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COVER

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President's Message

By Dennis Warner, CW21

For the past two years it has been a privilege to serve you as president of AWCI. I thank those who have made this period of my life one to be cherished forever. When you read this there will be a new president of AWCI elected and sworn in. I know he or she will receive the support from you to continue with the achievements of many years and to meet the new challenges ahead.

The successes of the past two years stem from strong Boards of Directors and committees that fulfilled our goals and objectives. The Board of Directors thanks each and every member of those committees for their time, energy and expertise. Without the help of our dedicated office staff in Harrison, OH, neither I nor any of the committee persons would have been successful. The staff always came through whether it was a small request or a project that took months or years to accomplish.

They are: Ex. Director: James Lubic, CMW21; Finance Director: Thomas J. Pack, CPA; Watchmaking Instructor/Certification Coordinator: Thomas D. Schomaker, CMW21; Laurie Penman, Clock Instructor; Donna Baas, Editor/Advertising Mgr.; Nancy L. Wellman, Education Coordinator; Sharon McManus, Membership Coordinator; Daniela Ott, Receptionist/Technical Support; and Jim Meyer, IT Director. There are those who are no longer with AWCI and should be recognized for their contributions: Lucy Fuleki, Heather Weaver, Manuel Yazijian, CMW21, and Mary Huff.

Each president sets goals and objectives for all the committees. The president sets personal goals that he would like to see come to fruition during his/her time in office.

Mine were to see a balanced budget before leaving office and a degree of success in our watch and clock certification programs. Through much time and effort the Finance Committee chaired by Treasurer, Jack Kurdzionak, CW21, presented a balance budget that was approved by your Board of Directors for 2008-09.

The long-term goals and emerging achievements of the certification programs, mainly through the efforts of Jerry Faier, CMC, and Vincent Schrader, CMW21, can be substantiated through recent postings in the *Horological Times*. We are having more members become certified in the 21st Century programs and the classes that support the watch certification exam are full for the balance of this year. The clockmaking classes have just been announced and are filling.

In closing I thank those who have served as directors for the past two years. Tremendous thanks to the Executive Committees (officers) who worked together for the success of AWCI.

They are: Tamara Houk, VP 2007-08; James Sadilek, VP 2007-08; Matt Henning, Secretary 2006-08; Jack Kurdzionak, Treasurer 2006-08; Mark Butterworth, VP 2006-07; and Gene Bertram, VP 2006-07.

From the time I took office, Past President Jim Door was always there for guidance. One could not have asked for a more knowledgeable and helpful Parliamentarian than Paul Wadsworth who made himself available 24 hours a day. I would like to recognize everyone who worked these past two years, but that would take volumes. So accept my overall gratitude to all. I wish the best of luck and success to the new Board of Directors and your new President.

Executive Director's Message

By James E. Lubic, CMW21

This month is our organization's Annual Convention and Educational Symposium in St. Louis, Missouri. There are many things to be optimistic about in our future. AWCI's present and future will be discussed at length during convention weekend. The following is my prediction for AWCI's future as was communicated to the Strategic Action Committee this past year. This may seem like a real stretch to many of you, but I believe this is very conservative. Get involved with AWCI and help to elevate our profession to a new level!

Predicting the future, I believe that in the year 2017 the premier horological institute in the world, AWCI, will have 6,000 members. Of those 40% (2,400) will be clockmakers. Then, of course, 60% (3,600) will be watchmakers with varying degrees of skill levels. I believe that 20% of our members will be CC21s or CW21s (1,200 total, 480 CC21, 720 CW21). I believe that 5% of our members will be either CMC21s or CMW21s (300 total, 120 CMC21, 180 CMW21). I also believe that 50% (3,000) of our members will be Watch Specialist (WS), Watch Technician (WT), or Clock Assistant (CA). My crystal ball isn't clear on the percentages of each, but I believe it will be something like 15% (450) WS, 25% (750) WT, and 10% (300) CA. If my math is correct, that means we have 25% or 1,500 members remaining. I believe that 10% of the total membership or 600 (40%) of the remaining 1,500 will be serious hobbyists. Of the remaining 900 I believe 300 members will be made up of 150 IAB members, 30 Affiliate Chapters, and 10 REC Schools, leaving 110 student members, or approximately 11 students per school. That leaves 10% of our total members or 600 members who don't fit any category. They could be the revolving 10% of membership that we traditionally experience joining for a short period of time but aren't long-term members. They are replaced annually by a new batch of tire kickers. To me these are conservative numbers.

Membership is a big variable. The United States Bureau of Labor Statistics says there are approximately 5,000 professional watch, clock and camera repairers in the USA; a study for the Federation of the Swiss Watchmakers in 2001 came up with around 6,000, and David Christianson wrote articles for the *HT* addressing this same question, and he came up with approximately 7,000.

If we use the membership numbers that we have today, and the conservative numbers of the BLS, AWCI has about 66% or 2/3 of all professionals as members currently. Who's to say the other 1/3 aren't camera repairers; therefore, showing that we have 100% of all professionals as members. I know that isn't true, but I say this to make the point that in order for our organization to prosper into the future we need to grow our membership. Using the numbers above, the possibility of growth doesn't look very possible.

This is why I'm very excited about the WS, WT, and CA. By all indications these programs have the possibility and probability of growing AWCI. By how much, we really don't know. When surveyed, 87% replied that the WS and WT programs are programs they are interested in, and interested in hiring individuals with those skills and knowledges.

Continued on page 35.

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Questions & Answers

By David A. Christianson, CMW21, FAWI

Question

I am looking for any information you can provide on this pocket watch.

Michael Mirman
Warren, RI

Answer

Your open-faced pocket watch is a Swiss-made (marked "Swiss" on the barrel bridge) bar movement, machine-made and machine- and hand-finished sometime between 1870 and 1900. The style of the movement and its finish suggest this time period.

Your movement is stem-wound and pin set. Pin-setting was most commonly used during this period between 1870 and 1900. The style of the hairspring stud holder suggests that the watch was finished in La Chaux de Fonds. To be correct, the regulator arm (tail) should actually be positioned nearly opposite of the stud holder so that it lies on the regulator scale that is stamped on the radius of the 2nd and 3rd wheel bridge.

I cannot tell you who made your watch but it is well made and nicely finished and would have been a good timekeeper.







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Letters to the Editor

In the last issue of this periodical I read an article about Customer Service. The article covered issues such as etiquette, messages and punctuality. This prompted me to think about the way we interact with each other. As the manager of Father Time Antiques, I have many responsibilities; among them: overseeing repairs, ordering parts, and dealing with subcontractors who do many things from dial refinishing to machining. Many of our suppliers are AWCI members, and I have found all of them to be cordial when I am lucky enough to reach them!

Unfortunately, I have to say that I have never experienced an industry that has so little regard for the value of communication. I am constantly forced to call suppliers who are unresponsive regarding jobs they are doing for us. I often find myself having to call to find out the status of jobs that are behind schedule. I am forced to call contractors that have not even acknowledged receiving a job from us. One machinist to whom we sent a wheel fabrication job told me: "Oh yeah, I think I have it in a pile of mail I have not looked at yet..."

Do I not have customers to answer to? Is it possible that our customers might want to know how long a job is going to take? It does not seem to occur to our trade's people that we might need this information. They treat the business as though it were just a hobby. Some seem to be eccentrics with no concern for the real world.

I have twenty to thirty jobs going at any moment. We document everything we send out or take in. I have records of every job I have done in the last fifteen years, and I can actually find them. I just cannot believe it when I call a dial refinisher and he does not know the location of a dial that I sent! Worst of all, there are employees that cannot tell me what I need to know. They promise a call back, and it never comes. I recently sent a dial to a refinisher I have never used before, only to be left up in the air for the next six months about the status of the repair. I was told repeatedly that it would be ready in "a week or two." They never took the initiative to call and tell me that there was a problem and that there would be a delay. Nope, I had to badger them. Although the job eventually arrived well done, I told them that their lack of professionalism was inexcusable, and that I would not require their services in the future.

I have more than just a few similar stories! If we, as a group of professionals, cannot accomplish the simplest of communications, we will all be tarred by the brush of incompetence.

There is no excuse for a failure to follow up on a business-related question. We do not live in a perfect world, and things can and do go wrong. We all miscalculate occasionally, finding ourselves in situations where we cannot do something in the timely fashion we had promised. It has been my experience that most people are very forgiving, as long as you are up front with them. When I know that there is no way I can make a deadline, I call the customer and tell them what the problem is, and most customers are very appreciative of that candor. My number one rule is this: Never make the customer call you first. When a customer calls, we are put in the awkward position of explaining what is going on with the job, while knowing that they are agitated by our customer service. I will be honest; I hate apologizing for things that are out of my control, but I do it because it is part of the job. If one of our subcontractors promises a delivery date, they should know that I make assurances to the customer based on their time frame. If a problem arises and they cannot deliver on that date, a simple phone call to alert me of the problem will allow me to contact the customer before they are irritated by the delay.

The people we depend on have various admirable skills, and we have the utmost respect for those rare attributes. Many times we are at the mercy of those talented people who seem to be in their own world. I just wish that we could all communicate with each other in a more professional manner. Why should we treat each other with less respect than we give our customers?

Respectfully submitted.

