

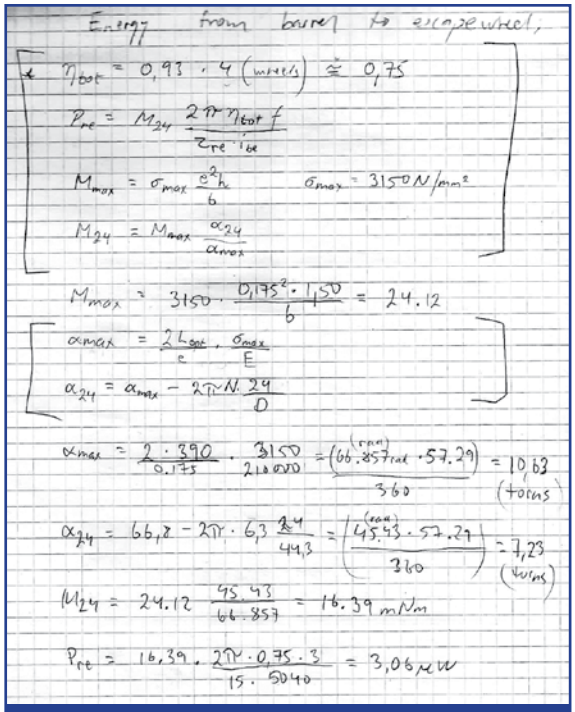


Figure 3. Calculations for energy at the escape wheel.

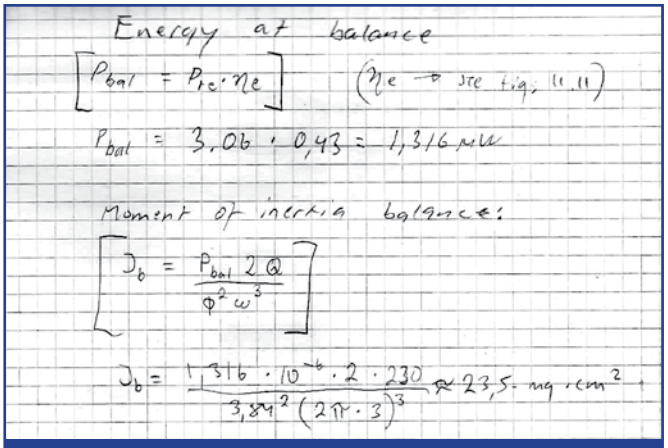


Figure 4. Calculations for balance energy and moment of inertia.



Figure 5. Turning the balance staff.

was close enough to then do the final adjustments with the Witschi Chronoscope X1 timing machine. Because of the already calculated energy at the escape wheel (P_{re}) of 3.06 μW[1], Kaj calculated the energy at the balance (P_{bal}) to be 1.316 μW with a moment of inertia of the balance (I_b) to be 23.5 mg·cm² for the chosen diameter of 10.10mm and 0.55mm thick balance,[2] Figures 3-4. The calculations should only be regarded as a starting point. In the end, everything must be fine-tuned to give the optimum results. When Kaj tried a mainspring with the calculated dimensions, he found it was a little too strong, producing too much energy. Therefore, he had to use a slightly thinner mainspring.

Kaj first turned the balance staff, Figures 5-6, in the Schaublin 65 using the boom stand microscope to help him see better. The entire balance staff was turned with it. Because the cross slide had digital readouts, it was much easier to measure diameters and length during the actual turning, and also prevented the need to ever take out the piece for measurements, which keeps it concentric. The only thing left to turn after the 65, was the final turning of the pivot diameters between centers in the turns, and the burnishing with the Jacot tool. Since the balance staff will operate within the tourbillon cage, the space is very limited. Therefore, the balance staff had to be designed to be very short—1.79mm was the total length. Also, the sideshake had to be kept to the minimum, with 0.075mm diameter pivots and 0.08mm jewel hole diameters.



Figure 6. Balance staff ready to be riveted to the balance.

1. Michel Vermont et al., *traité de construction horlogère* (2011), 649-655.
2. Vermont et al., *traité de construction horlogère* (2011), 656-659.

Kaj also decided to make supports for the tourbillon and mainplate, so he could handle and assemble them more comfortably and safely. This was crucial because, at this stage, you don't want to risk anything. With so much time invested in this project, it would be foolish to assemble the watch in a difficult manner, without the necessary tools and supports. Also, when you design your own movement or mechanism, you should be able to assemble it. You could actually design a movement or mechanism so that in the end it is impossible to assemble it. Imagine: after all the work you have done so far, you realize in the final assembly that it's actually impossible to assemble it at the bench.

Since the escapement is in direct contact with the balance and influencing the timekeeping, Kaj also needed to make various final adjustments to the pallet fork. Once Kaj got the escapement fine-tuned, the watch made its first ticks and tacks, without the hairspring fitted.

During the period when Kaj was adjusting the escapement, he also machined a stud holder to be fixed on the tourbillon cage around a tube also carrying the shock absorber, Figures 7-10. First, he sawed out a piece of Sandvik 20AP steel that he glued on a flat brass support, and then drilled the central hole and the hole for the stud in the Hauser M1 jig-boring machine. Then, he transferred this center to the lathe to bore out a step. The piece was again transferred to the M1 for scribing the outside shape and milling it to correct length. Finally, he heat treated it and filed it with various diamond files to final shape. The stud was made in the lathe, and the hole was drilled in the Hauser M1 jig-boring machine, with the help of accessories from the Aciera F1 milling machine, Figure 11.



Figure 7. Turning a step for the stud holder in the lathe.



Figure 8. Scribing the outside shape in the M1.

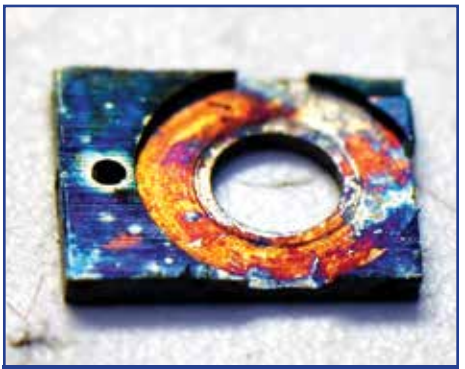


Figure 9. After milling and heat treatment.



Figure 10. Stud holder after hand filing and some basic finishing.

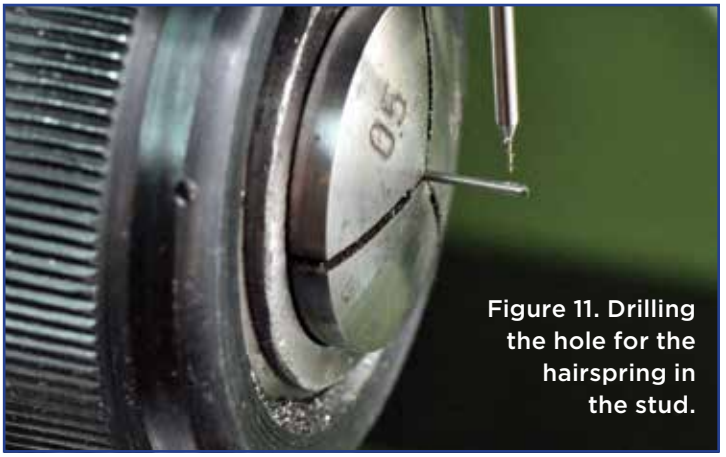


Figure 11. Drilling the hole for the hairspring in the stud.

The next step for Kaj was to make the balance. He made it from a bar of beryllium copper, first turning the outside diameter, drilling a central reference hole, and finally parting it off in the 102. Notice that Kaj parted off the balance with the graver upside down. The spindle would also turn in the clockwise direction (which is opposite of "normal" turning), Figure 12. Apparently, it's more stable this way, producing fewer vibrations and, therefore, less risk of accidents during the parting operation.

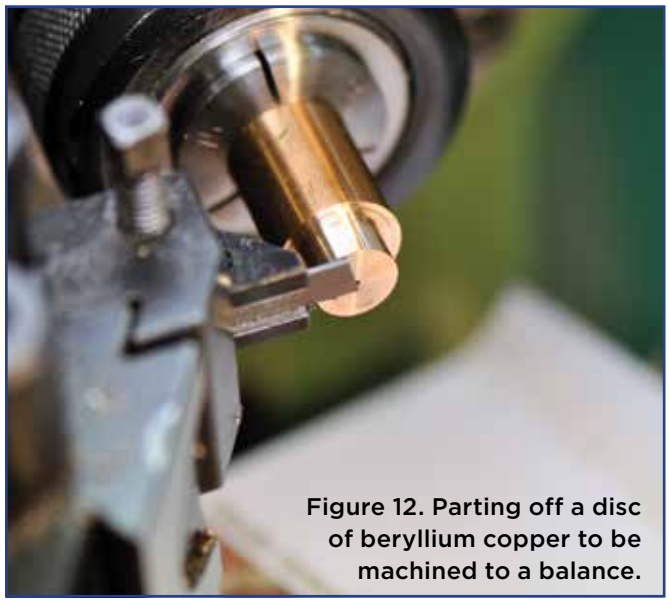


Figure 12. Parting off a disc of beryllium copper to be machined to a balance.

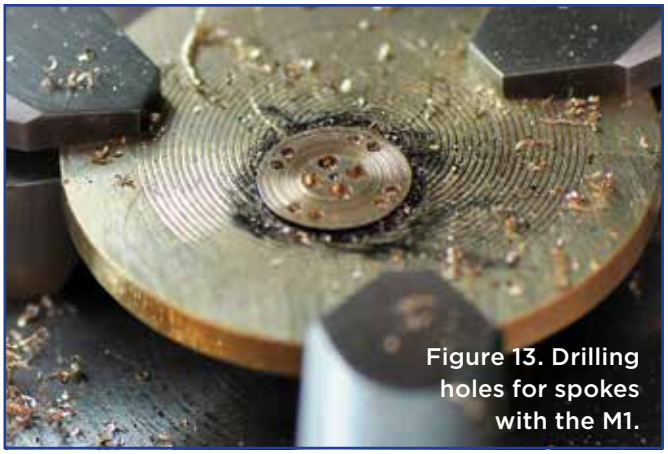


Figure 13. Drilling holes for spokes with the M1.



Figure 14. Boring and milling the balance in the 102.

The beryllium disc was then drilled in the M1, Figure 13, to be able to cross out the spokes later. Also, the holes for the timing mass pins were drilled. The entire faceplate with the balance was then transferred to the 102 and a step with an angle for the rim was bored out, as well as the area for the timing masses milled flat with the F1, Figure 14. This was all done on the same faceplate without having to remove the balance. With a mini-vise holding the balance, clamped in the bench vise, the spokes were crossed out by hand filing with various escapement files, Figures 15-16.



Figure 15. Filing the spokes of the balance.

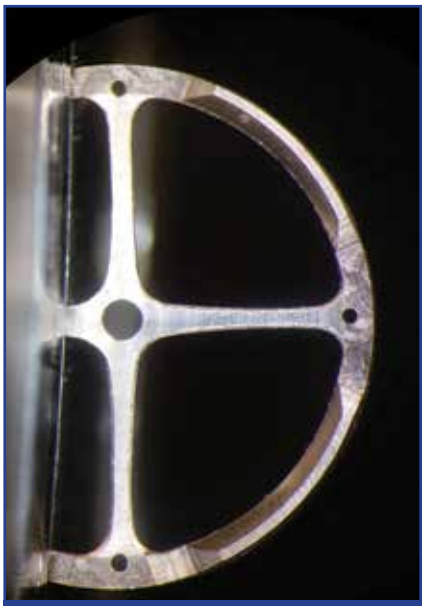


Figure 16. Crossed out spokes.

The balance was then assembled together with pins and inertia masses, the balance staff riveted to the balance, double roller friction fitted to the staff, and the assembly statically poised, Figure 17. Finally, a hairspring was vibrated for it. Once the balance was ready with the now-shaped overcoil and vibrated hairspring, it was put in the tourbillon cage with its escapement, and that whole assembly was statically poised exactly in the same way as the balance. The entire movement was now assembled and ready to start the timing adjustments, Figures 18-19.