Chuck Atkins,
Chicago, IL

All letters to the editor must be signed and bear the address and telephone number of the writer. Your address and telephone number will not be published without your permission. AWCI reserves the right to edit letters for length and content. All letters should be concerning the Institute and/or issues specific to the field of horology. Please send your letter via: E-mail: magazine@awci.com; Fax (513) 367-1414 or mail to Horological Times, *"Letters to the Editor," 701 Enterprise Drive, Harrison, OH 45030-1696.*

New Members

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Gillis, John—Tuscaloosa, AL*
Wilson, Walter Byrd III—Huntsville, AL*

California
Cohen, Ramin—Los Angeles, CA
Guevara, Juan G.—Rancho Cucamonga, CA
Kuc, George—Arcadia, CA

Florida
MacAvoy, Wayne—Bonita Springs, FL*
Woodrell, Gregg—Naples, FL

Kansas
Ridgway, Ray—Dodge City, KS

Minnesota
Juaire, Janelle L.—Saint Paul, MN

Missouri
Brune, Craig—Washington, MO

Nevada
Hoang, Patrick—Las Vegas, NV
Smith, Nathan—Las Vegas, NV

New York
Decker, Dwane—Red Hook, NY

Ohio
Michaels, Michael—North Olmsted, OH

Pennsylvania
Pentrack, Michael—Johnstown, PA

Texas
Clarke, Houston F.—Richardson, TX

Virginia
Gutierrez, Robin—Merrifield, VA

International
Armstrong, George—Banbridge Co. Down, Ireland
Scott, Malcolm—Canberra, Australia

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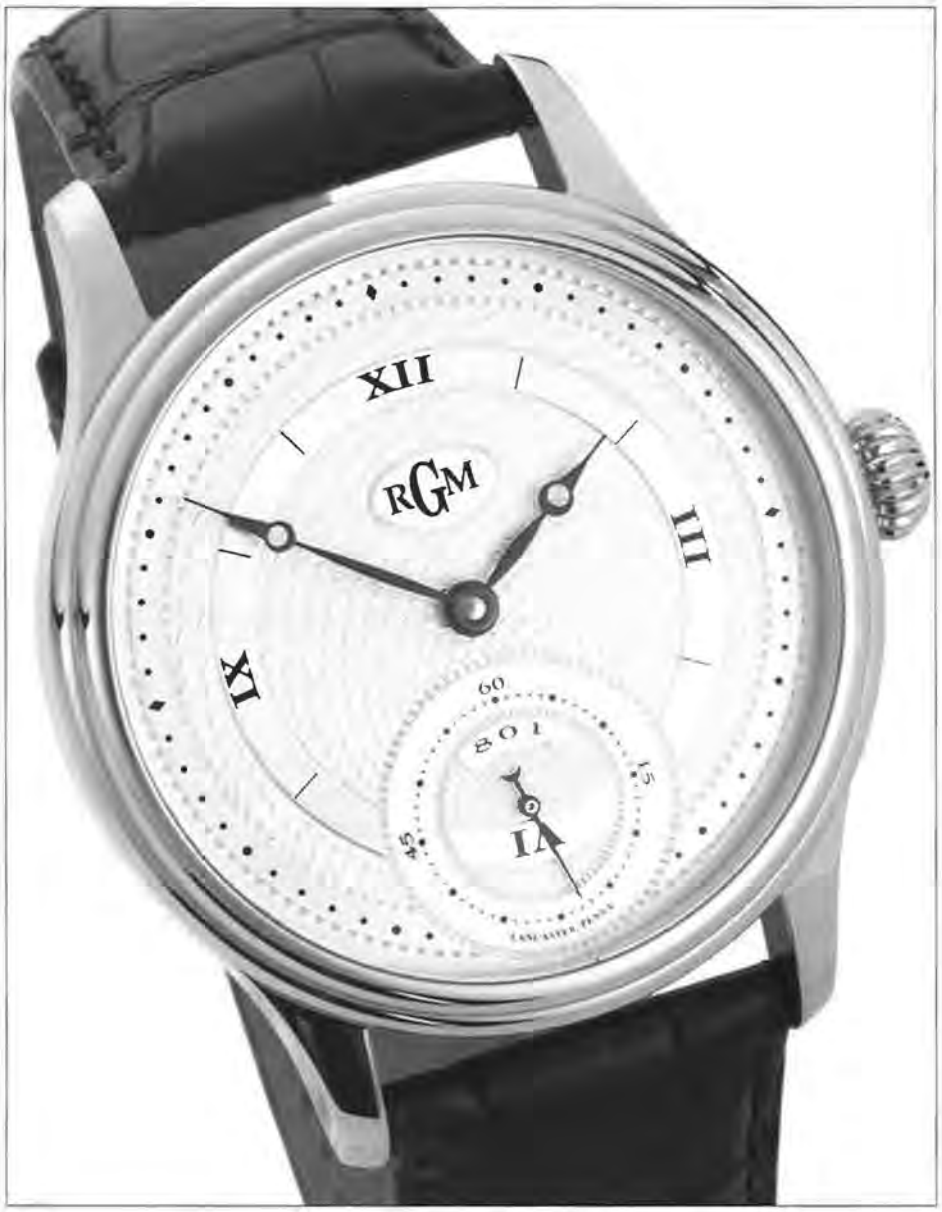
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RGM Caliber 801

By C. Bradley Jacobs

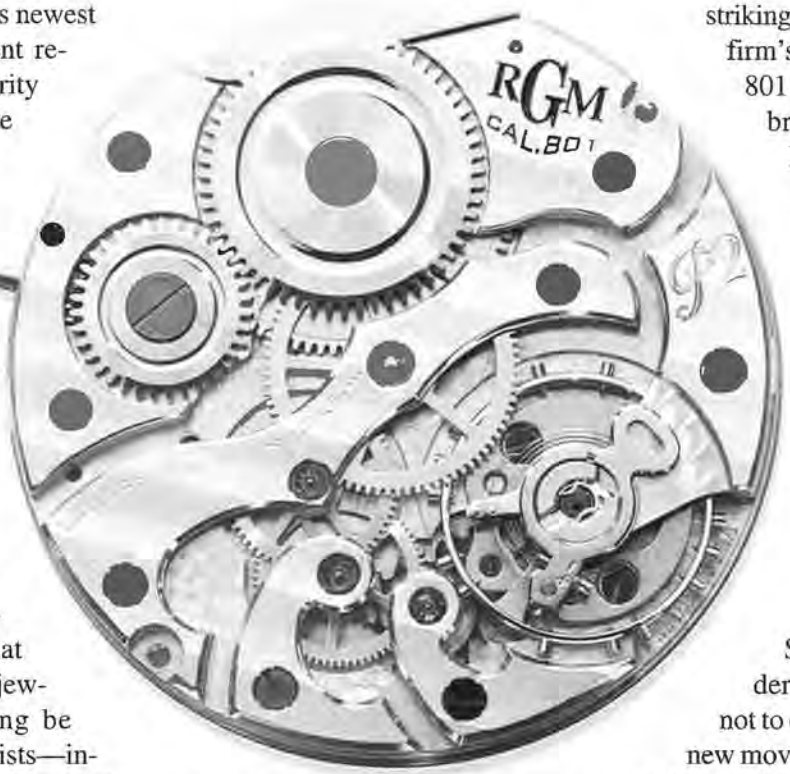
After nearly four decades, the phrase "Made in America" is once again stamped on a mechanical movement. The RGM Watch Company, of Pennsylvania, is preparing the unveiling of their proprietary Caliber 801.

Caliber 801, named for the address of the company's workshop in Mount Joy, Pennsylvania, is a 16-ligne time-only movement with small seconds in hunter configuration. In a time when other boutique watchmaking houses are cooperating with specialist houses to produce unique complications, it is fitting that RGM's owner, Roland Murphy, has chosen a traditional time-only movement for his company's first foray into movement production. His brand is known for its traditional approaches to watch assembly and decoration—such as the use of antique rose engines for application of authentic guilloché—therefore a classic three-hand watch seems a good, and typically American, place to start.

The impetus for creation of a new movement by RGM came from two major sources. One is purely practical: the desire to be more independent; the other is more idealist: a craftsman's natural urge to create a beautiful object of quality, without compromise. To this latter end, the planning and design of Caliber 801 went through several phases over four years' time. The result is a versatile movement—suitable for either wrist or pocket watch use; and Murphy plans future elaborations—that hearkens to watchmaking traditions once strong in the United States, indeed in RGM's own backyard.

An examination of America's newest mechanical watch movement reveals much about the integrity of its makers. It would have been easy for RGM to rely heavily upon established Swiss suppliers for the majority of the material in the new movement, but Mr. Murphy felt strongly that the movement should have a recognizably American character and be produced, as much as possible, in Lancaster County. Though in the current state of American horology it was unavoidable that some components such as jewels, balance and hairspring be outsourced to Swiss specialists—indicative of a decades-long decline that felled all the major domestic houses of yore—the spirit of ingenuity and entrepreneurship that characterized American watchmaking at its peak was found to be alive and well. Thus RGM partnered with local experts in computer-aided design and machining to bring their vision to life. Production of the bridges, plates and other parts are made not only in the USA but in Lancaster County, Pennsylvania, the final work of tapping or reaming holes, setting jewels, finishing of plates and bridges, adjustment and assembly will take place in the RGM workshop in Mount Joy, Pennsylvania.

Roland Murphy drew upon many of the elements of American watchmaking that he admires, and even pays homage to such significant firms as Howard, Illinois and Hamilton in Caliber 801. This may be more than mere coincidence, considering the first two of those firms all became the property of the third, itself headquartered a short buggy-ride from RGM in the city of Lancaster. However, the new RGM movement is anything but a copy of any existing or historical movement. To the pocket watch enthusiast familiar with the Howard Watch Company, the bridges of Caliber 801 will bear a striking resemblance to one of that firm's finest products. Caliber 801 intentionally has similar bridge shapes, chosen by Mr. Murphy for their beauty and ability to expose all the workings of the gear train. To paraphrase a recent statement by Roland: what would be the point of making the movement visible through the back of the watch without also allowing a clear view of the interaction of the wheels? Aficionados of Swiss watches will also understand RGM's stipulation not to employ wire springs in the new movement—a quality measure akin to those necessary for the famous Geneva Seal. Caliber 801's elegant semi-hidden click spring and similar springs within the setting mechanism are milled from solid steel rather than fashioned from bent metal wire.



Caliber 801 prototype – Note E. Howard bridge inspiration.