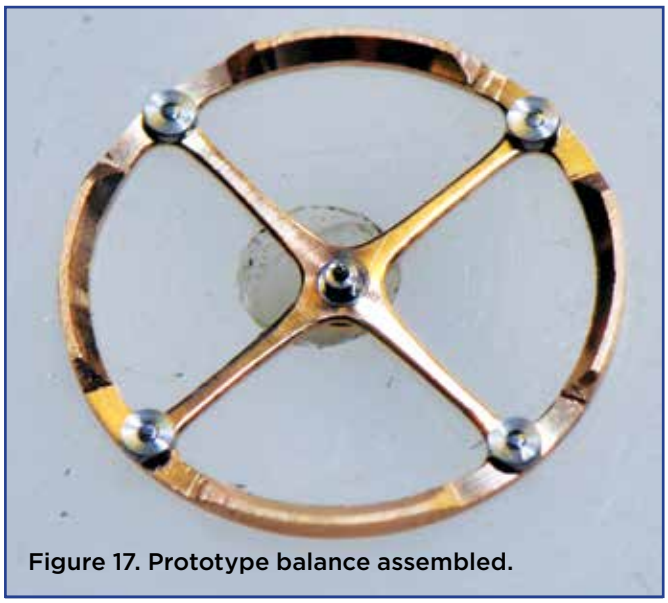


Figure 17. Prototype balance assembled.



Figure 18. Prototype movement assembled for initial timing work.



	R0h	R24h	B0h	B24h	A0h	A24h
CH	10.6		0.8		301	
CB	7.6		0.9		282	
9H						
6H	8.5		0.9		267	
3H						
12H						
X	9		0.9		283	
D	3		0.1		34	
DVH	-1				-25	
Di	-2					
Im*			N*			

Figure 19. Timing results after some adjustments.

Fitting, Vibrating, and Forming a (Phillips Shape) Overcoil Hairspring Using the CGS* System.[3]

- First, make sure you know the frequency of the watch (by calculating the gear train).
- Take any hairspring that is close to the size of the one fitted, but with a known CGS number.
- Fit the hairspring to the collet temporarily; no need to make the hairspring perfectly flat and centered for this first vibrating.
- Vibrate the hairspring with a vibrating tool using the correct frequency master balance, measure its radius, and calculate the required CGS number with the formula below[4]

$$N = N' \left(\frac{R}{R'}\right)^2$$

N = CGS number to find

N' = CGS number of the test hairspring

R = Radius of hairspring needed**

R' = Test hairspring radius after vibrating

CGS: Abbreviation for Centimeter, Gram, and Second for the units of length, mass, and time.

***The diameter of a Breguet hairspring should be half that of its balance including the screws, and the radius of the hairspring is, therefore, half of that value.[5]*

3. G.-A. Berner, *Dictionnaire professionnel illustré de l'horlogerie 1+2* (2002), 185, entry 751.
4. Charles-Andre Reymondin et al., *The Theory of Horology* (2003), 139.
5. Hans Jendritzki, *Watch Adjustment* (2006), 36-37, 49.

- Choose the closest CGS-numbered hairspring according to the number you got from using the above formula.
- Collet and vibrate this second hairspring.
- Cut the hairspring, leaving exactly one coil extra from the vibrating point to remember where the vibrating point is. Later you will need some of this extra length because you will need to reach the stud with the hairspring.
- Calculate the correct Phillips curve. Each terminal curve or Phillips curve has a number that corresponds to its shape on a special template found in *Phillips Terminal Curves* by Bossart. This number can be calculated using the formula below.[6]

$$N = \frac{a \times 100}{R}$$

N = Number of Phillips curve

a = Distance from center of balance staff pivot to the central position between the regulating pins (or pinning position in stud on free sprung oscillators).

R = Hairspring radius.

θ = Angle between vibrating point before shaping curve ***(B)*** and final vibrating point after shaping of curve ***(C)***.

- Select the hairspring drawing that is as close as possible in size and also has the correct direction of coiling in the Phillips terminal curves tables.
- Put this drawing on a piece of wood with a pin in the center of the same diameter as the hole in the collet.
- Now put the hairspring on top of the drawing, with the pin in the hole of the collet. With the vibrating point at B, the curve will then start at A.
- Make the raised double bend to start at A; make the angle approximately 30°[8]; make sure the two bends are not too close to each other since it would limit the amount you can raise it.
- Reshape the curve according to the drawing, and your new vibrating point will end up at C. If the extra coil of hairspring bothers you when shaping the curve, you can remove some of it at this point because we now have marked the position of A by raising it at that point.

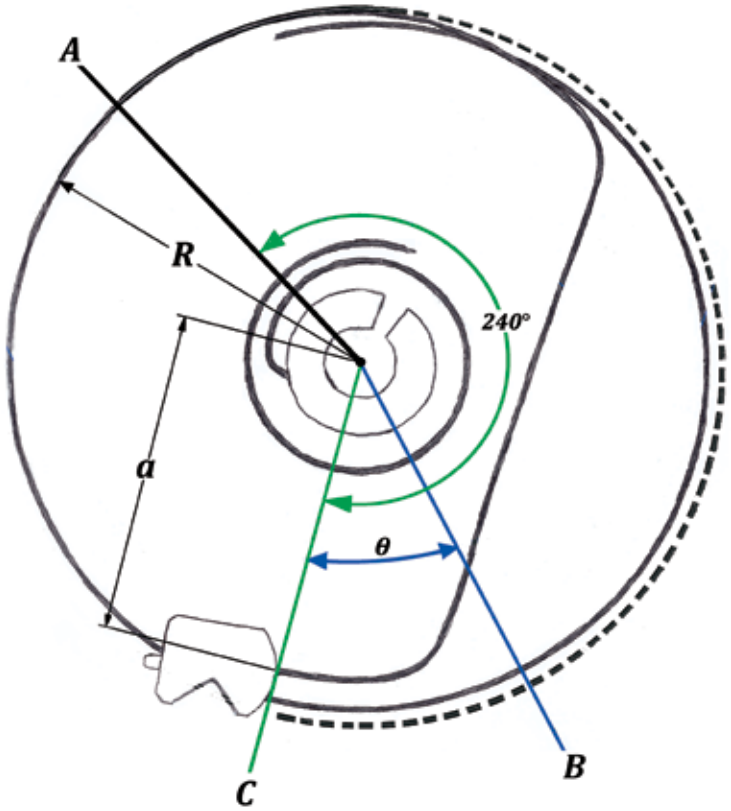


Figure 20. Drawing of an actual Phillips terminal curve.[7]

6. Reymondin et al., *The Theory of Horology* (2003), 141.
7. M. Bossart, *Phillips Terminal Curves* (1955).
8. Bossart, *Phillips Terminal Curves* (1955).

- Attach the hairspring to the stud so that the vibrating point ends up in the position of the regulating pin when the regulator finger is in the middle of the bridge. Trim it after the stud.
- Put the hairspring back on the balance staff of the balance in the correct position, and bridge and mount on the mainplate to adjust hairspring flat and centered under the bridge.

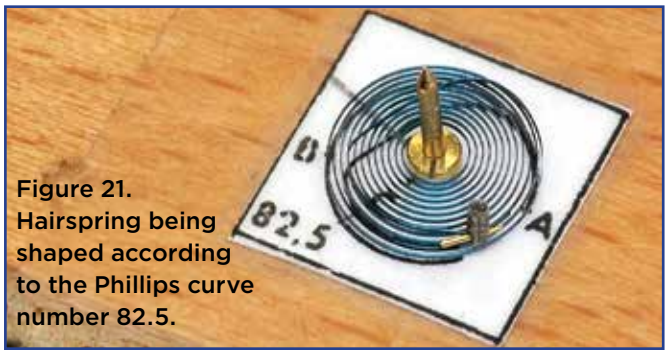


Figure 21. Hairspring being shaped according to the Phillips curve number 82.5.

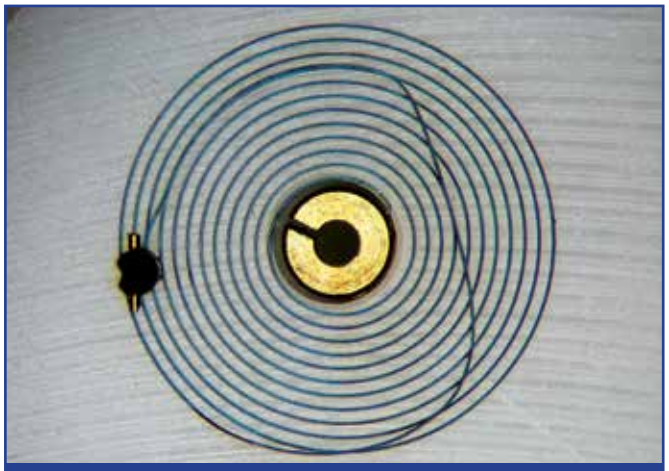


Figure 22. After forming and vibrating the Phillips overcoil hairspring.

Calculating the CGS for a Flat Hairspring

- Measure the distance from the balance staff pivot to the middle of the regulating pins. Remove one to one-and-a-half coils because the second coil close to the regulating pins must have space to move without touching the regulating pins when the balance is oscillating. This value represents ***R*** in the same formula used for the Breguet hairspring CGS calculation.
- Make sure you know the frequency of the watch (by calculating the gear train).
- Take any hairspring that is close to the size of the one fitted, but with a known CGS number.
- Fit the hairspring to the collet temporarily; no need to make hairspring perfectly flat and centered for this first vibrating.
- Vibrate the hairspring with a vibrating tool using the correct frequency master balance, measure its radius, which will give you R' and calculate the required CGS number with the same formula used for calculating the CGS for Breguet hairsprings.
- Choose the closest CGS-numbered hairspring according to the number you got from using the formula.
- Collet and vibrate this second hairspring.
- Cut the hairspring, leaving exactly one coil extra from the vibrating point to remember where the vibrating point is. You will need some of this extra length later because you will need to reach the stud with the hairspring.
- Finish the fitting with the usual steps: second pinning, flatness centering around collet, double bend, regulating curve, studding up, etc.

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Korpela, Henrik: Figures: 20-22

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Henrik Korpela is a watchmaker living in Switzerland and the principal of Korpela and Hofs Watchmaking Competence Centre.

VINTAGE 6/0 WALTHAM HAND REPLACEMENT

By Dale LaDue, CMW21

Repairing vintage watches in this age of diminishing parts supply is extremely frustrating. This article details the fitting of replica modern hands to a World War II-era 6/0 size Waltham wristwatch.

The hands that I chose closely matched the vintage skeleton style of Waltham wristwatches from that era, Figure 21. However, the hour and minute holes were too large. You can use a conical staking tool punch to close hand pipes and create a proper friction fit only if a slight adjustment is required.

In this case, I chose to create bushings that fit the hour- and minute-hand holes as well as the hour wheel and cannon pinion. I prefer to perform this procedure while the dial is mounted to the pillar plate. This allows access and stability to both the hour-wheel pipe and the cannon pinion's minute-hand shoulder while fabricating the bushings. Clearances between both hands as well as between the hour-hand pipe and center hole of the dial are also easily viewed. Be careful when working close to a dial; with careful attention and a modicum of skill, you won't touch the dial.

A brass rod larger than the hour-hand hole was mounted in the lathe and drilled. The drill used was smaller in diameter than the cannon pinion shoulder that the minute-hand mounts onto. A perfect center turned prior to drilling allows the drill to center itself. The prepared rod is shown in Figure 1. It is not critical that the hole be perfectly centered at this point. However, to create a concentric bushing, the hole was bored out, Figure 2. The hole was incrementally bored out, and frequently tested for a slight friction fit on the cannon pinion minute-hand shoulder, Figure 3.



Fig. 1

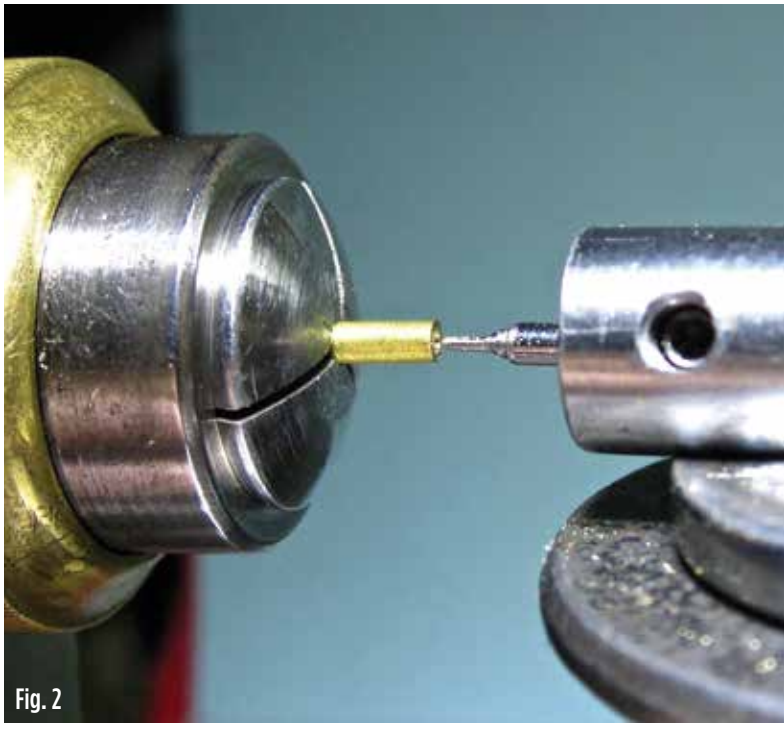
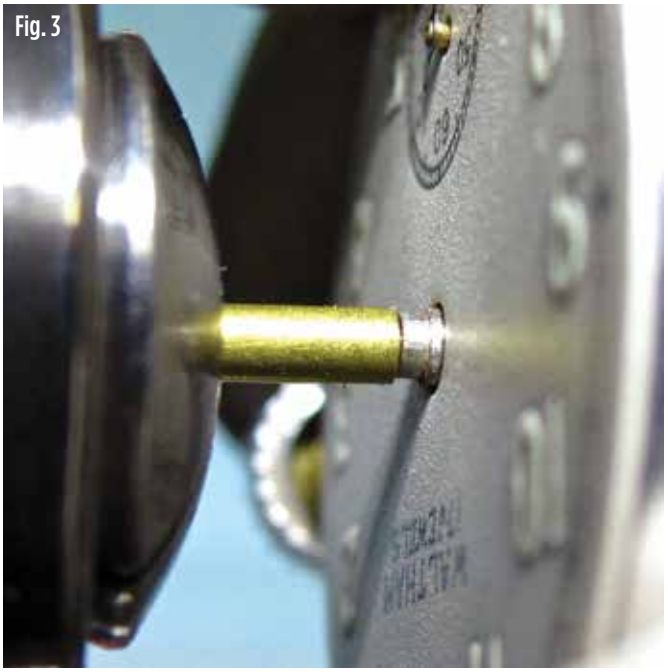
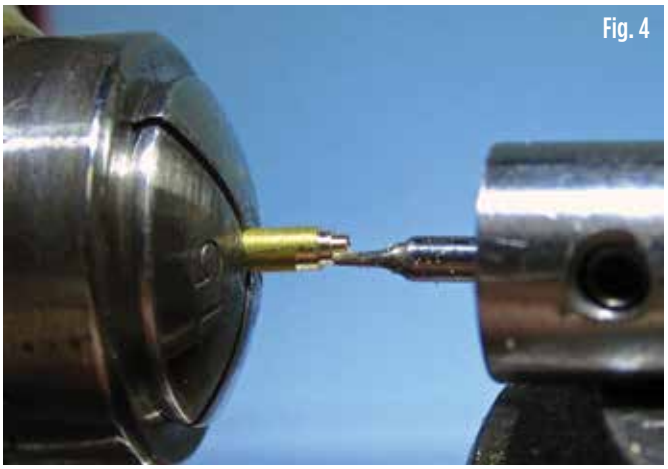
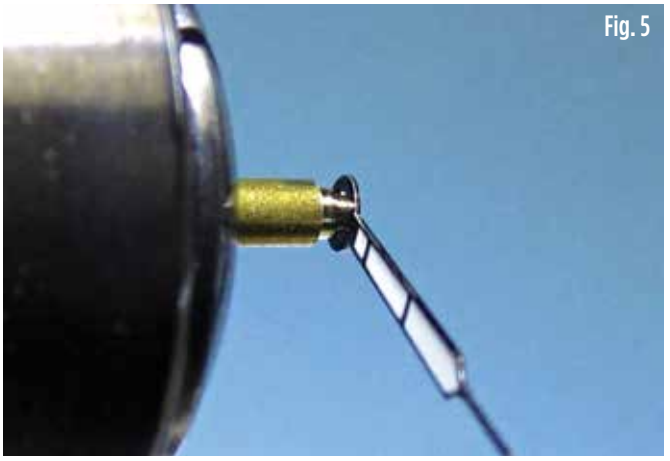


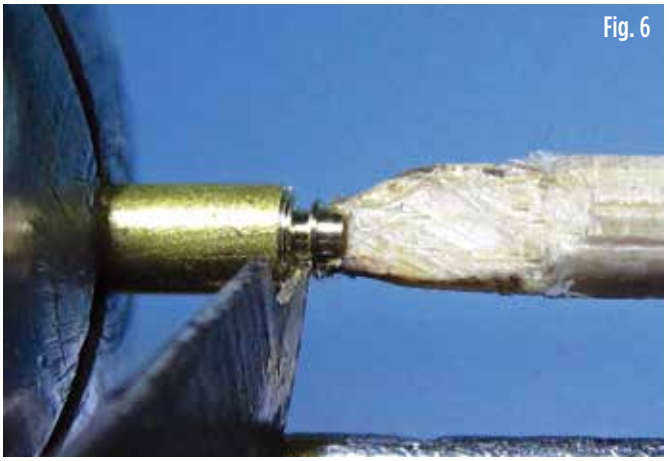
Fig. 2


Fig. 3

The next step was to turn down the outside diameter to fit the minute hand. The same cutting tool was used, Figure 4, and the bushing was tested frequently this time for a tight fit, Figure 5. The bushing was then parted from the stock with a small flange, Figure 6. To prevent the loss of the bushing as it breaks free, a piece of pegwood was inserted in the hole, Figure 7. The result is a top-hat-shaped bushing that fit both the hand and the cannon pinion, Figure 8. The bushing was then reversed and mounted in a collet that allowed the top of the flange to be turned down to a nice finish.


Fig. 4


Fig. 5


Fig. 6

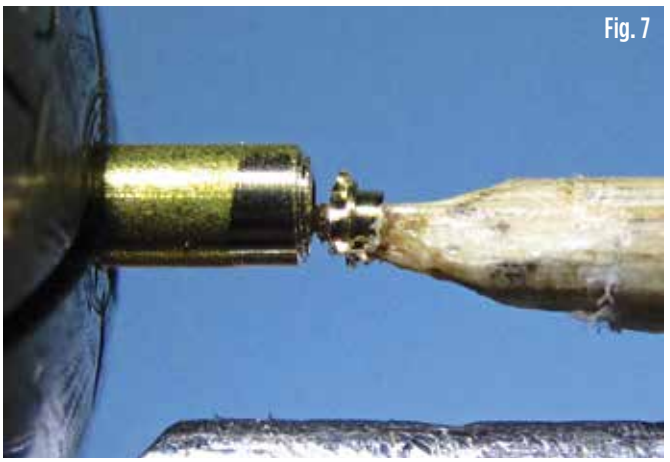

Fig. 7


Fig. 8

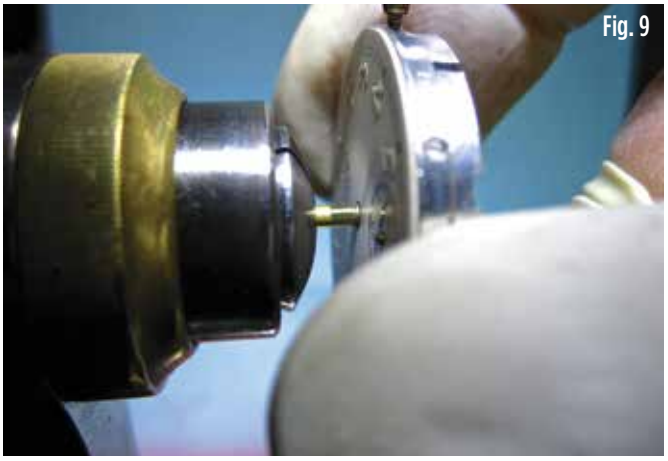
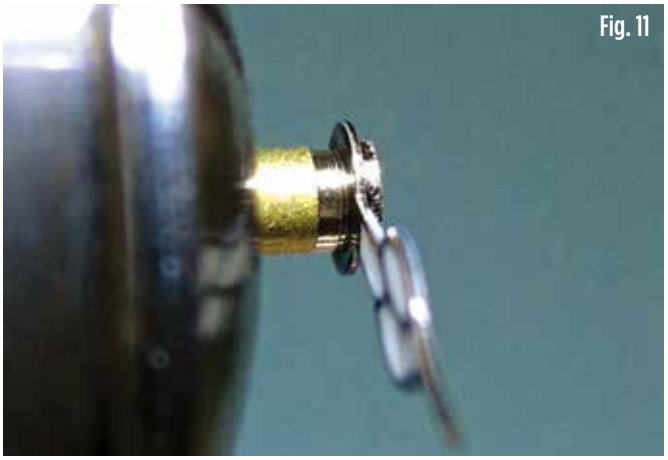
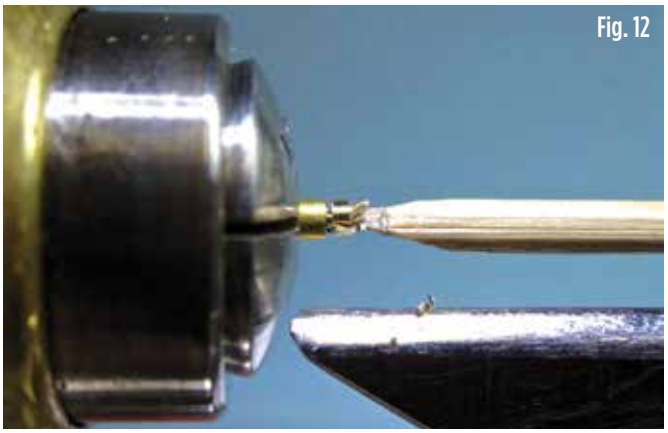

Fig. 9


Fig. 10


Fig. 11


Fig. 12

I have demonstrated how to create a bushing to fit a minute-hand with an oversized hole. Now, I will show how to make the hour-hand bushing and attach both of them to their respective hands.

Initially the brass rod was drilled deep enough to accommodate the making of both bushings. The hole for the hour-hand bushing was bored out and tested for a slight friction fit onto the hour wheel, Figure 9. The close view of Figure 10 shows the bushing nearly seated on the shoulder of the hour wheel. With slightly more pressure applied, the bushing would seat. With light pressure the bushing should seat two-thirds of the way down the hour wheel. This will create the proper fit when it is pressed all the way down. As with the minute hand, the brass rod was turned down to fit the hour hand with a tight fit, Figure 11. Due to the possibility of interference, a very slight flange was created. The bushing was parted from the stock and, as shown, was captured by a sharpened pegwood, Figure 12.