The Caliber 801 has many more impressive technical features, most of which lie beneath its beautifully gilded surface. The plates and bridges, machined from brass, house nineteen



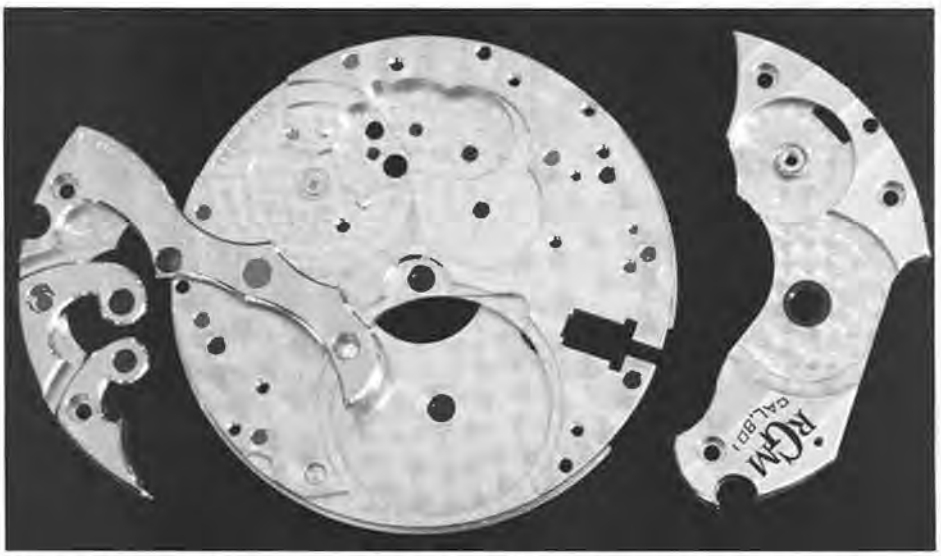
Cased and finished 801. Stainless steel 42 mm diameter and 10.5 mm in height. Movement may be finished in rhodium or gold plating, skeletonized, engine turned or traditionally finished.



Completed components, many of which made in-house, ready for assembly.



RGM's supervising watchmaker, and 801 guru, assembling caliber 801 movement.



Mainplate and bridges are manufactured by RGM, nicely finished in-house and jeweled to the barrel.

jewels including two large barrel jewels made specifically for RGM. Though the necessity of jewelling the barrel is debated to this day, Murphy and his team have discovered wear in the metal bearings of barrel arbors in movements that RGM services and felt it would run contrary to their aim of top quality if they did not address this potential source of friction. Other issues of assembly and servicing were addressed in the design stage, one example being an extended pilot hole which will guide the full length of the winding stem yet allow for proper lubrication and freedom of movement. All feet of the bridges are integral—created from the original billets of brass as the bridges themselves are machined.

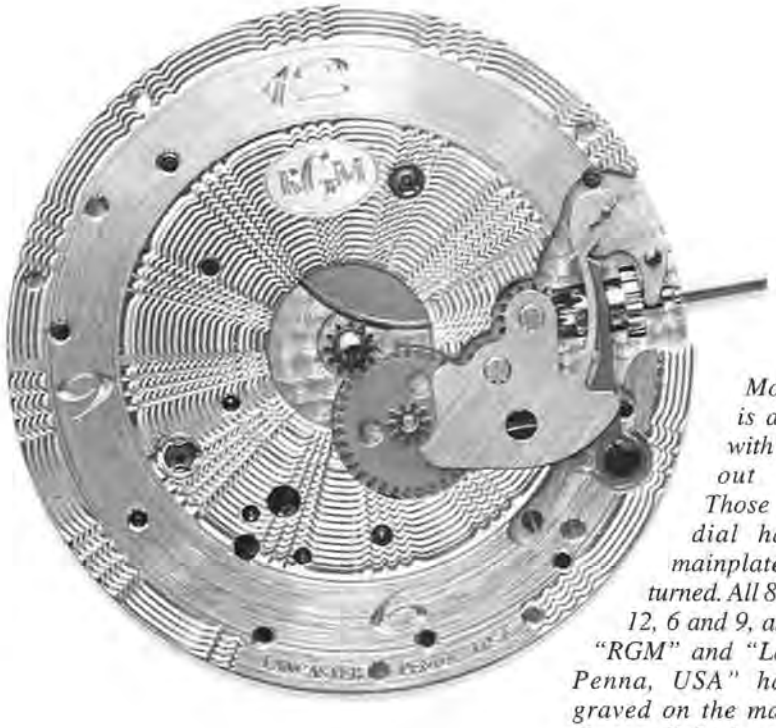
Not all such production decisions were made purely for technical reasons. Several almost invisible elements of the movement were the result of conscious aesthetic choices coupled with the team's striving for ideal functionality. Murphy and his designers made sure that every hole and recess in the plate of Caliber 801 is functionally necessary—as a result, no extraneous holes detract from the beauty of the movement in its uncased state. Only three holes, intended by Murphy for attachment points for future modules, are unused in the plate, and these are untapped and unobtrusive. The recesses milled into the plates for the gear train are a pleasing array of overlapping circles; other recesses near the edge of the plate match up directly with the sides of the bridges; dial screws that penetrate the sides of the plate serve to reduce the clutter on the dial and train sides of the plate. If all of this seems excessive, there is a beauty, as well as a method, to the madness.

A decorative element of Caliber 801 that particularly pleases Murphy, and he hopes will be of significant attraction to watch connoisseurs, can be seen on the mainplate. Every Caliber 801 plate is manufactured with functional

engraving on the dial side: an hour chapter ring with numerals denoting 3:00, 9:00 and 12:00, the oval RGM logo, and the words "Lancaster, Penna. USA," below the sub-seconds area. RGM intends to offer a variety of dial options (and dial-less decoration options) for the new movement but every example of Caliber 801, regardless of whether it is assembled with a dial, will have these features as a trademark.

The last time that high-grade mechanical watch movements were produced in the United States was 1969, the year that Hamilton ceased a period of more than 70 years of continuous manufacturing at its facility just down the road from RGM's current headquarters.

For 2008 RGM intends to produce 75 to 100 examples of Caliber 801. Eventually it will become the standard that represents the image of the company. Once RGM's existing supply of Swiss 16-ligne movements is exhausted, all models thus powered will only be available with Caliber 801.



Model 801 is available with or without dial. Those without dial have the mainplate engine turned. All 801s have 12, 6 and 9, as well as "RGM" and "Lancaster Penna, USA" hand engraved on the mainplate. Custom dials also available.

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A Tour of the

RGM Facility

in Lancaster County, PA

By Curtis Thomson

In 1999 I was a watchmaking student at the National Association of Watch and Clock Collectors' School of Horology in Lancaster County, Pennsylvania, when I first heard of Roland Murphy and RGM. I was quite intrigued to know that an American watchmaker had his own brand that had been producing nicely executed watches since 1993 in my own backyard. Not only that, he was doing so in the shadow of Lancaster's Hamilton Watch Company.

As luck, or the lack thereof, would have it, I did not have the chance to meet Roland while I attended or taught school in Lancaster. I of course was well aware of what RGM was doing over the years through ThePuristS.com, meeting collectors and the like, and, I must say, I was impressed with the breadth and appearance of quality in the RGM stable of watches. Upon returning to Lancaster in 2001, after being away for little more than a year, I began the business of restoring watches and clocks. To be honest, the thought of visiting Roland had left my mind by then.

As a diversion from work at the bench, I started writing sporadic articles for ThePuristS.com. Sometime in late fall 2002, I was asked by *IW* to visit RGM. It's funny how life's opportunities reveal themselves: The moment my thoughts drifted from a visit to RGM, the chance arose.

One cold and rainy November afternoon, three years after first hearing of Roland Murphy, I find myself driving to his place of business. Mount Joy, Pennsylvania, is an unfamiliar part of Lancaster County, so I drive slowly, peering through the rain looking for what was once the local bank and is now America's foremost luxury watch company.

After mistakenly guessing several approaching bank-like buildings to be RGM, I came upon this simple but attractive two-story corner building, with RGM stenciled on the door and a monogrammed clock above. Parking on the side street, I find that the doors to RGM are locked, which immediately imparts two thoughts: 1) walk-ins are not welcome, and 2) serious business goes on behind these doors.

After a moment of waiting the door is opened by one of the four watchmakers employed at RGM. After a quick introduction I am asked to wait for someone to lead me upstairs, which gives me the chance to preview RGM's working area. The ground floor is spacious, a large room with high ceilings, good light and plenty of room for expansion. Being an old bank there is a secure vault where the watches (new and old) are safely stored. Four watchmakers—Marty, Ralph, Allen and Russ—are busy repairing watches, from chronographs to quartz time-only pieces, on one side of the room, while several watchmaker's lathes—a Levin 10 mm lathe, a jig borer and a small high speed precision drill—line the other side of the room. A beautiful rose engine sits proudly in the corner, which, I am later told, will not be used for dials but for doing decorative work to case backs. Cleaning machines, buffers, case refinishing and the like are found in small, enclosed rooms.

Standing there, taking it all in, I began to think that RGM was as much a repair center as it is a watch brand. This was a fair assessment and one that is a reality for the little fish in the Swiss watch ocean. RGM must be diversified in its business strategy, which includes authorized service accounts for several Swiss brands, as well as repair work for select jewelry stores and individual clients. "It gives us a good anchor of work," Roland would later explain.

While I had never met Roland I had seen his picture many times in print and on the Internet, so when a burly man wearing a green RGM golf shirt and a smile approached me from the stairs,



RGM workshop - Engine turning machines (rose and straight line) used for dial and movement decoration.



RGM's chief designer, Richard Baugh, engine turning a dial. Starting with the model 801, RGM intends to do all engine turning in-house. This includes dials and movement decoration.

I knew it was him. After a firm handshake and warm greeting, we made our way upstairs. Explaining that they had moved to this location earlier in the year, he spoke of renovations to the building, which is owned by RGM. With obvious pleasure he pointed out various details of the building. And who could blame him? It was fantastic! Alive with history and romance, it encompasses two essential watchmaking ingredients.

The business elements of RGM are upstairs. In the shipping/receiving office, Mike keeps an accurate account of all items coming in and going out, which, from empirical evidence, is well organized and furiously paced. We pass another room as we make our way into his office. It is a large office with a round table for discussion, or entertaining. Roland offers me a seat and then sits behind his L-shaped desk and instinctively grabs the computer's mouse and clicks away at what must be hundreds of e-mails received weekly.

Casually he begins, "We don't build RGM watches every day, but we may go through spurts where we build RGM watches for several days. We may build twenty to twenty-five pieces (of a certain model) and then may not build that watch for several months before we build it again."

Building between 275 and 300 watches each year, RGM has developed a portfolio of timepieces that is quite comprehensive. From time-only pieces to minute repeaters and tourbillons, RGM has provided its customers with some of the best value-for-the-money watches in the industry. To illustrate this point, we discuss RGM's Master Chronograph.