The hour-hand bushing was firmly pressed in place from the top with the flange up. The flange insures that the hour-hand pipe will not slide off the bushing when removing the hand. Riveting the thin bushing in place may have distorted the hand pipe. Consequently, I used red permanent thread locker in conjunction with a tight friction fit to provide a very strong bond. The finished hour-hand is shown next to the minute-hand and its bushing in Figure 13.


Fig. 13

Initially, the bushing was turned slightly longer than the hand post with the intention of it being riveted. The minute-hand bushing is shown in Figure 14 being pressed in place using a delrin rod (plastic) that will not mar the flange. Once the bushing was fully seated, Figure 15, the hand was turned over, placed on a staking tool, and the bushing was gently riveted in place using a round-nose stake, Figure 16. A nice, pressed in chamfer is shown in Figure 17. A flat-faced stake was then used in order to permanently affix the bushing. A bottom and top view of the minute-hand bushing is shown in Figures 18 and 19.

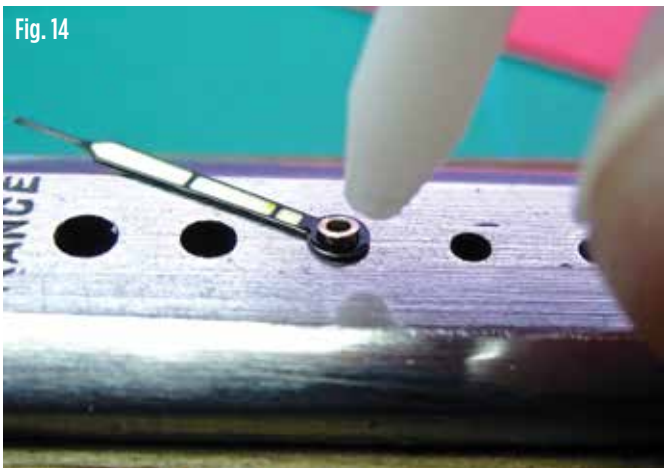
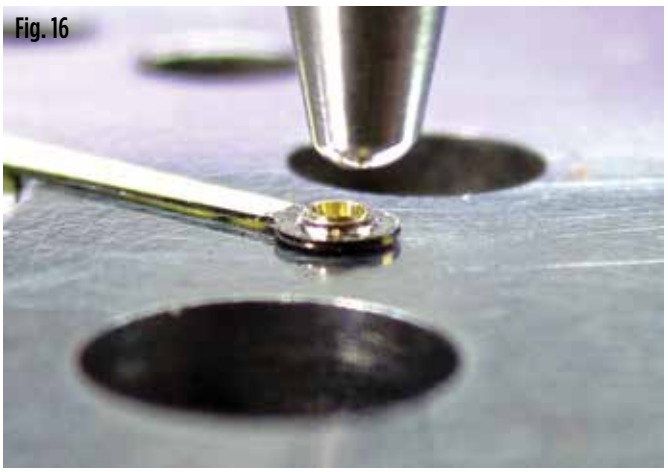

Fig. 14


Fig. 15


Fig. 16

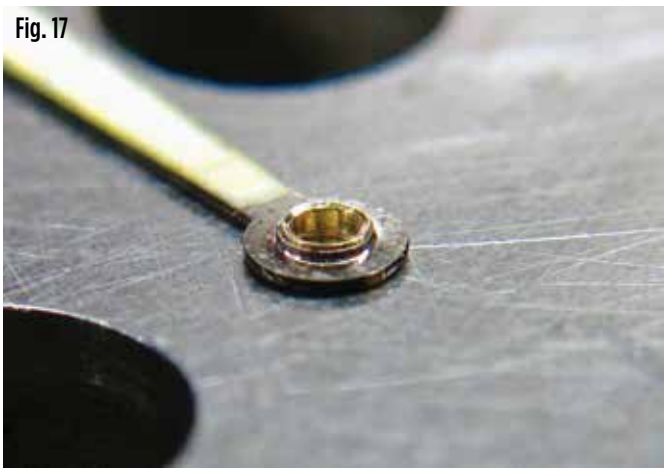

Fig. 17


Fig. 18


Fig. 19

The two bushings in the hands are shown in the close view Figure 22.

The hour hand and the bushing flange are shown pressed in place flush with the top of the hour wheel, Figure 21. This provides ample clearance for the hands at their terminal. One situation that arose in the beginning was that the new hands had brilliant white luminous material that did not match the color of the numerals on the refinished dial. I was able to tone down the white by painting the hands with yellow acrylic paint, letting it remain for a short time, and then wiping it off before it dried. In conclusion, the hands are shown mounted on the vintage 6/0 size Waltham watch, Figure 22.

Sourcing specific style or genuine vintage watch hands can be challenging. Current material houses may have modern-made hands like the "skeleton" style I used in this article. The National Association of Watch and Clock Collectors' (NAWCC) annual regional marts have been, and still are, a source for vintage and antique original or reproduction hands.


Fig. 20



Fig. 21



Fig. 22

Dale LaDue graduated from Gem City College School of Horology and The University of Illinois Micro Precision Technology Project with AWI Certification. He has served the Rochester, New York, area as an independent retail and trade watchmaker/clockmaker for 48 years.

The Solar Time Clock

By Donna Hardy

British clockmaker George deFossard, FBHI, has created a mechanical clock that can be set for longitude and latitude, allowing it to tell the time virtually anywhere in the world.



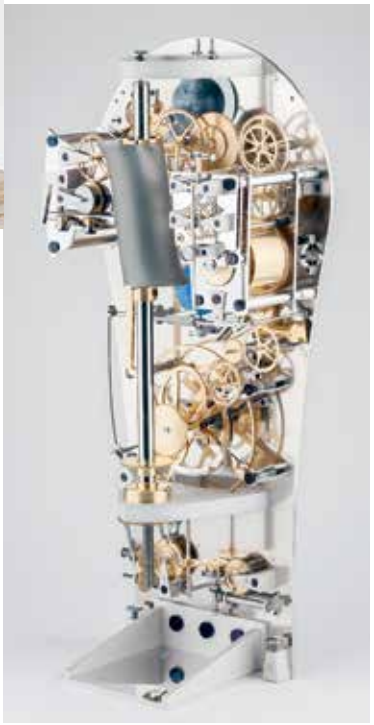
deFossard, who spent more than three years building the elaborate clock made of 750 handmade parts, started his career in mechanical engineering and design. He later retrained as a clockmaker, studying the conservation and restoration of antique clocks at West Dean College.

deFossard's wife, Cornelia, who studied the conservation and restoration of antique furniture at West Dean College, created the clock case, which is made of ebonized pear wood and brushed stainless steel metalwork.

The moon phase indication is driven by an exceptionally accurate, complex, and unusual compound worm mechanism, which was first designed by 18th-century English clockmaker Thomas Mudge. According to deFossard, Mudge's invention was condemned to history because of its complexity, rather than its mathematical accuracy. deFossard has resurrected it and combined it with his own mechanical invention to create a unique and modern timepiece.

The deFossards said they were inspired to make the clock "by the vibrant and innovative mechanical watch market."

There will be an official launch at The Clockmakers' Museum in London in the autumn, as part of the Worshipful Company of Clockmaker's collection, which includes clocks and watches by horological icons such as Tompion, Harrison, and Daniels. After its time in the museum, the Solar Time Clock will be put up for public sale.



Source:
www.defossard.co.uk/

Donna Hardy is the managing editor of the *Horological Times*.

Breitling Hires New CEO

By Aaron Recksiek, CW21

Breitling SA, located in Grenchen, Switzerland, has hired Georges Kern as their new Chief Executive Officer. The move comes just three months after Breitling's announcement of a sale to investment firm CVC Capitol Partners. Kern replaces longtime owner Théodore Schneider, who retained a 20% ownership stake in the brand.

Kern was previously the head of watchmaking, marketing, and digital at Richemont, a job he had been promoted to just last year. His tenure within the Richemont company started in 2002 where he served as CEO of IWC for 14 years. By taking this position, Kern also forfeited his standing to be elected to the Board of Directors of Compagnie Financière Richemont SA at the forthcoming annual general meeting of shareholders in September.

Breitling stated in a press release, "Georges Kern's mission will be to foster the global development of one of the world's most established watch manufacturers, and focus on further developing Breitling's digital and retail footprint, especially with a view of accelerating growth in the important Asian markets." This statement makes sense considering that, amidst sale in April, Théodore Schneider explained one of the decisions to sell 80% of the brand to CVC Capitol, "CVC's expertise, track record, and international network will help unlock Breitling's full potential." CVC has investments in many brands that have extensive distribution networks in Asia.

It's not a complete change of management, however; Breitling also announced they will be retaining Jean-Paul Girardin in his position as vice president.

Sources:

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Peter Speake-Marin Leaves His Own Brand

By Aaron Recksiek, CW21

Peter Speake-Marin, an English watchmaker, has left the watch brand that bears his name. For the last several years, Speake-Marin has been transitioning away from running the business operations of the brand. As this was happening, he was also selling his personal shares of the company little by little to his main investor, the Rosnoblet family. Recently, Speake-Marin has been producing more economical models using ETA automatic and even quartz movements. This is largely credited to the Rosnoblet family taking over majority ownership and attempting to make more "business-savvy" decisions.

The brand Speake-Marin was founded in 2002 after Peter Speake-Marin finished what he called the "Foundation Watch," a handmade tourbillon pocket watch that set the tone for the quality that was to be expected of the brand. The manufacture of this rare timepiece also contributed to Peter Speake-Marin

becoming a member of the AHCI: Académie Horlogère des Créateurs Indépendants.

After completing his initial horological training at Hackney Technical College in London in 1985, Speake-Marin went on to complete the complications course at the WOSTEP school in Neuchâtel, Switzerland. He subsequently went into restoration and eventually helped collaborate on high-end complications with Renaud & Papi, Harry Winston, MB&F, Christophe Claret, Roger Dubuis, Daniel Roth, and Maîtres du Temps.



Peter Speake-Marin is an English watchmaker based in Switzerland.

His decision to leave his company was made deliberately and has allowed Speake-Marin to focus on returning to one of his original passions, education. Much mystery surrounds the details of this project, but we know that it will include a website: www.thenakedwatchmaker.com. Presumably, there will be no nudity involved in this website, set to launch in mid-September. However, the lack of details has led to a lot of amusement about what it will actually be. Some details were later released, as well as several screenshots of the interior pages of the site. The website will start out as a horological encyclopedia. A quote from the "WHY?" section of the new website states: "The goal of this site is to bring to a new generation the magic and passion of watchmaking and to increase the knowledge of those already bitten by the horological bug." Speake-Marin was quoted in an interview with Quill & Pad explaining, "My goal is for this website to become the go-to for anybody who wants to buy a mechanical watch or wants to learn more about watches."

Photo by Speake-Marin

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www.thenakedwatchmaker.com/

Grand Opening of Veterans Watchmaker Initiative

By Aaron Recksiek, CW21

The Veterans Watchmaker Initiative (VWI), a watchmaking school designed to give honorably discharged disabled veterans a chance to learn a new skill and earn a living, is scheduled to begin classes on September 5 with a grand opening ribbon-cutting ceremony scheduled for September 13. Sam Cannan began this project five years ago to provide tuition-free education to veterans who otherwise have very limited options. The unemployment rate is 82% within this group of individuals. The school was inspired by the Joseph Bulova School of Watchmaking, which trained many disabled veterans to become watchmakers after World War II.

Sam Cannan is an AWCI member, Education & Standards Committee member, and former director of the National Association of Watch & Clock Collectors School of Horology. Cannan has been a watchmaker for over 20 years and is a graduate of the NAWCC School of Horology. VWI has also retained the services Rick Aubin, a former watchmaker from New York who retired to Delaware and will be volunteering his time as an instructor. Aubin is a veteran

himself with the Vermont Air National Guard. He trained at the Joseph Bulova School of Watchmaking in 1971.

The current Odessa, Delaware, facility is located within a former New Castle County paramedic station, and the space is being leased to the school for one dollar per year. The facility is a temporary location until the permanent school is built a few miles away in Middletown. Four acres were donated to VWI in November 2014 for construction of the planned 28,000 sq. ft. facility. The estimated maximum capacity of the planned school is 54 students. Groundbreaking on the permanent facility will begin once enough money has been raised to cover the cost of construction. The Odessa facility will then be converted into a service center where graduates of the school can transition to working in a low-pressure environment outside of the public arena.

The first class will consist of six students who will complete a six-week (260-hour) watch technician course. The school's website states that "Upon successful completion of the [Watch Technician] program the student will be able to complete standard repairs on all types of quartz watches and allow the graduate to enter the job market as a quartz watch technician." The school states that more than 300 veterans have applied for the program.



Co-founder of the Veterans Watchmaker Initiative, Sam Cannan, at AWCI's convention last year.

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Aaron Recksiek is an independent watchmaker in Salt Lake City, Utah. He is a graduate of the 2008 WOSTEP class at the Lititz Watch Technicum.

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Complete Price Guide to Watches, 37th Edition

Tom Engle, Richard Gilbert, Cooksey Shugart.
Tinderbox Press, 2017. $29.95

Reviewed by Daniel Benson, CMW

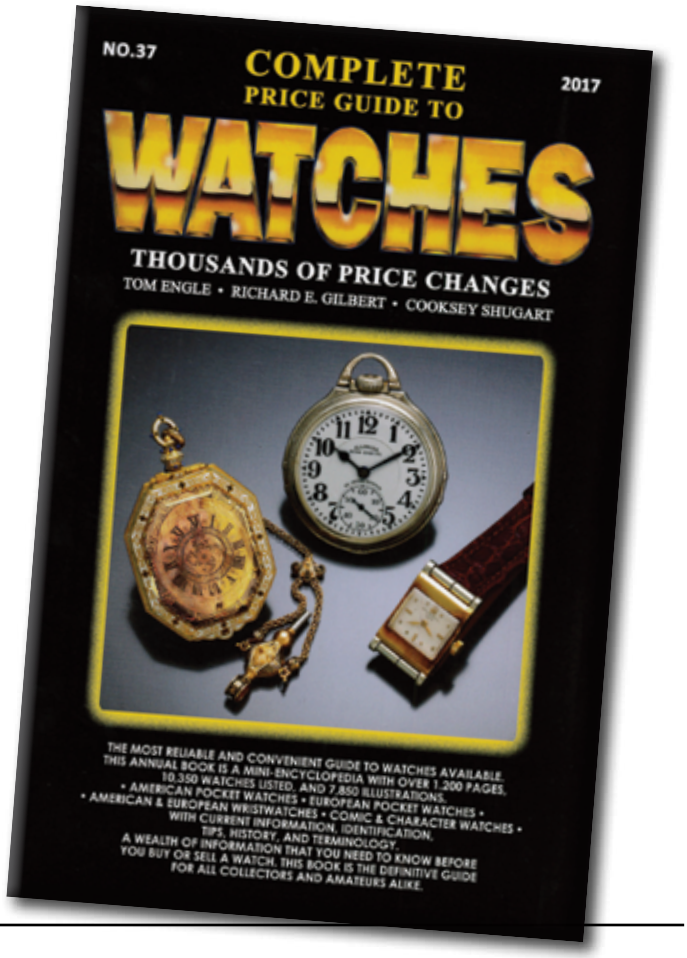
Published annually since 1980, *The Complete Price Guide to Watches* is a hefty tome of encyclopedic comprehensiveness. With more than 1,200 pages, thousands of illustrations, and innumerable in-depth articles, it is an important resource for anyone who repairs, sells, or collects antique, vintage, or collectable watches.

The heart of the book–more than 1,000 pages of the total–is a catalog of more than 10,000 different pocket watches and wristwatches organized by manufacturer. Most are illustrated, and all have some descriptive details, indication of rarity, and suggested prices for selling or buying based on the watch's condition. While the authors cover both American and European timepieces, they go into much more depth with the domestic product, especially for pocket watches. Large sections are devoted to Waltham, Hamilton, Elgin, and Illinois, as well as lesser American firms.

The chapter on wristwatches is dominated by Swiss marks. However, American firms such as Hamilton, Bulova, Gruen, and Elgin are well represented (Hamilton's electric and Bulova's Accutron are particularly highlighted). Popular up-market Swiss brands such as Omega, Longines, Patek, Movado, and Rolex are thoroughly covered. Many minor brands are included (even if only to acknowledge their existence) with a few models, adding to the comprehensiveness of the whole catalog.

Most manufacturers are introduced by a brief history of the firm. For some firms (especially the American ones), this historical information can be quite extensive, including serial number lists, production codes, ownership and name changes, technical developments, advertisements, etc. The specific models listed under each brand do not appear to be organized according to any scheme; old and new, men's and women's, simple and complicated types are all mixed together, which can make finding a particular model challenging.

The rest of the book is a collection of articles and illustrations covering an incredibly wide range of topics on watches: collecting, evaluating, railroad standards, positional adjustments, how watches work, various escapements, history of watchmaking,



case manufacturing, identification systems, hallmarks, and much more. Most of this is laid out in the first 100 pages, but stand-alone articles are scattered through the whole book. The last sections are dedicated to an illustrated glossary, a discussion of various unusual escapements, and a brief biography of George Daniels.

I'm not a collector per se, but I do have a good assortment of vintage watches acquired over the years, so I gathered 25 of them to put *The Guide* to work. I found three perfect matches and eight close-enough matches, but for the remainder I couldn't find anything that resembled what I was looking for. I expected the success rate to be a bit better, assuming that my watches are not rare nor expensive (perhaps they are not sufficiently collectable to be included), but I was somewhat disappointed in the result. A helpful addition would be guidance on how to make comparisons or cross-references when a particular watch is not included in the catalog.

Errors and oversights tarnish what is otherwise an impressive work.

As for prices (which is, after all, the major point of *The Guide*), the authors claim "thousands of price changes" with each edition. I confess that I did not attempt to verify this fact. I did compare prices for a number of watches between *The Guide* and eBay and found generally the selling prices on eBay to be higher. Admittedly, my sample was quite small to be conclusive, but it would suggest that a buyer or seller would be wise to consider multiple sources along with *The Guide* in setting a price for a particular watch.

My previous copy of *The Guide* is the 22nd edition, which was published in 2002. Given the 15-year gap, I hoped to see more substantial differences between the two volumes. Much of the content is the same with little revision or expansion, with just 50 additional watches, 50 more illustrations, and about 78 more pages in the 2017 edition. The additional pages appear to be the result of some additional historical commentary, which is very welcome. Naturally, much of the content would not change because the greater portion of the book is the catalog of vintage watches, but one could reasonably expect more changes and additions over a decade and a half.

Perhaps the most obvious indication the book has not been seriously updated is the lack of any meaningful references to online sales channels such as eBay or Amazon, and online resources about watches in general. Surely in 2017, the average watch collector is using online tools to sell, buy, evaluate, and learn about watches. The authors seem to be missing an opportunity to support and guide their readers in the digital marketplace.

Another indication the material needs updating is the short chapter on George Daniels. It offers a brief biographical sketch, lists his many accomplishments, and outlines the development and function of the co-axial escapement. It also describes Daniels as the "greatest living watchmaker" (page 1179). Given that Mr. Daniels died in 2011, this editorial oversight is, I feel, quite egregious and long overdue for correction.

When authors claim their book to be a "definitive guide," one hopes that they take great care with the content. In numerous places the authors invite corrections and feedback to help make the book as accurate and comprehensive as possible. So, I was surprised that some errors have endured across some 15 editions. For example, in explaining the

regulation of a watch, the authors state that moving the regulator to S allows "the hairspring to lengthen and the balance wheel to make a longer arc of rotation… causing the watch to run slower because it requires a longer time to perform the longer arc" (page 19). This is clearly a misunderstanding of how oscillators work: altering the hairspring length increases or decreases the natural frequency of the balance-hairspring oscillator, and hence the rate of the watch. What the authors are describing, in fact, is an isochronal error, which is normally not materially affected by moving the regulator, nor useful in bringing a watch to mean time.

In another place, the authors discuss the arc of motion of a balance without any reference to isochronal error. They do claim, however, that the proper balance amplitude should be "between 180° and 315° in a single direction… 220° is said to be perfect" (page 79). Again, there seems to be some confusion, as 180° is generally considered quite an inadequate amplitude; 315° is dangerously close to over motion; and 220° is only "perfect" in the sense that it is the amplitude at which poise errors are neutralized (but would otherwise be considered a fairly insufficient arc of motion).

Minor errors make their way into the text as well. Perhaps through some glitch in typesetting or formatting, numerous dates were changed in the historical section. Thus, we see that 1505 was a very busy year horologically: the hairspring was invented (page 61), double hour hands became common on railroad watches (page 21), and collectable watches sold for about the same price as a new car (page 8). Silly errors like these creep in almost gremlin-like if editors are not attentive.

These are the sorts of errors and oversights that tarnish what is otherwise an impressive work. Clearly, over the years the authors have worked hard to develop and maintain this encyclopedic reference. The comprehensive information, especially on American watches, makes *The Guide* a very useful resource for anyone interested in watches in a general way, collecting, or repairing. As a repairer, I find my customers are often interested in knowing more about the history of their vintage or antique watch and the firm that made it. The authors offer a wealth of good information to help in that conversation. However, on critical points I'd be inclined to do a bit of fact checking from another source, given some of the shortcomings identified above.

If dollar valuations are particularly important to you as a buyer or seller of watches, you may want to invest in a current or recent edition. Otherwise, an older edition may be just as good for your purposes. Regardless, at only $30, there is good value in keeping a copy of *The Complete Price Guide to Watches* in your horological library.

The Complete Price Guide to Watches is available directly from the publisher at www.tinderboxpress.com or through your favorite bookseller or supply house. Used copies can be found online or in used bookstores. AWCI's library also has a copy.

Daniel Benson is a graduate of watchmaking at George Brown College, Toronto, and a first-place graduate of WOSTEP in Neuchâtel, Switzerland. As well as having a career in horology, Daniel has worked extensively in book publishing and communications.

Ask David Christianson

CMW21, FBHI, FAWCI

Question

I have an unusual clock in the shop right now that I am interested in knowing a bit more about. It has a "silk thread" suspension, rack strike, and deadbeat escapement. The bell that attaches to the rear of the movement has been removed for the photo. The hammer is also not yet mounted. I associate silk thread suspensions with France, but the false plate has the name Franz Lengsfeld on it. This name sounds German to me. Is this a French clock, a German clock, or perhaps a German case with a French movement?





The case is brass with what appears to be some "enameling."

In the pictures, you can see that the center of the dial has an engraving of Father Time or perhaps "death" himself. Does Father Time carry a sickle?





One of the top corners shows the sun rising with a rooster, and the other shows a moon and an owl. I assume that this is signifying morning and evening, and perhaps all the pictures together point to "the death of a day" or the passing of time?

There is some lettering at the bottom (see photo below). Perhaps this word or words are an additional clue to the theme of the clock. Are the words French, German, or maybe Latin? I tried using Google translator and it says it might be Scots Gaelic, but it doesn't try to translate it. There are several ways to interpret the letters. I come up with something like L_ _obuonr, irdomair. I am not sure what the second and third letters are.



Does anyone know the time period for when silk thread suspensions were used?

Sincerely,

Michael Gainey, CC21
Master Clock Repair
American Watchmakers-Clockmakers Institute

Answer

Michael,

The name "death clock" today normally refers to an advanced life-expectancy calculator. In the 19th century, it referred to an ormolu-decorated clock. Ormolu is an 18th-century English term for applying finely ground, high-karat gold in a nitrate of mercury amalgam to a bronze object. The mercury was then burned off with extreme heat, such as in a kiln, and the gold remained attached to the bronze case. Due to exposure to the harmful mercury fumes, most gilders did not survive beyond 40 years of age. Consequently, the ormolu clock was dubbed the "death clock." The process was primarily used in England and France, but, fortunately, the use of mercury in fire gilding was outlawed around 1830.