The Master Chronograph (limited to twenty-five pieces) has an 18-karat rose gold case with sapphire crystal and display back and is a comfortable 38.5 mm in diameter and 12.6 mm in thickness. The nicely executed case houses a 17-jewel, manual wind rhodium-plated Valjoux 23 movement. This classic column-wheel chronograph has perlaged plates, as are the undersides of the bridges and cocks. All of RGM's watches receive this added value and fineness, performed by Mr. Murphy himself. The bridges are hand-engraved by a master engraver, which adds to the individuality of the piece as the engraver's hand will never exactly duplicate the previous work—a little deeper here, a little lighter there, a bit more fanciful today than that of yesterday. All steel parts are finished as required, including all screw heads to a flat polish. Excluding the hand engraving, the finishing work described above and the assembling and adjusting of the movement takes the better part of a week. The engine-turned dial, with seconds and 30-minute registers is gorgeous, as are the blued steel hands.

Moving to Richard Baugh's office, RGM's graphic designer, website designer for RGM and Equation of Time (Murphy's watch discussion forum), photographer and Roland's right-hand man when designing watchcases and dials for RGM, I see the heart of the company's creative body. Rich is a talented artist who wears both the advertising and marketing hat for the company. Any drawings, logos, brochures, etc., are all under his umbrella. Originally Roland shouldered the load himself, but he now assists in these areas at various levels.

Being an all-American company certainly separates RGM from the Swiss-dominated industry, but something else also separates it from the crowd. RGM is one of the few companies that will undertake custom jobs. Can't find design features you want on the market? Call Roland and Rich and they will work with you to find a solution. Using the computer, they are able to offer customers a dizzying array of modifications and alternatives for case materials, dials (enamel, engine-turned, engraved, color), hands, movement features, etc. Each step of the way they share their progress with the customer via accurate computer printouts, so that each party knows and understands exactly what is being discussed.

As an example, they show me a platinum-cased one-minute tourbillon, minute repeater wristwatch that they have recently delivered to a customer. This watch has an engine-turned dial (with both the customer's initials and the RGM logo) with portions cut away to expose the tourbillon, hour and minute hammers and motion work, all of which enhance the experience for this particular purchaser. Roland planned to offer a handful of these pieces without the initials. "There are a couple of different dials I have had made, and over the next year I will have, maybe, one piece available that someone could buy that would be done. It's not something that they have to special order; there is something that will be ready that they can attach their name to now and it could be theirs. Primarily watches like that take a long time." Indeed.



RGM's Seven Day watch, with power reserve. Stainless steel case – 42 mm x 12.7 mm. Limited to 30 pieces.

Leaving Rich's office, Roland points to his secretary Karen's office. He then points to two RGM posters on the walls, one being a stunning minute repeating, perpetual calendar and the other a one-minute tourbillon. Both watches have brilliantly executed engine-turned dials. The posters remind me that, while RGM's best-selling watches are from the affordable Pilot line, this company has something to offer at all ends of the spectrum of the collecting rainbow, and at a value and quality that few comparably priced watches can match.

As we walk past a stack of FedEx boxes on our way downstairs, Roland explains, "Repairs are by far the largest (percentage of the RGM business) because we are doing so much work for so many companies. Also it gives us an advantage to see all sorts of products in the things that we do: vintage restorations from Patek, minute repeaters and modern chronographs." They repaired around 1,600 watches for the year 2002. At this point Roland informs me of the plans for the rest of the visit. "I am going to demonstrate for you, while you are here today, the beginning of Master Chrono. I can demonstrate the perlage, if you'd like." With much pleasure I agree to the plan but first we enter the safe and have a look about.

The safe holds the RGM inventory, which includes many cases, movements and all repair work. With great interest I await the first of several black velvet trays with what would be my first up close and personal examination of RGM watches. The first watch I see is the Master Chronongraph and it is truly a gorgeous watch. There is a three-register chronograph in the new style chrono case, an engraved movement and a dial from the old Gold Chono watch of years past. This combination gives someone the opportunity to buy a unique piece, without having to have RGM build a custom watch. One of my favorite RGM lines is the William Penn, of which, two of the four styles were present (one with moon phase and one with calendar). The uniquely shaped rectangular case houses a tonneau-shaped movement, which offers four versions: three of the four have a power reserve sector with either sub seconds, moon phase or calendar at 6 o'clock. The fourth version is a jumping-hour (aperture at 12) watch with eccentric minute chapter ring and sub seconds at 6 o'clock. All four versions have engine-turned dials.

I will refrain from further details since there is so much more I could talk about; however, it was time well spent and allowed us to speak about The Swatch Group and about the direction in which he plans to take his company.

As with most in the watch industry, Roland has some concerns over the posturing of The Swatch Group. "It affects a few of our suppliers. I am not sure exactly how far it will affect what we are doing. We are going to be ordering some things directly from ETA. We are an approved customer of ETA, so we don't really have a problem buying from them. But some of the special (products) we need come from other companies, so we do have concerns about the supply of hairsprings and escapements and things like that, which come from Nivarox. This concerns us because we have some

inventory, for instance, on our William Penn, where we have a lot of cases and things, and we need to be able to get those ebauches. If our supplier has trouble getting what we need, that could be an expensive problem. Since we are not yet sure what the final situation is, we are still in a wait-and-see mode for the moment.

"But, we are going to continue making watches with new movements, using various ETA movements and other movements; we are also going to be using some more vintage movements that we'll be transforming in other models. There are a few other projects we are working on. We're pretty wide open with the various calibers and things that we are willing to try to use. As long as they meet the certain quality criteria we can upgrade them to where they need to be—it really isn't a problem."

What about an in-house caliber, you may wonder? Well, there are drawings for such a thing, but without the financial backing to support the research and development, it is not an option. Plus there are still the concerns surrounding hairsprings and escapements from Nivarox. So, no, a new caliber from the ground up is not in the pipeline, but that doesn't rule out modifications or modules for existing calibers if he is so inclined.

What Roland does see for the future is growth in production. He would like the company to build between 500 and 1,000 watches a year within the next several years. This is a very attainable goal given the quality of the product and efforts made yearly to offer something new to the purchaser. Whether it is a completely new model or a cosmetic variation to an existing model, RGM aims to keep its fans interested and pleased. Additionally, there is no real desire to grow beyond 1,000 watches a year. "Our goal is to stay small; to create small series of special pieces that have a lot of handwork and a lot of care to them. This makes them more exclusive because there aren't that many of them. To continue our business the way it is, with our alliances, with the companies we service, the restorations of antique watches—I think this makes a nice balance."

Ending on that note, the watches are put away and we go to his bench, which is on the opposite side of the room of the other watchmakers, with the machining equipment. It is here that he will demonstrate the perlage techniques he uses on all of the watches he builds and, in this case, the Master Chronongraph.

Showing me a vintage Valjoux 23 movement, he proceeds to disassemble it, and all steel parts, including eccentric screws, are removed from the plate and cleaned of oil, grease and debris. Moving the plate to the high-speed drill, he inserts an industry-standard abrasive bit, which comes in a variety of diameters, for perlage into the drilling spindle. It is important that the end of the bit is flat and that, once determined, the downward vertical travel of the bit is set, so the circular pattern left by the tool will be uniform throughout. The drill is operated at a high speed as the plate is rotated, by hand, on a jig, which allows concentric circles to be made. In other recesses of the plate, it is not possible to use the jig and these areas are done freehand, with a smaller abrasive bit.

The work is not complicated, but does require some care if it is to be done properly. It takes a full day to perlage all the necessary surfaces, which is the first step in the decorative process for the bridges and cocks. Next, they are sent off to the hand-engraver. RGM offers several decorative finishes, but Roland is clear on his favorite. "I personally prefer hand-engraving on a movement. Most people who purchase watches are not watchmakers, but the beauty of a hand-engraved movement—the way it reflects the light—is apparent to whomever you show it to. The combination of hand-engraving and perlage captures light in such a beautiful manner."

In addition to demonstrating his perlage technique Roland also refinishes a screw head, which is in especially bad condition, using various grades of 3M papers starting with a coarse grain and progressively working toward a fine grain for the final finish. The Levin 10 mm lathe is used with the screw being held in a micro drilling attachment on the cross slide and rotated quickly. The 3M paper is placed on a flat disc and rotated in the opposite direction of the screw. All screws and wheels are inspected for the quality of finish in the vintage movements they use. If any are found substandard, they are refinished in the above manner.

During the process of perlaging. I ask Roland what he intends to use his jig borer for. (A jig borer, also known as a pointing machine, is a high-precision tool used most often in the production of prototypes and one-off watches. A microscope is used to locate the position [x and y coordinates] of the hole. Once the hole is located, the microscope is slipped out and replaced with a mill/drilling spindle to accurately drill a hole or do light milling operations.) "I am going to be making a few one-off watches here and there; a few specialty complications that won't be found in our general catalog."

With that said, he shows me something he has been working on when time allows. Using a William Penn movement as the base, he has made a module that converts its standard time telling into a regulator style. Using the jig borer to make the module plate, Roland found the other needed components in his stockpile of parts. Far from finished, the module needs to be rhodium-plated, parts need to be finished, the base movement needs to be perlaged, hand-engraved, rhodium-plated, a

special signature must be added, a William Penn case needs to be modified for the added height and a unique dial will be added to continue the fun.

After another quick tour of the facility, it was time to close up. I thanked Roland for his time and he quickly offered his services to me if I needed anything in the future. He locked the doors and we walked to our vehicles together in the freezing rain of this cold November night.

As I sat in my truck my mind raced over the events of the day. I expected to find quality watches that proved to be of a superior value for the money—and that is exactly what I found. Roland Murphy is keenly aware of what his place is in the market. He quite simply provides the best watches he can for his clientele. He was honest and forward about whom his suppliers were and what he was doing and what he was not doing. RGM uses proven, reliable movements and gives them added value with hand touches, such as hand engraving and perlage, with first-rate dials and cases, while keeping the finished product exceedingly affordable.

I watched Roland pull away in his PT Cruiser, which seemed quite fitting to me; an American retro car for an American retro watchmaker. RGM may never escape the shadow of Hamilton Watch Co., nor be fully accepted by the Swiss industry, but I don't think either thought occupies his mind. He is comfortable and confident with RGM. And why wouldn't he be? It is America's finest watch company.

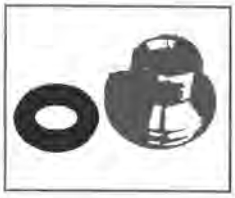
About the Author

Curtis D. Thomson is a watchmaker in Walpole, NH specializing in complications and restoring antiquarian pieces. He is also the founder of "tempered" (www.tempered-online.com), which provides a platform for the artists-craftsmen represented on the site.

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By Mark Butterworth

The Modern German Clock Movement

Part 77

Safety Is No Accident II, or Not for the Squeamish

This is one of those times when a true story comes along that is so amazing it demands to be told, and hopefully we all learn a lesson. The saga is from fellow AWCI member, Tim Ursch from Illinois. This is the story as he told it:

"Today started out like a normal Monday. I do my grandfather clock service calls on Mondays. I went on my first call and picked up an Urgos triple chime cable movement for an overhaul. I headed to my second call. The owner greeted me with a smile and a friendly handshake at the door. He showed me to the grandfather clock that is giving him trouble. It is a newer Bulova triple chime cable Hermle movement clock. The clock keeps stalling out. I notice that one of the hammers was raised and he told me that his wife likes to change the chime often. I figured she needed to be instructed about when to change the chimes but I also want to remove the movement from the case to check the condition.

Bulova decided to not only screw the seat board down but also to glue it down. I removed the mask and the dial and proceeded to remove the seat board. I had my left hand on the outside of the case and was using my right hand with a straight blade screwdriver to break the glue bond.

The seat board suddenly broke loose, but when it did the screwdriver jammed into my left wrist and severed an artery. Blood suddenly stated gushing out of my left wrist. I immediately applied pressure and set out to find the owner. He came running into the house and got me a towel. As soon as I removed pressure to put the towel on my hand, blood again rushed out of my hand like a faucet. He called 911 and got me to sit down. The paramedics arrived and when they removed the towel to put on a proper bandage, one of them got sprayed in the face with blood.

During my ambulance ride to the hospital the EMTs started an IV. Several minutes later one of the EMTs discovered that the IV had come apart and now I had a pool of blood on my pants from my right hand bleeding. It just wasn't my day. I went to the emergency room in the local hospital where I was met by my wife. Soon after I arrived, the ER doctor took a look and said that I would need to have the hand bandaged and splinted and would need a tetanus shot to top it off. He left and said he would be back soon. I desperately needed to go to the bathroom so a nurse showed me down the hall to a one-person bathroom. I went in and did my business. Right after I was done I realized two things: I couldn't pull up my pants and button them and that suddenly where I was wounded was swelling from bleeding under the skin. It got to the size of a grape very quickly. I had to open the door with my pants down and walk down the hall to my room. It was embarrassing."

In the follow-up conversation with Mr. Ursch, he states, "I was forcing the glue joint apart so I could remove the movement from the case. I had my left hand on the outside of the case and my right hand was working with force to break the glue. I had the side panels out. The glue gave loose and the screwdriver continued on that trajectory into my wrist. Right before this happened I considered using the screwdriver like a wedge and tapping it with a small hammer but I thought that the homeowner would hear the racket (the chime rods) and think that I wasn't acting too professional."

Most of us who work with tools for a living at some point have an accident. We are all human and it keeps us humble if nothing else. My most memorable one was the time I didn't use a leather glove while using one of the older spring winders on an old American time and strike main wheel. It let go and I instinctively went to grab the wheel. It acted like a saw. Luckily it was just a nasty cut and I didn't lose the finger. Lesson learned—leather gloves and safety glasses, no exceptions.

What can we learn from Tim's unfortunate experience? From my personal point of view, after finding that the seat board was glued in, I would not have tried to remove it. There are situations such as glued-on cuckoo bellows where we have no choice. In this instance there was a choice. As a generalized rule, never force a tool unless it is absolutely unavoidable. In addition, make certain one has the proper tool for the task. In this case a hammer and wood chisel would have been more appropriate. Also, one must visualize what will happen if the tool slips while being forced or if the piece suddenly gives way as in this case. In addition, I am thinking of the number of cases of injury due to the hand or fingers being in the wrong place while removing glued bellows. Others may draw different or additional conclusions. Hopefully, one is to remind us all that we must always be on the lookout for potential accidents.

Final tip: While removing or installing a grandfather movement, crunched newspaper jammed against the bottom portion of the chime rods will keep them from banging together and making homeowners nervous.

Final thought: *"Long ago when people cursed and worked on secret devices it was called witchcraft. Today it is called Clocksmithing."—Ronnie Bowen.*

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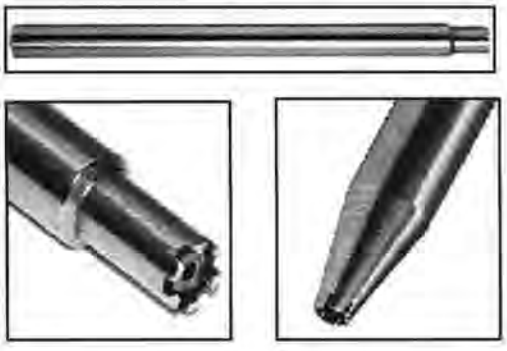
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By Jerry Faier, CMC21

My Mother's Clock

With the recent passing of my mother, an old Sessions mantel clock that she had purchased for me to "fix up" for her when I was doing "clock collecting and fixing" needed to move on to the next member of our family—my older brother. The last time I really did anything to this clock was 35 years ago! What is so interesting about this is that I had an excellent opportunity to compare what knowledge and skills I had at that time with those that I have developed. What an experience! You see, I have only been in practice professionally for the last 30 of those 35 years! Now I have equipment, then I didn't. Now I know a bit more about its history, then I didn't. Now I can make about anything I want and need, but then I didn't. So, was I a hack? Maybe a clock breaker?



My shop in those days was an ordinary basement workbench with a few hand tools on the wall and a bench vise. My first homemade tool was a device to "shine up" those rough shaft ends. I read in one of the two books on clock repair that I had purchased that this was supposed to make the pivot last and work better, and anyway it seemed like a good idea rather than stick a rough surface back in a new bearing hole. Its base was a strip of wood with 2 wood blocks (as movable jaws) that each had a strip of 1/8" x 1" x 2" steel across the ends with a small "V" notch in the center so the pivot would have a place to ride. From there, I took a scraper burnisher (I had no idea they made such a thing for pivots but then I didn't know what I was doing was called burnishing!), oiled it with gun oil, and ran it along the work face of the pivot until it was shiny. What powered it? I would spin the shaft by running my finger back and forth with one hand as I held the burnisher with the other. This also showed me when a shaft or pivot was bent, as it would wobble as I spun it. So when necessary, I used a smooth-jawed pliers to straighten any bent pivots/shafts until everything spun smoothly as I could make it.

I don't remember if there were hand-bushing tools sold separately back then, but I did not have the money or the interest in owning a bushing tool so I made do with cutting and smoothing broaches. Bushings? I used to buy bushing stock because I didn't understand what sizes of bushings to buy. Bushing stock is the 3" long hollow brass tubes that you cut

pieces off of for your bushings. It took a bit of doing but I was able to ream the holes correctly (now I know that I should have been looking for depthings rather than just keeping in the center of the original oil sink) and get those needed bushings to hold solidly in the plates. The best surprise was that I did it without malforming the plates and the bushings look like the prepackaged ones—oil sinks and all!

I didn't own a mainspring winder; but when the first American mainspring "got away from me" while trying to hand wind it into a "C" clip, I decided there must be a better way. It's always noteworthy that the powers to be have mercy on those of us who try to start a new undertaking without really knowing how to do something safely! So, I took a block of wood, about 4" square by 5" long and set a 1/8" x 1" x 5" strip of steel on both ends of the wood square and put a hole at the top of the strips to take a large bolt. Using a 5/8" x 6" steel bolt, I held it in my drill press and ground the threaded end down to about 1/4" O.D. and put a pin in that end about 3/8" from the end to catch the inside of the spring. For the ratchet, I used 3 steel external lock washers that were silver soldered together. (Yep, it was directional!) The click was made of a flat "U" shaped piece of the steel strip with a center hole that carried a screw that held it to the front support strip just under where I would set the ratchet. My directional "click" spring was a piece of 0.010" brass shim stock and it was screwed to the wood and laid in the middle of the click. I took another strip of steel and put a knob through the end of it to use as a crank handle and then silver soldered that strip to the hex end of the bolt. The last step was to silver solder the ratchet in place, use a large nut on the front of the bolt to control the endshake with the ratchet, and then I was ready to use my spring winder. Still not the safest, but better than hand winding, I felt. After the next couple of American springs, I took a large gutter nail, bent it 90 degrees and drove it 3/4 of the way into the wood block and then (you guessed it) silver soldered it to the front support strip. Now, I could safely hold the loop end and still control the spring with a leather-gloved hand. I probably cleaned and wound 1000 mainsprings with that contraption and only once did a spring get away from me. My dog will never let me forget that either. All the spring did was sail over her head!! Did you ever see a dog slink out of a room? It was a true vote of no confidence! From then on, whenever she heard that spring-sprong sound, as I got ready to stretch, clean and regrease a mainspring, she would slink out before the procedure started and not return until she heard me set the beat. Good dog!

So with my tools, I set about "overhauling" Mom's clock. I used an enamel kettle for my cleaning dip tank. I took everything apart and let the pieces sit in the solution. About 5 minutes seemed to make it bright enough to look good. A good hot water wash off, then into another enamel kettle with the rinse solution for 5 minutes and then the hairdryer dry down. I stretched out the mainsprings one at a time and cleaned and regreased them. I did my pivot "smoothing" and bushing work. I checked to see that everything was as clean and debris-free as possible by rinsing one more time in the rinse kettle and then it was back together. I hadn't seen a hook tool yet so I used tweezers. You had to be really careful when you poked things in place so you didn't break off a pivot.