Your clock would be more appropriately called a "memento mori" with a skull or Father Time or an engraved motto reminding the user that every moment is precious and with every tick of the clock we are brought closer to death. This was common in the 15th and 16th centuries, but over time and as commerce developed and expanded, timepieces became less of a reminder of death and more of an instrument for the living and for doing the various activities of life.

The silk suspension was used in the first pendulum clock designed by Christiaan Huygens (1629-95) and built by Salomon Coster (d. 1659) and dated 1657. The suspension used in your clock was commonly used primarily in France and Switzerland in the late 1700s and early 1800s until it was replaced by the flat suspension spring around 1840-50.

Father Time is usually depicted as an elderly, bearded man with wings, dressed in a robe, and carrying a scythe (or sickle). He has an hourglass or other timekeeping device with him. He represents

time's constant one-way movement and is derived from several sources, including the Grim Reaper, Cronus (not Chronos) the Greek Titan of human time, reaping, and calendars. He is also known as the Lord of Time.

The images of Father Time with the rising sun, rooster, moon, and owl certainly depict a "memento mori," a reminder of our mortality, a theme that was more popular a hundred years earlier. At the same time, it points to, as you surmised, "the death of a day" and the passing of time, a theme that was more likely popular when this clock was made.

Clockmaker Jerry Faier noted that "the case is clearly champlevé enameling. That's like cloisonné but instead of using the wires as a border for the enameling, they carved out the brass plate with the design that they then flowed the enamel into. Few French movements that I have encountered have back winding movements—the Viennese, the Germans, and even the Swiss did but rarely the French."

Clockmaker Bob Ockenden added that "my initial impression is Austrian: no taper to the winding arbors; the ratchet wheels look Austrian to me; the fine, quality finish; and, my guess, high tooth count? The hands are serpentine, which, again, makes me suspect Austrian make."

Clockmaker David LaBounty concurred with both Jerry and Bob "that this is a Viennese clock and depicts Father Time. Franz Lengsfeld is listed as a Viennese clockmaker/watchmaker, ca. 1857-1899, in Frederick Kaltenbock's *Viennese Timepieces*, 1993, page 247.

As to the symbols on the lower portion of the case—no one seems to have a clue!

Sincerely presented,

David Christianson, CMW21, FAWCI, FBHI

David Christianson is a graduate of Purdue University, the Kansas City School of Watchmaking, the Gemological Institute of America, and is an internationally known horological historian.

Watchmakers & Clockmakers

Have you worked on an unusual or historic timepiece that fascinated you and you wanted to know more about it?

Where was it made?

How old is it?

Have customers asked you questions about the history of their timepiece that you were unable to answer?

David Christianson, CMW21, FBHI, FAWI can help you answer those questions.



Send your question along with clear, high-resolution photos to Member Services

memserv@awci.com

or mail them to

Member Coordinator
701 Enterprise Drive
Harrison, OH 45030

Watchmaking Excellence: CW21 Standards

CASE BACKS

An excellent watchmaker should be able to open and close a watch back without leaving any marks. Very faint scratches may be acceptable in the bottom of a case notch if it has a sand-blasted or satin finish, but steps should be taken to prevent those marks. There cannot be any visible marks or scratches on the top surface of the case back. Every necessary precaution should be taken to prevent damage, including using proper tools and using protective film between the tool and the watch. Case knives should be sharp and smooth. Wrenches should fit snugly in the notches and match the profile of the notch.


Notch with no damage.


Press-type back with no damage.

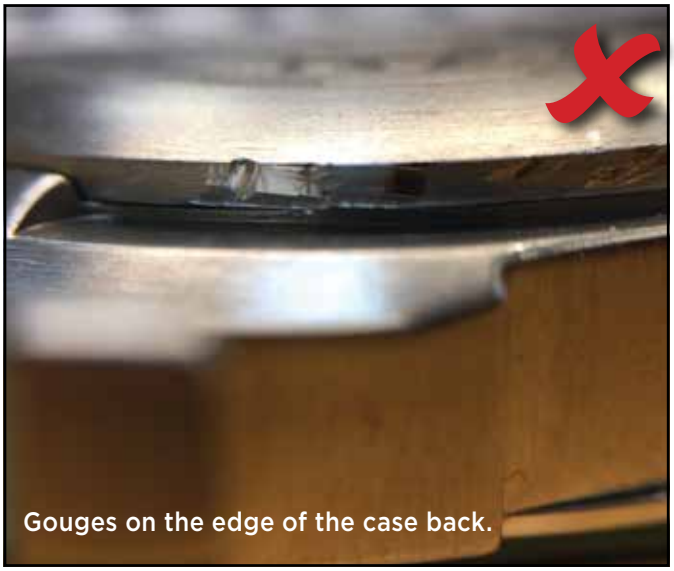

Snap back with no damage.



Scratches on case frame and back from a case knife that slipped.



Large scratch on back from case knife slipping.



Gouges on the edge of the case back.



Deep scratch on case back from case knife.



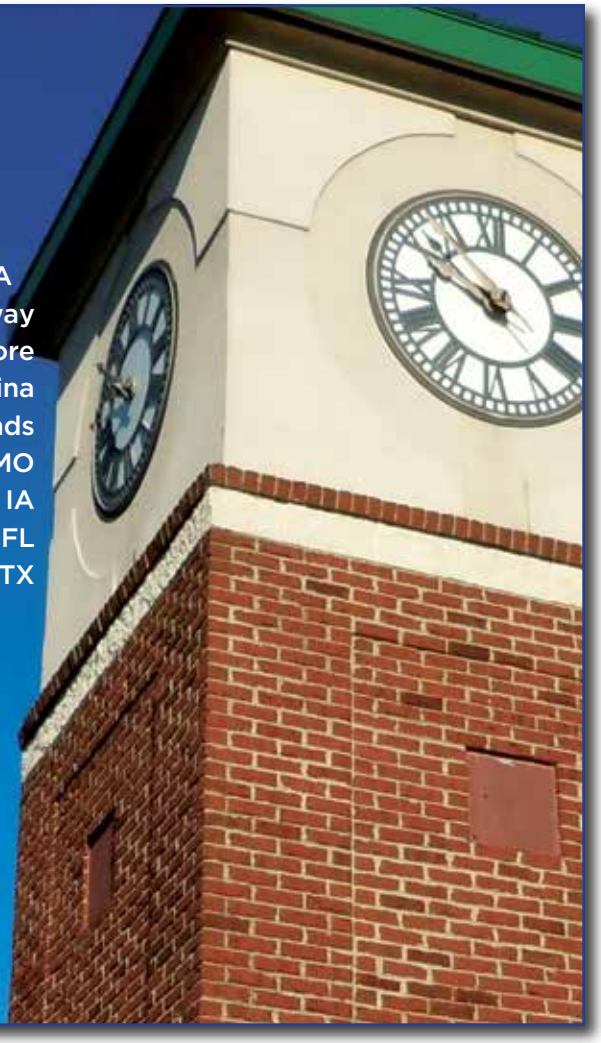
Deep scratches in notch and large gouge on case back.



Deep scratch from case wrench.

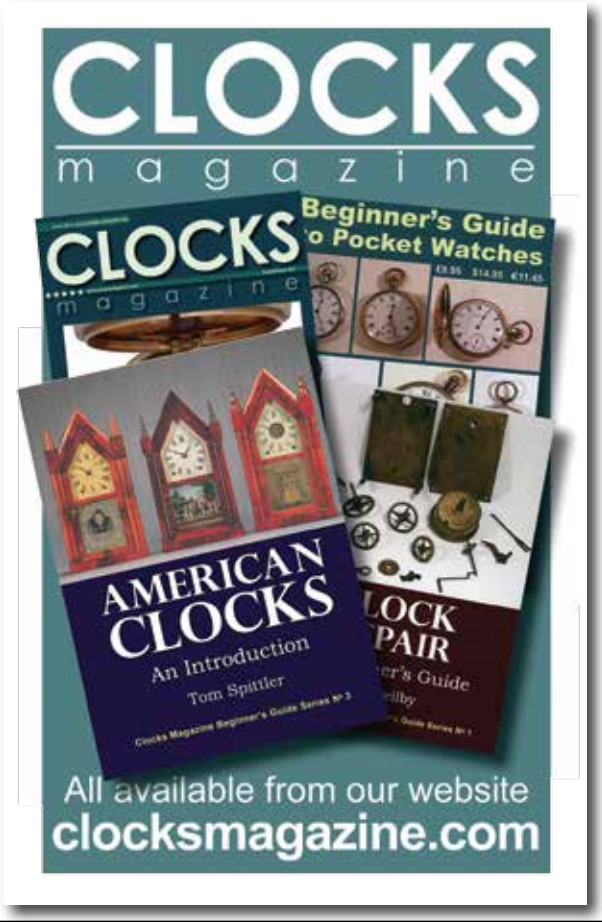
AWCI Welcomes New Members

Ivy Booth	MN	Henry Lieu	CA
Jose De La Rosa	AZ	Gregor Lovlie	Norway
Eric Evrley	FL	Daye Ou	Singapore
Cameron D. Geweniger	IL	Andres E. Romero	Argentina
Alberto E. Gutierrez Sr.	AZ	Kalle Slaap	Netherlands
Christopher James	OH	Israel Slick	MO
Catherine Keith	IL	George D. Sutton	IA
Sara Kempton	IL	James M. Tompkins	FL
Richard Knetsch	TX	Karen Wood	TX



In Memoriam

Harry C. Creed	CA	Richard A. Mazza	CA
Gerald D. Kincaid	MD	Ronald R. Tidball	CO





"Columbia is home to one of the world's only horology museums."

—Smithsonian Magazine

The Smithsonian Magazine ranked Columbia, PA, among the top 20 best small towns to visit in the United States, in part, because of its strength in history.

The National Watch & Clock Museum in Columbia includes 19th-century American clocks and watches and timekeepers from around the world.

National Association of WATCH & CLOCK Collectors, Inc. **UPCOMING CLASSES**

Evaluating Time: Research, Identify, and Value Wrist and Pocket Watches
September 16-18, 2017

Luxury or Lie: How to Identify Genuine Watches
October 28-30, 2017

New One-Day Novice Course
October 27, 2017

Contact the Education Department at 717.684.8261, ext. 237 or education@nawcc.org.
Check out www.museumoftime.org for more info.

Tom's Tips

By Tom Schomaker, CMW21

Latex Dial Protectors: The Two-Dollar Insurance Policy

These simple latex discs have to be one of the most useful tools in today's watch repair scenario. There are countless ways to use them. Two dollars each for a thin piece of round, synthetic material may seem expensive to some, but they are far from a one-time usage item. This month's "Watchmaking Excellence" (page 42) focused on opening the case back while preventing any damage. These discs are perfectly designed for just such a task and more.

Allow me to outline the typical way they can be used effectively and efficiently. Here are some of the more common uses:

1. Hand removal–While still clean and undamaged, these discs allow for removal of the hands without the risk of losing them. They also protect the dial from any damage caused by the Presto tool or hand levers. Their usage here also provides a secondary benefit. It allows you to feel the actual amount of pressure that you're applying to the hands to remove them. This can often prevent the damage around the hub of tightly fitted hands by being able to gauge the amount of force you're using.

2. Opening the case back–These discs work great to protect the case back notches from damage to the bottom and sides. The bottom of the case back notches are often textured or have some sort of finish to them. Any contact between the steel tips of the tool and the case back notches with these types of finishes will leave a noticeable mark that can easily be prevented.

3. Snap-off back designs benefit from these protectors as well. Not only do they prevent "lip damage," the protective latex disc acts as a non-skid surface to prevent unwanted and dangerous slipping. This can give us some assurance against scratching a sentimental watch with an engraved case back.