Once the movement was assembled, I took my smooth-jawed needle-nose pliers and adjusted everything to work as properly as I could. When I found out that gravity didn't always shut off the strike, I got to looking at my scrap pile from the work on the movement and that's when I got acquainted with brass spring wire. I finally realized that this is why that stuff was on those levers and started to keep track of the sizes and how they were tied down. Now the movement seemed to work just fine but the old "feather" (the suspension spring on the end of the leader) was really twisted up and useless. Besides that, it didn't keep time worth a hoot! So, through many days of cut

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and try work, I got the thing to keep time close enough to be rated with the adjuster on the front of the movement.

Next, I went after cleaning the case. This old black mantel was really dirty and slopped over with, as my favorite dial painter once told me, bacon grease, fried eggs, fried chicken and as health matters got to be more known, wok cooking stuff. That stuff leaves the thickest scum on a case like this. (Don't you really wonder what it does to your body?) Add to that the coat-overs with who knows what kind of polishes, waxes and the like. Seemed like everything I touched the case with made it greasy or sticky. Finally, I found some cabinet shop friends that steered me on to various cleaning chemicals and a can of a spray wax that seemed to help. The gilt engravings were still kind of filled up but the case and its trim looked good overall.

Now, I put it all together and gave it to Mom to enjoy for the next 35 years. And enjoy it, she did! She used to tell me that the clock was her friend when she couldn't sleep at night sometimes. She said the sound of its tick was a pleasing reassurance to help settle her down until she fell back asleep. She also said she rarely had to touch the hands as the clock seemed to keep very good time. How great and it only took me 4 weeks to do the whole job at that point. I'd starve today at that rate, but then I didn't stay with the same approach either.

Over the next 35 years, I would send up oil and materials to "service the clock." On my next visit to her, I would pull the movement, let down the mainsprings, flood the bearings with clock oil (using a tissue to collect the excess oil) about 3 or 4 times for each bearing working the wheels back and forth and then added a drop or 2 of the same mainspring oil that I used when I originally serviced the movement. Then back to service it went. It actually only got re-oiled like this 2 times during that 35-year period (NOT what I would recommend today), and the only time it was out of service for more than a day to two (when she would miss her normal wind day) was when my father died and then the clock was down for about 4 weeks before she got it going again.

Now, we learn how good a job I really did on that clock. The results were surprising even to me but they speak volumes. Now we have a Clock Standards & Practices to use as a guide for comparison. You want to compare yourself to something, make it the S&P. It will tell you quickly how good you are doing when you check out your "old" work. How did I do?

The cleaning job seemed to hold up OK. No real spotting or finger messes left. I had to do a little more wheel straightening as some were still not as true as they could be (now I spin everything on a lathe). One of the shafts was still not as true as I like them all to be, so it got a little more attention as well. I found the bearings were not worn at all! The pivots all had a dark line around them from the oil/bearing contact point but that polished off again, easily. The pivots did not seem any more worn or rutted in any way. Almost all of the pivot surface polish was still intact. The handmade bushings were no more worn than the pivots and they too still had most of their polish except where the contact point was. Those dark spots came right out with a smoothing broach oiled with clock oil. The only bearing that I thought needed more work was the time rear main bearing which was originally badly worn and another "collector" friend told me to turn it around so the pivot worked on a new surface. Since the pivot had been so well burnished, there was no new wear on that bearing point. Because it was going to my brother, however, I decided to redo that bearing completely. Besides, that's just a more professional solution to the problem that won't require redoing at the next complete servicing. I am glad the depthings were done well on this clock to start with as my just following the old oil sinks could have been a disaster, but in this case they were all right on target. Didn't see any pinion wear as well.

In the old days, I was just using buff sticks to clean up worn strap pallets, but today I use a buffer/polisher to finish the job in addition. That makes the surfaces even brighter and more uniform. My old work was OK. The surface was still nice and bright with a black streak right down the middle of the pallet faces, but that buffed right off with no further abrasive work. The drops and locks needed a bit of attention though. I had left the entrance and exit drops a bit excessive and thus the pendulum action was not what it could have been. So, I pulled the pallets a couple of thousandths closer (that changed the entrance drops) and then reset the exit drop (by moving the adjustable cock) and the old beast really put out the action! Timekeeping has been in the seconds-a-week category. That would receive a 7 in the CC21 Assessment with ease if that were scored today.

The mainsprings were a bit sticky but were just recleaned, regreased and back to service they went. I did notice that the clicks had loosened a bit more than I would have liked but they were still holding. I took a piece of 0.005" brass shim stock, placed it between the click and the wheel spoke (to maintain the clearance), turned the wheel over onto a staking stump and peened the rivet back solidly. I'm not quite sure where or when I learned this trick but it's an excellent one to keep clicks from hurting customer's hands.

Some of the lever work faces were not as cared for as I like to do now, so I buffed out the remaining ruts, gave

them a bit of a polish and back into service they went. Now, I use a wire bender or adjuster (I have a series of these with different size slots) to adjust my levers. I didn't leave any pliers marks but the opportunity for that to happen while using a pair of pliers is too great and those adjusters are an excellent addition to the clockmakers tool compliment. Now too, I try to set all actions for ease of operation so the levers aren't lifted too high (causes more rutting of the levers) and I try to set all levers to land in the exact middle of their notches or cutouts.

The case? Well, I have learned much. I'm only sorry my mother could not have seen what her clock looked like with the case completely cleaned off and the original black shine that looks like marble. The engraving came almost completely clean of its muck and the gilding was still present. This clock was called the "Rankin" model and was made by the E.N. Welch Company from 1901-2 before Sessions bought it out, then Sessions continued to make the model from 1903 until 1921. It must have been a real popular model to have lasted that long in the line. From the dial, this one looks like it was from the 1915-21 period as it is similar to Session's dials of that period. The back I had made was not right at all! Instead of being one solid piece (like I had made it), it had a lower bout that had a beveled upper edge to hold the upper back in place when the latch was turned to hold it closed. So, I went back and cut the lower bout, with its proper bevel, from the back I had made, set it to the bottom with nails (cut nails hold the best especially when these lower bouts were nailed on, to begin with) and reset the back as original. Just to make it look more original, I used some rotten stone powder to rough up the black enamel coating and give it an old, dusty but cleaned up look. (I was very careful to remove any remaining dust as that could get into bearings and tear them up quickly!)

Now the case and the movement are as close to original as I could make them with what I had at the start. I made sure the bottom was solid as well, as nothing kills a gong faster than a loose bottom. So, now the entire clock really looks great, keeps excellent time and sounds like a million. Best of all—it's ready for the next generation to enjoy! To complete the S&P requirements, my last challenge is to get the clock to my brother who lives in the eastern side of the USA and then teach him and his wife how to care for it so they can enjoy it as much as our mother did.

Clock breaker? Well, not really, but equipment, time and experience did help refine what I was doing and how efficiently I did it! As I look back at what I would do to a clock back then, I would not want to try to make a living doing it that way. Taking 4 weeks to do the job would result in bankruptcy for sure! Today it takes me about 3-4 hours to complete a job like this. Even though I could never make a living at the old rates, the best part is I still have as much fun as I did back then! That's why I'm still doing it after 30 years. It's nice to know that I wasn't a clock breaker even back then, but it takes an S&P to give you a yardstick to know your growth. How does your work stack up?

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Jones County Junior College (L to R): Beverly Messemore, Assistant Dean of Career and Technical Education; Elbert Lewis, Horology Instructor; and Kevin Bolton, student and fund recipient.

The Harold J. and Marie Borneman Greenwood Memorial Fund of the New Hampshire Charitable Foundation was set up to assist watchmaking students.

The Harold J. and Marie Borneman Greenwood Memorial Fund is maintained by the New Hampshire Foundation. The Foundation distributes the interest earned by the fund annually to the AWCI ELM Charitable Trust. The ELM Trust distributes the fund equally to the schools/students that meet the directives given in Article IV, Section 4 of the ELM Trust Bylaws. The recommendation, made by the REC instructor, may be based on financial need or exemplary student achievement as determined by the instructor.

The 2008 recipients of The Harold J. and Marie Borneman Greenwood Memorial Fund are: Will Harbison, Lititz Watch Technicum, Lititz, PA; Kevin Bolton, Jones County Junior College, Ellisville, MS; Judd Jennerjahn, Okmulgee Institute of Technology, Okmulgee, OK; Chadwick Townzen, Gem City College, Quincy, IL; and Zan Simunovic, North Seattle Community College Watch Technology Institute, Seattle, WA.



Okmulgee Institute of Technology (L to R): Judd Jennerjahn, student and fund recipient; Wit Jarochowski and Jason Ziegenbein, Instructors of Watchmaking and Microtechnology.



Gem City College (L to R): Jim Hush, Horology Instructor; and Chadwick Townzen, student and fund recipient.



North Seattle Community College Watch Technology Institute (L to R): Zan Simunovic, student and fund recipient, and Erik Gresseth, Horology Instructor.

Tweaking Robert Porter's Pivot Drill Sharpening Fixture

By Dale LaDue, CMW

Robert Porter, a past president of AWCI, has designed a drill sharpener for tiny drills to be made from 1/8 inch round drill rod. I immediately embraced the simplicity and precision of the fixture, and wanted to incorporate my drill holders into his design. Currently, I use 3/16 inch square brass tubing and 5/32 inch round brass rod. The tubing is pinched inward on its sides, which provides a snug slip fit over the rod. The rod is drilled at one end to hold a short length of 1/32 inch carbide rod, which has a drill blank ground on its end. The brass rod is drilled and tapped for a 0/80 screw that when tightened locks the carbide rod in place. The square tube provides exact 180° references for pivot drill sharpening on a support such as a table rest or the lathe T-rest.



Figure 1. The screws in the fixture will eliminate any wobble when tightened properly.

Mr. Porter's fixture is an aluminum rod that has been drilled on its end to fit over a steel post that is press fit into a plate. The plate is clamped to the lathe bed. The aluminum rod is drilled through at 90° to fit a 1/8 inch section of drill rod that has a drill blank ground or turned to size on its end. The upper end of the fixture is drilled and tapped for a thumb screw, which locks the drill rod in place. A collar that is clamped onto the drill rod has index marks enabling proper angles for creating and sharpening tiny drills.

The smallest carbide drills I make are in the 0.5 mm and smaller range. Proper geometry and tolerances are the goals when producing these drills.