4. Closing the cases with a press–Many crystal dies are made of aluminum and other material, including plastic-like materials that can still scratch or mar a freshly polished case. These discs can provide a safety barrier between the case back and the die. They are still thin enough not to have a negative effect on the actual operation or die selection, but tough enough to protect and even stretch as needed during the closing operation.

5. Inserting a crystal–Especially the ones with an anti-reflective coating. These crystals are often found on higher-quality watches and sports watches. These coatings can be on the outside only, inside only, or even both. Left unprotected, it is quite easy to damage the AR coating when you are trying to push in or out

an extra-thick crystal that requires quite a bit of force or leverage. These crystals can cost up to $150. Insurance.

Typically, the discs will eventually have enough damage to them that they may no longer be useful for more delicate tasks such as hand removal, for example. They can then be relegated to other tasks that may not be as critical, such as case opening or the case press. The repurposing of a single disc may result in weeks of meaningful usage before being retired.

Some of the properties that make them different from other commonly used items, such as watchmaker's tissue, are:

a. The semiclear consistency allows you to precisely fit dies to the critical edges.

b. Seeing the positioning of the hands before and during their removal.

c. There can be a stretch that allows you to judge the amount of force being applied.

d. This "feeling" is not obtainable with many other substituted products.

e. Provides a scratch- and slip-resistant thin barrier.

Here are a few more examples of tasks that can be more safely accomplished while using these handy protectors:

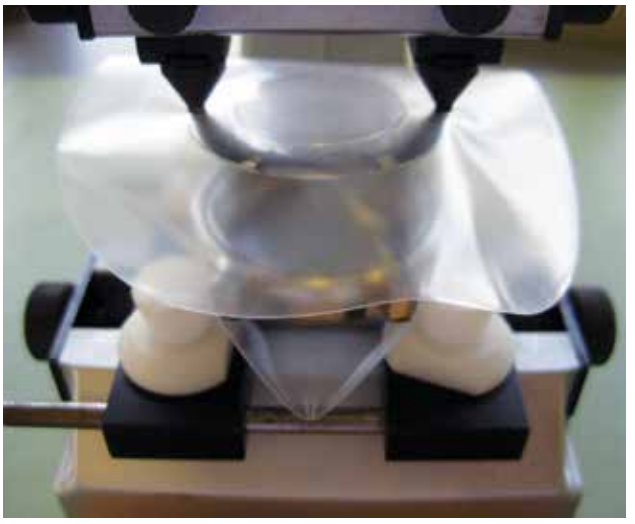
- Bracelet link removal and installation
- Protective barrier between the staking stump and oscillating weight axle's shiny surface during installation
- Preventing marring of the side of the case while in a case holder
- Aids in bezel removal
- Casing up a freshly serviced movement
- Used in conjunction with an alcohol cup to prevent evaporation of certain chemicals. (Many chemicals I tested had no adverse effect on these discs.)
- Creating a storage membrane for a delicate part
- Protect the dial when being clamped into a movement holder
- A temporary dust cover

The list of uses can go on and on. So, you may want to consider trying some of these handy little tools. They are not only useful, but they can certainly provide a level of reassurance or insurance when dealing with all kinds of tasks.

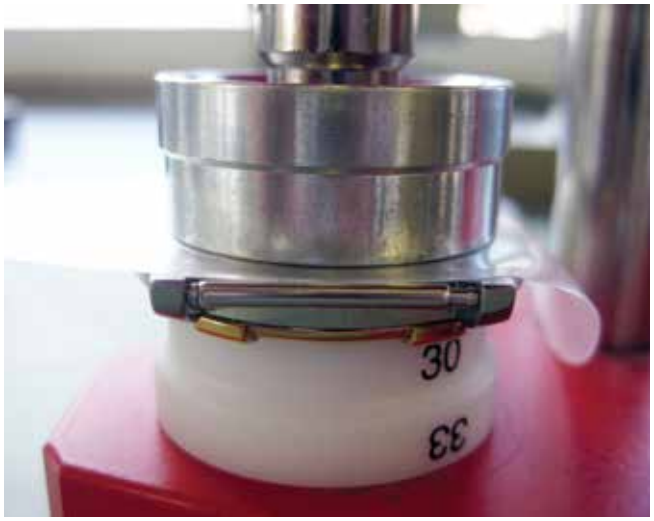
These latex discs are now available from Bergeon and come in two sizes. The part numbers are: 7982-60-20 (for a 60mm size in a quantity of 20) or the 7982-85-100 (for the larger diameter of 85mm in a quantity of 100).

Oh, did I mention…they cost around two dollars each.

Installing or removing screw-on case back.



Installing friction fit case back.



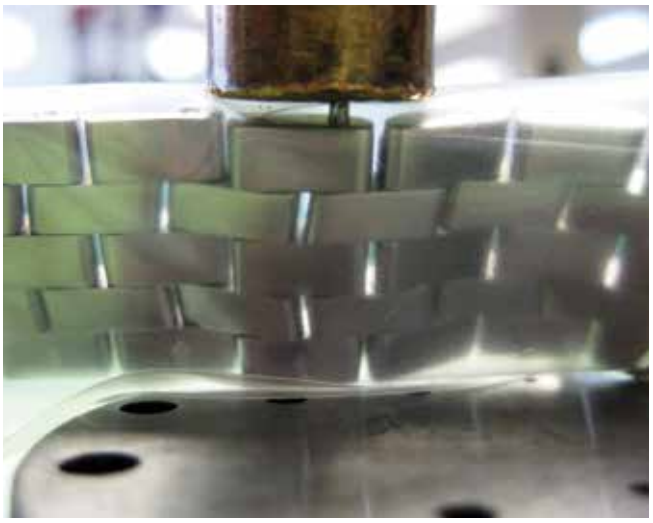
Casing up a recently serviced movement.



Protecting the dial while removing hands.



Bracelet link installation.



Bracelet link removal.



Two sizes of latex dial protectors.



Tom Schomaker is the watchmaking instructor at AWCI.

From the Workshop

By Jack Kurdzionak, CW21, FAWCI

Divide, then Conquer

What follows is not a repair guide. I wrote it with the point of view of sorting out problems found in watches that have had numerous repair interventions while they were used for training. I am not trying to reinvent the wheel by writing about how to assemble a 7750, but I am attempting to get watchmakers to think about assembling and testing each component as they build a movement. Many can assemble a movement, far fewer can solve problems. My goal is to have more solve problems.

Recently I needed to service several watch movements that had been used as part of an instructional program. The movements were all the same, ETA 7750 chronographs and completely disassembled when received. They were delivered to me in trays, one movement per tray. Some parts were damaged, some were missing, and my task was to get them all together in proper operating condition within the original factory specifications. In some ways, this is like repairing vintage watches that have been repaired numerous times in the past, because any vintage watch may have worn parts, damaged parts, or incorrect parts. While these chronographs did not have worn parts, they did have damaged parts and parts that had been modified during the training session. I had to approach these repairs with a different mental strategy than I usually would take repairing a late-model movement that has been used for a few years and now needs repair.

To begin, I cleaned all the loose parts before assembling the movement. My first step was to oil the balance jewels, fit them, and check the balance and the hairspring, making any needed corrections for endshake and hairspring truing. Next, the keyless work (winding and setting parts) were installed and their proper functioning confirmed to make certain all was fine. The time train and barrel with mainspring went in next and all were checked for damaged teeth. All train endshakes were checked and confirmed as OK. A few turns of the winding stem demonstrated the train was turning freely, and all wheels were true in the flat. The pallet was examined for any damage before being installed, and then tested for endshake and freedom after fitting the pallet bridge.

I wound the stem a few turns to test the escapement for drop, lock, and slide. If that was all right, I oiled the pallet stones with Moebius 9415 and wound the mainspring fully before checking for adequate amplitude. A clean, well-adjusted ETA 7750 will run quite well for a few minutes with only the balance and pallet jewels oiled. If there was any problem found in the time train, I resolved it at this stage of the repair. If everything was all right with the time train, I oiled all the wheels and did the initial timekeeping test to be certain it ran well before proceeding any further. There is no sense building the entire movement only to discover a time train problem that could have been easily resolved early in the repair process.

Once the driver cannon pinion (ref. 240) is installed, it needs to be tested for proper hand-setting friction. If there is a problem here, resolve first before moving on. If this step is ignored and later a problem is discovered, it will waste considerable time solving it later in the repair process.

With the time train and keyless work in good order, the next step for me is fitting the automatic winding parts simultaneously with the chronograph parts. These parts are integrated into the two upper bridges of this movement and cannot be assembled

as separate modular components. Here is where I had to pay careful attention to the physical condition of each part to be certain none were damaged. As these components were assembled, I checked their respective endshakes and confirmed the minute and second recorder arbors were straight. Some of these components had to be oiled during assembly because some of the lubrication points are not accessible after the automatic and chronograph bridges are set in place.

I use a Horia movement support specifically designed for the ETA 7750 (Horia ref. PP 7750-53), which incidentally works perfectly when assembling the very similar Sellita SW500 chronograph movement.

Now that the chronograph/automatic module is fitted to the movement, it is time to check all the chronograph functions and confirm they are all right. If they need adjustments, it is done now. Check the oscillating pinion for correct depth with the second recorder. Confirm that the finger of the second recorder indexes the minute recorder properly. Adjust the finger appropriately so that proper indexing is assured. Finally, the minute recorder jumper position must be tested, so the minute recorder does not move perceptibly when the chronograph hammers are pulled back from the recorder wheels. Using the Horia support, test the chronograph functions several times for start, stop, and fly back. This is when I check the amplitude of the movement running, with the chronograph on, to be certain no error was introduced by installing the chronograph parts. Assuming all is well here, the automatic winding functions are checked next.

The ball bearing is fitted and tested. Any looseness of the ball bearing race, or binding in the ball bearing assembly, indicates the need of replacement. If it is all right, the automatic winding function can be tested now. Assuming all is OK on the upper side of the movement, remove the oscillating weight and turn the movement over to begin assembling the dial-side components. (The oscillating weight will interfere with the screws in the movement holder that support several wheel arbors.)

The day drive wheel finger (part ref. 2556) must be carefully aligned with the guide line on the main plate, and the date drive wheel finger (part ref. 2556) must align with the post of the day driver. Good positioning here assures simultaneous day and date change. After fitting the calendar bridge, the day and date discs, and the dial, the day and date change functions can be tested. If all is OK, then the movement is ready for the dial and hands. The Horia tool has posts to support the arbors of the second recorder wheel, the minute recorder wheel, and the fourth wheel. Adjust the screws of the support tool to support each arbor when fitting the hands, thus preventing damage to the upper jewel of each wheel.

The above assembly sequence divides the procedure into small segments that permit isolating each module of the movement for testing and repair during assembly. It is always more efficient to resolve any problems if they are discovered during the assembly process rather than assemble the entire movement only to find a problem that requires complete disassembly of the movement to resolve. By this method, we divide the task of assembling the movement by adding discrete functional modules, preferably one at a time, so that each module can be tested for function as it is installed.

Remember that every watch movement consists of several modules, each of which performs a function and must work in conjunction with all the other components in the movement. By dividing the movement assembly task into segments, each of which can be tested as the movement is assembled, the watchmaker will conquer each repair successfully.

Two Friends of AWCI and "From the Workshop" Have Retired

For many years, this column has often called upon two special colleagues for technical information and industry news. Urs Hani with Witschi, and Gerard Meulensteen with Bergeon always made themselves available to this writer whenever called upon to provide up-to-date and accurate information about their companies' products. They were always willing to share their deep knowledge of Swiss watchmaking.

Urs is a Swiss-trained watchmaker who worked in the early development of Swiss quartz watches in the 1970s and 1980s. He brought his years of experience as a watchmaker and a researcher in the engineering department of one of Swatch Group's predecessor companies to Witschi, where he worked for over 15 years in technical sales. Fluent in several languages, including English, he assisted many of our members as they selected the most appropriate Witschi equipment to meet their individual needs. Urs is truly a watchmaker at heart. As soon as his retirement became effective on December 31, 2016, he opened a small watch repair business. He told me that before he accepted any commercial work he wanted to regain his proficiency at the bench. He did that by repairing his personal collection of watches. Once he was up to speed, he began accepting work. As of our most recent conversation, in addition to assisting a few retail store owners, he is doing some after-sales service for a well-known Swiss brand, repairing their vintage watches made during the 1950-1990 era.

Gerard, although not a watchmaker, knows as much about watchmaking tools and equipment as anyone I have ever met here or in Switzerland. He was always ready to assist any watchmaker purchasing a Bergeon product make an intelligent selection from their vast array of tools and equipment. Besides his native Dutch, Gerard is also fluent in several languages and extremely well spoken in English. In addition to his fluency in English, Gerard understands American English exceptionally well due to having spent several years in Connecticut working for an American company before moving to Bergeon in Switzerland. After 20 years with Bergeon, Gerard retired as of June 30, 2017. Both Urs and Gerard are well known to our AWCI members who attend our annual conventions as they both have been to several conventions representing their respective companies.



Gerard Meulensteen (left) with Tom Schomaker (right) at AWCI's annual convention last year.



Urs Hani at Baselworld.

Jack Kurdzionak, watchmaker and watch material specialist, owned a Boston-area watch sales and service shop for 40 years. He has a BS (Northeastern University, 1967) and has studied at ETA, WOSTEP, BHI, SGUS, and AWCI, and works for Eckcells Watch Materials.

Minnesota Clockmakers Guild (MCG)

2017 Joint MCG/MWCA Symposium

On May 6-7, 2017, the 91st annual Joint MCG/MWCA Symposium convened at the Mendota VFW in Mendota, Minnesota. There were several speakers. On Saturday Noel Totten, insurance/bond agent, talked about the needs of small business owners. Totten explained insurance needs for jewelers (clock repair) and the Jewelers Block requirements.

Jerry Faier had two presentations. In the morning, he lectured about "Physiology, Horology, and the Zen of Watch and Clock Work." In the afternoon, Jerry spoke about the "Future of Certification at AWCI."

Gary Anderson talked about private label pocket watches and shared two with consecutive serial numbers.

A silent auction was held after the convention. The auction was loaded with over 700 lots of materials, watches, and clocks, giving everyone a good chance to buy needed items. The auction consisted of four estates, one with three generations of watch and clock equipment, clocks, and watches.

On Sunday Bob Ockenden taught a platform escapements course covering the nuances of repair. It was a full-day program combining both theory and practical hands-on application. There were escapements and a few test platforms and movements to use for practice in mounting the escapement.



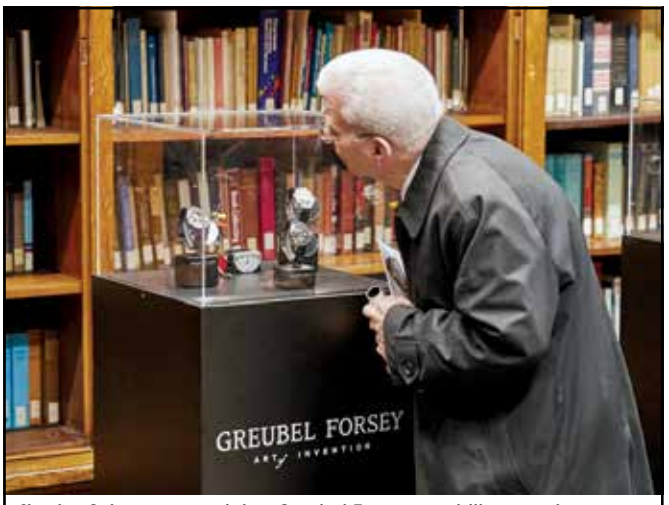
Silent auction held after the Joint MCG/MWCA Symposium in May 2017.

Horological Society of New York (HSNY)

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The History of the Tourbillon

Stephen Forsey, co-founder of Greubel Forsey and CompliTime SA, lectured at the June 5 meeting of HSNY about the history and functionality of tourbillon watches. Invented in the late 18th century by Abraham-Louis Breguet, the tourbillon has evolved with many enhancements to rate accuracy and reliability. Forsey pointed out several inventions and improvements made by Greubel Forsey, including their 30° inclined tourbillon. He also explained the scientific methodology that goes into testing tourbillons. Forsey brought a display of Greubel Forsey timepieces, allowing members a chance to examine expertly crafted tourbillon mechanisms up close.



Charles Salomon examining Greubel Forsey tourbillon watches.

Editor's Note: For individual affiliate chapter contact information, see the affiliate chapter ad on next page.

Ed Hydeman Named Executive Director for HSNY

HSNY Trustees elected Ed Hydeman as the organization's first executive director. HSNY created the position because its growth over recent years exposed a need for someone to manage the daily behind-the-scenes aspects of the society. Hydeman has experience in the watch industry and served as HSNY's president for eight years.



Stephen Forsey lecturing to HSNY members about tourbillon watches, their historical context, and the models manufactured by Greubel Forsey.



Ed Hydeman, left, became HSNY's first executive director. Nicholas Manousos, right, is president.

***HSNY photos courtesy of Atom Moore.**



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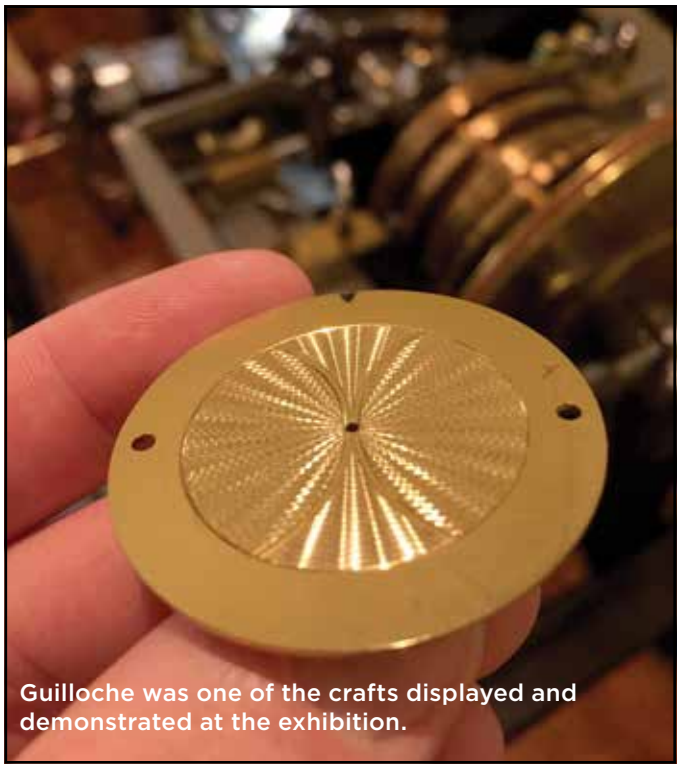


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Masters demonstrated miniature painting on enamel, hand engraving, guilloche, and marquetry. Each artisan engaged the visitors and answered questions about their work. You can watch videos and learn more about the crafts at www.patek.com/en/insider/rare-handcrafts/the-crafts.



A demonstration of miniature painting.



Guilloche was one of the crafts displayed and demonstrated at the exhibition.

The museum was filled with monumental watches of both international and American importance. You may have expected all the watches to be made by Patek, as I did, but you would have been wrong. On display were important watches from the 17th century forward, including early complications such as chronographs, repeaters, and automata.



A demonstration of marquetry.



A pocket watch decorated with marquetry.



On the left is exhibit S1022. A pocket watch with movement made by Henry Voight circa 1780 in Philadelphia.



On the left is exhibit S0954 The Crystalline, a transparent pocket watch with crystal dial made in Switzerland circa 1850.

On the right is exhibit S0697 The Tiny One, attributed to David-Henri Elffroth (movement) of Geneva, Switzerland, circa 1850. The watch measures just 11mm in diameter and 3mm thick.

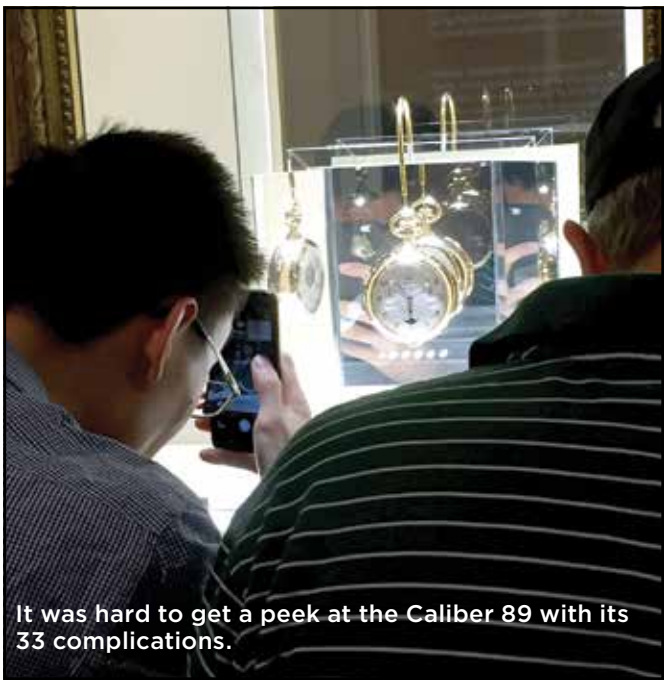
This watch, from the James Ward Packard Collection, was once part of AWCI's museum collection.



Of special importance to the American audience was a watch made circa 1780 by Henry Voight, which is one of the earliest known watches made entirely on American soil.

Some of my favorite watches included a transparent watch made with crystal bridges, circa 1850, and a miniature pocket watch measuring just 11mm in diameter.

Of course, there were plenty of watches from Patek Philippe, including dozens of complicated historical pocket watches and many impressive modern watches as well. The Caliber 89 with its 33 complications was on display, if you could get close enough to examine it. A special gallery was dedicated to Patek watches owned by prominent Americans like John F. Kennedy, Henry Graves, and, of course, James Ward Packard. For those not familiar with AWCI's history, James Packard donated 35 watches to the Horological Institute of America, which later became a part of AWCI. The watch on display at this exhibition was once a part of our museum collection.



It was hard to get a peek at the Caliber 89 with its 33 complications.

To further build interest in fine watchmaking, the exhibit had a second story where attendees could watch four watchmakers at work and ask them questions. There were working 12" acrylic models of a chronograph mechanism and a perpetual calendar and a virtual model of other complicated watches by Patek Philippe. With the headset in place, I felt like a tiny ant wandering through the middle of horological marvels.

http://bit.ly/2vGWBeA
Scan the code or visit the link to see a video of a perpetual calendar model in action.

I have never been in a place where so many people stood in awe of the marvels of watchmaking. Patek Philippe did an excellent job of selling their product, but also of developing a love and appreciation for fine watchmaking in general. Thank you.

While all of this was happening on 42nd Street, you could venture over to Rockefeller Center where Christie's had a display of more than 300 Patek Philippe watches for sale or auction and a few on exhibition, including a cane owned by James Ward Packard with a Patek watch in the head. Rare items such as a solar-powered Patek desk clock, a nixie tube clock, and dozens upon dozens of beautiful wristwatches and pocket watches were also on display.

While I loved being amidst all this splendor, upstairs was the real reason I was in New York. With the support of Christie's and the Horological Society of New York, we were presenting Horology 101 classes to help collectors appreciate the inner workings of these timepieces. Christie's hosted us in a beautiful boardroom overlooking Rockefeller Plaza for five days of successful horological classes. In each class, we introduced the students to AWCI and the benefits of selecting an AWCI watchmaker or clockmaker when their timepieces need service.



The Horology 101 class at Christie's.

Whether it is the collector who wants to gain a greater appreciation, the beginner who wants to become an expert, or the seasoned professional looking to update and improve his or her skills, AWCI supports and provides horological education.

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