Figure 2. A hole was drilled in the fixture that will allow the square to rotate.

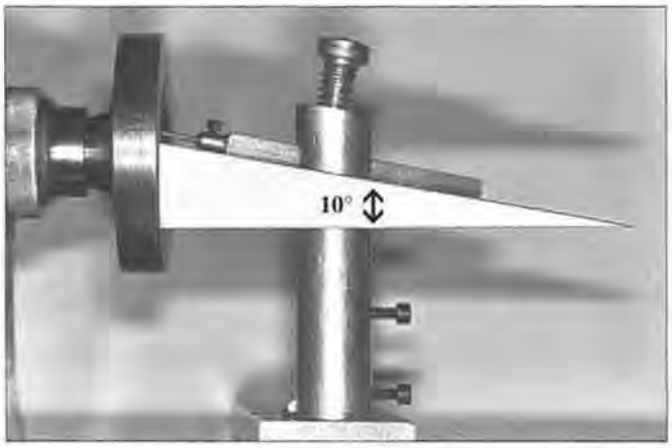


Figure 3. The hole holding the square was drilled at a 10° angle creating a relief angle on the drill point.

Two sets of holes were drilled and tapped 90° from each other into the fixture. This allows screws to reduce the clearance between the post and the fixture. When the screws are tightened properly, the fixture will rotate on the post freely without any wobble whatsoever (Figure 1). The screws are locked in place with Locktite® or a prick punch.

In order to incorporate my square drill holders into Mr. Porter's design, a drill was selected that was slightly larger than the diagonal measurement of the square holder. This allows the square to rotate in the hole as shown in Figure 2. The hole was drilled at a 10° angle creating the proper relief angle when shaping and sharpening the carbide pivot drill (Figure 3). A hole was then drilled at a 90° angle to the 10° hole and tapped for a thumb screw. Tightening this screw locks the square drill holder in place. Figure 4 shows an Allen wrench resting across the top of the square simply indicating that the square is level when locked. The drill holder can be indexed 90° and locked in place.

A stop was crafted that keeps the drill holder an equal distance from the diamond lap at each indexed position. Music wire and a section of square tube with round brass



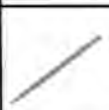
Figure 4. The thumb screw locks the square holder in any of four 90° positions.

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epoxied inside were made as shown in Figures 5 and 6. The stop can be slid along the wire and locked in place by the screw. Figure 7 demonstrates how the stop functions. A hole was drilled in the fixture to fit the music wire at the same 10° angle. Another hole was drilled perpendicular and tapped for a locking screw. The stop keeps the carbide drill blank the same distance from the diamond lap, which will assure equal angles between index positions.



Figure 5. View of the adjustable stop.

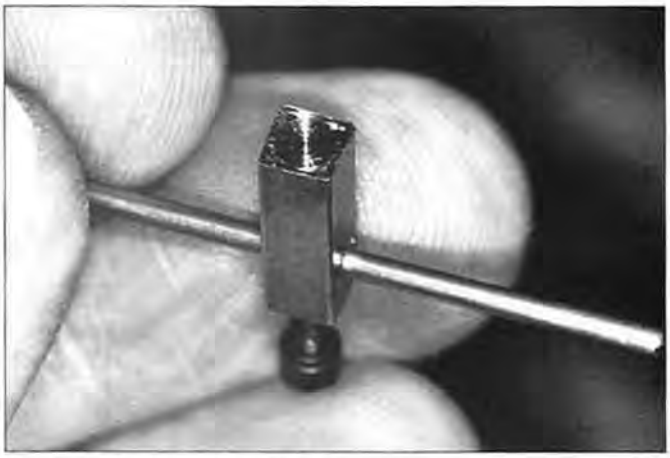


Figure 6. Another view of the adjustable stop.

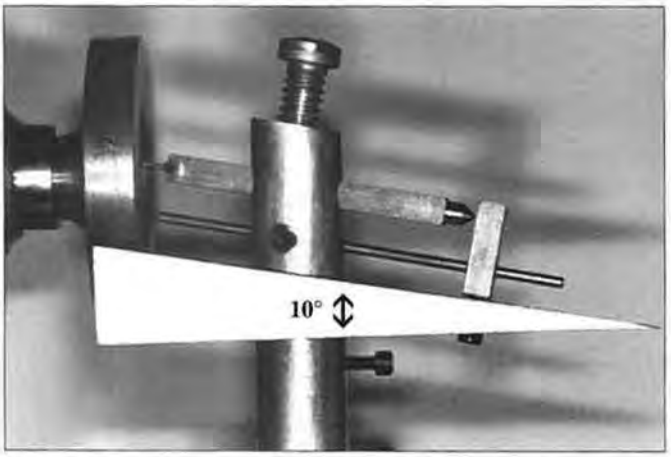


Figure 7. The stop mechanism mirrors the 10° angle. The thumb screw is 90° to the square holder.



Figure 8. A close-up of the drill geometry.

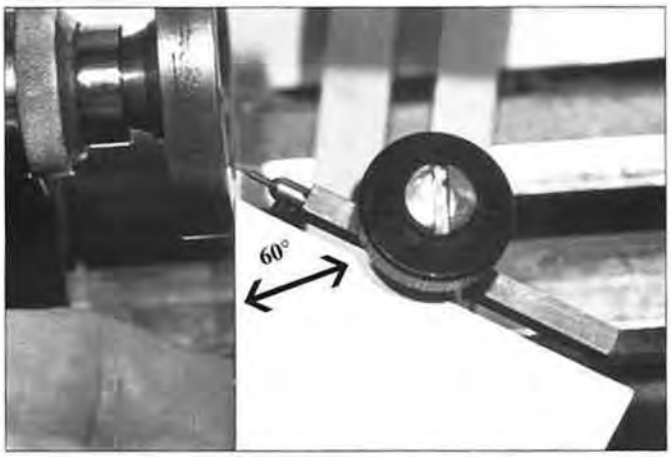


Figure 9. A drill is presented to the wheel for sharpening at a 60° angle.

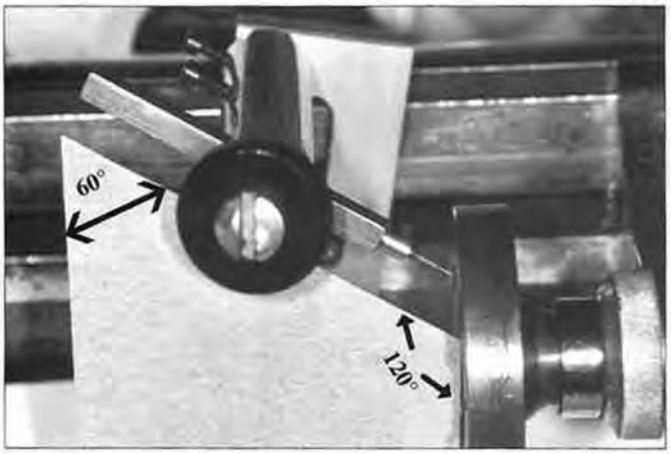


Figure 10. Another view of a drill presented to the wheel for sharpening at a 60° angle.

The opposing sides of the pivot drill are created by carefully presenting the drill blank to the diamond lap at a very narrow angle. One side is ground and then the square is unlocked and rotated 180° before the other side is ground. One of the long tapered sides is highlighted in Figure 8.

Figures 9 and 10 show a drill blank being sharpened at a 60° angle creating a point of 120°. Relief is created simultaneously because of the 10° angle as shown in Figure 11. The 60° reference lines are scribed on the base plate that is clamped 90° to the lathe bed in order to align the drill holder quickly to the proper angle (Figure 12).

I'd like to thank Bob Porter for his well planned original design.



Figure 11. A close-up of the 10° relief angle.

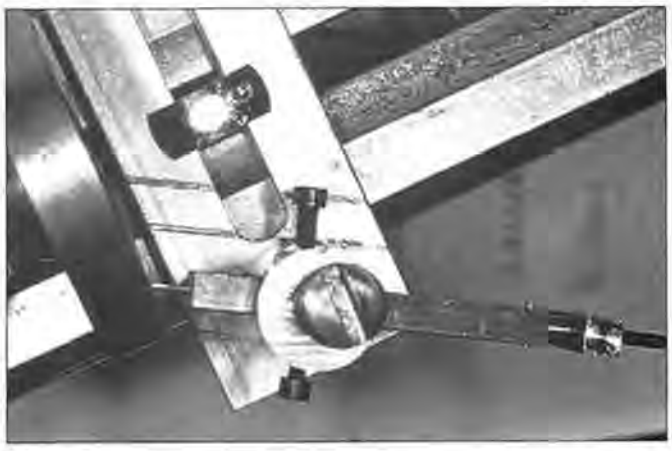


Figure 12. The 60° reference lines scribed on the base allow quick alignment of the fixture.

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Estimating Pocket Watches

By Philip Stoller, CW, CMEW

When I was new in the trade, working for "Mark's Pretty Good Jewelry Store", I learned by observation the take-in and estimating procedure used for pocket watches. The customer would lay the watch on the counter and proclaim the woes of it not keeping time, not running or similar complaints. Then my boss, Mark, would take it, open the back and give it a little twist to see if the balance would swing smoothly, indicating if the staff was in running condition. If the balance swung smoothly, he would say something like "You know, most of the time it's just an issue of it needing a good cleaning (which costs $xxx)." The price was almost always agreeable to the customer, so with the giving of their name and phone number, Mark and his watchmaker were obligated to the job.

A few years later when I opened my own shop to the public, knowing no other method, I adopted this way of estimating. My first customer brought in a nice 21 jewel railroad grade pocket watch which I received enthusiastically and confidently gave my estimate. So casual was my glance over the watch that I didn't see the shattered 3rd wheel jewel nor suspect the pivot would be worn to a nice thin hourglass shape. Needless to say, I soon recognized my estimating method must change. What followed next was the evolution of my estimating procedures that began with this watch!

Most pocket watches date from the 1940s or before. They have seen many years of use and have passed through the hands of many repairers, both competent and marginal. The work that needs to be done to a watch comes not only from normal use but often also from the bench of some "botchmaker" who was either trying to help the customer save money or get the watch to just run enough to get his money. In either case, this makes future work more difficult at the least or more demanding at the best! Many of these issues lay deeper within the movement and case and aren't as easily detected by the smooth swing of a balance.

The beginning of a competent and professional repair is to properly identify what exactly needs to be repaired. After as many years of use and abuse that pocket watches have seen, it's all the more important to thoroughly examine a watch prior to giving an estimate. The questions I ask and notes I have made, I hope will trigger your thoughts to catch more problems and render a better product with better profits by knowing from the start where you must go.

First, study the general condition of the case. Are there telltale dents around the edge that say this watch has been dropped? Will the case back and bezel smoothly thread on and off the case? If a hunter case, does the front close completely and evenly? Does it stay closed? Is the cover lip worn where the case spring holds/catches it? Is the crystal glass or plastic; or is it even there? Often when the crystal is plastic (and yellowed), the hands are rusty. Do they need replacing? Are any hands missing or unmatched? Are there major cracks or chips in the (enamel) dial? Are they extensive enough to offer a repair, touch-up or a replacement dial? If the dial is metal, is it discolored to the point that an offer could be made to refinish it? Is the crown worn and need replacing? A common complaint by the customer when a new mainspring is installed in the watch is it will seem tight or hard to wind. This is because of the worn crown. Is the bow secure enough that I would feel safe pushing and pulling this watch out of a jeans pocket? Open up the back. Have the case screws completely eaten away their portion of the case? Is the movement securely held in the case? With the movement taken out of the case, quickly check the stem and sleeve. Is the sleeve broken? Is it easy to pull the crown out to set or wind the watch?

Now with the movement in hand, keep the check list going. Are all the dial screws there? Always, always remove the dial when estimating. The first time you discover a dial screw rusted in place, you'll be glad you discovered it during the estimate and not after. Are the dial feet all there and in good condition? Is the seconds bit securely in place? Are there any rusty winding or setting parts? Occasionally, I've had Swiss watches with a tooth or two broken off the minute wheel.

Take out the balance. Is the staff in good condition? Are there broken or bent pivots? Is the hairspring in good condition? Are either of the balance jewels broken? Look closely at the hairspring collet. Some recommend checking the engagement of the pallet with the roller before

taking the balance out of the watch. This is difficult to do to any satisfactory degree with a soiled full plate watch. Instead, I will check to see if the position of the fork during total lock is even on either side of the balance jewel hole. With a little power on the train, check the engagement of the pallet with the escape wheel. Are the drops, locks, and even the total locks the way they should be? Note the positions of the banking pins. Note the overall condition of the pallet and stones.

Let down the power and further disassemble the watch, checking the pivots and holes/jewels. Check all the pivot surfaces. If they're coated with old oil, use Rodico® to clean them up a bit. Are any of them worn: lightly, extensively, or like an hourglass? Is the extended 4th wheel pivot in good condition? Is it straight? Are there any cracked jewels? In 7, 9 or 15 jewel watches are any of the holes worn and not round in shape, requiring bushing? Take a clean smoothing broach and insert it in the pivot hole to be checked. Look at the light patterns around the broach. Are they uniform? Is there more light showing through on one side? This is a quick way to see if there is any wear and where it is.

In the barrel, is the mainspring steel or alloy? I personally change out all steel mainsprings with alloy mainsprings. If you don't, is the existing mainspring "set" or is there still sufficient power there? Lastly as I disassemble the watch, note the screws. Are they original or can they reasonably pass for original? Are any blued when they should be white; white when they should be blued; rusted extensively; or missing?

This is what I found in a watch that I estimated earlier in the day when I started writing this article. While it seems like a repeat of everything I already stated, this is not an unusual case when it comes to antique pocket watches.

Elgin 15 jewel

Clean, oil and adjust	Mainspring
Re-staff	1 train jewel
Crystal (glass)	Hr/Min/Sec hands
1 dial screw,	Dial refinish (optional)
2 dial feet repair	

This shows that there was more than just a clean and oil as you can see!

There are many who would think complete disassembly of a watch just to estimate it is nuts, but I find that the customer will appreciate a detailed itemized list of what their watch needs. Yes, there is time involved; time to estimate and time to reassemble should the customer opt to not have the watch repaired. However, I also find that they will be more likely to have it repaired, perhaps feeling assured by the thought that there's less a chance for surprises and additional charges. And we all know that the customer isn't the only one who doesn't like surprises. It is always harder to call a customer after the estimate and say you found three more items that need work. What if they (the customer) then reject the work at this point?

Taking the time to estimate a watch like I've described raises the question of charging for estimates. Ultimately it's up to you the technician and business owner to decide for yourself how to handle this. I myself believe it's fair to accept compensation for time and request such when the recommended service to the watch is refused; however, this is made known to the customer when the watch is initially taken in.

About the Author

Philip Stoller attended AWCI's Academy of Watchmaking in its first year (96-97), graduating with the CW & CMEW certificates. His business consists primarily of pocket watch repairs and small parts making. Learn more about him on his website www.pstollerwatchmaker.com. Currently Philip lives in Phoenix, AZ.

Your thoughts and feedback are appreciated at pstollercw@yahoo.com

CLOCKS magazine



Based on our acclaimed series of articles for the horological newcomer, the *Beginner's Guide to Clock Repair* has now been published as a 64-page, A5, full-colour book.

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Choosing and Using a Lathe

Part 4

By Laurie Penman

Let me now talk about tools, turning and boring. This will involve tool materials, chuck speeds, and feeds. The last is not all that important for clockmaking purposes, because we rarely have a sufficient length of turning to make the use of the feed convenient—or safe. Safe? If a pivot is 0.1" long, the slightest mistake in disengaging the feed mechanism results in the tool plowing into the arbor shoulder, suddenly changing a cut of 0.020" to five times that much.

Feeding the tool involves traversing the saddle of the lathe, which carries the cross slide and tool post, by means of engaging a lead screw. Figure 29 is a view of the apron (the front of the sliding saddle), the hand wheel, rack (under the slide bed) and the lead screw. When traversing the tool by hand the black hand wheel is used. This rotates a compound gear inside the apron that, in turn, engages the rack that runs the length of the bed. The compound gear allows a relatively large rotation of the wheel for a movement of the saddle along the bed; it also gives the operator a mechanical advantage over the machine. (When traversing with the hand wheel always have two hands on the wheel so that one hand is still turning it when the other has to move to a fresh grip. This gives a smooth cutting action and avoids ridges from having the tool point "dwell" in a particular spot before resuming the traverse.)

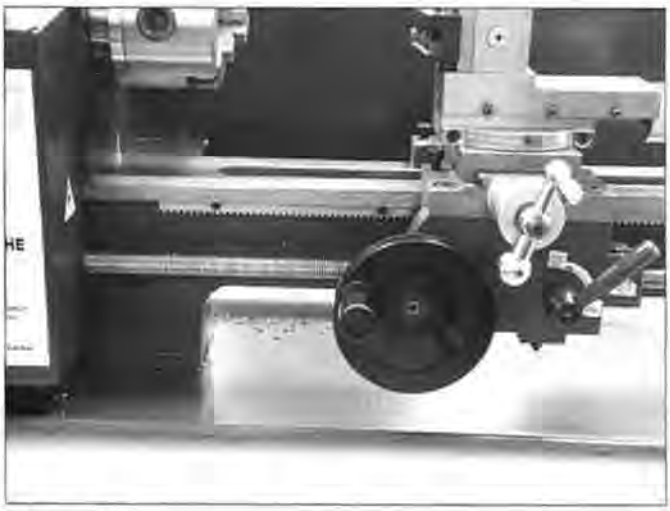


Figure 29

The gears that can be seen in Figure 30 connect the end of the lathe mandrel to the end of the lead screw, so that both rotate at the same time. The gearing produces different speeds of rotation for chuck and lead screw and this is the key to obtaining a required feed or screw thread. The drawing in Figure 31 names the parts. Notice that there is a tumbler gear that can reverse the motion of the lead screw, so that left-hand threads can be cut and the tool fed away from the chuck (left-hand turning). At the rear of the machine and barely visible in the photograph is a lever, which changes the motion to the cluster of gears from low to high speed.

Thread cutting is really no more (if the tool setting is ignored) than coarse feeding. Both move the tool along the work but feed is a much slower progression and, of course, is intended to produce a finely turned cylinder, (finely turned is relative to the obvious coarseness of thread cutting). I replaced the cover for Figure 32 and you can see



Figure 30

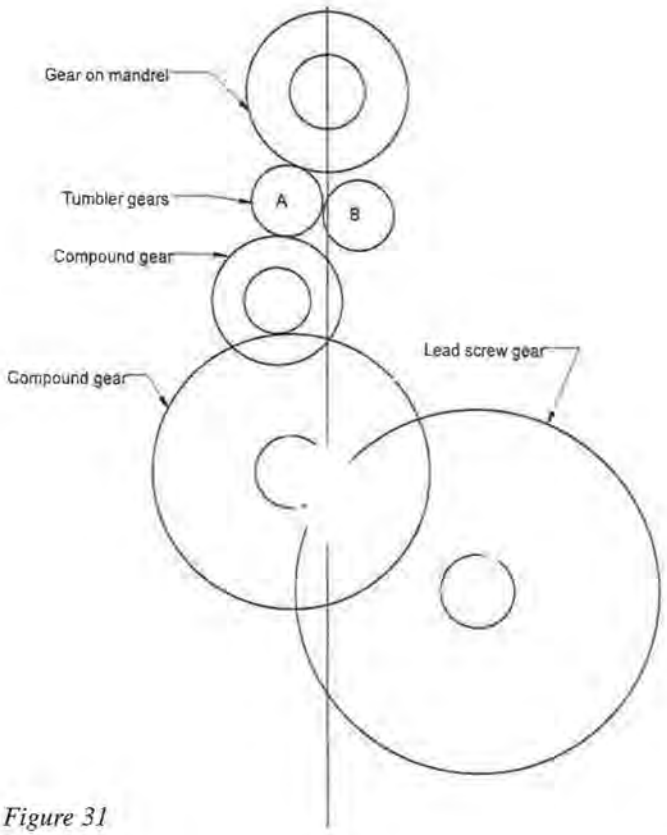


Figure 31

that there is a table showing the screw threads and feeds that are available and which gears to install in which places, to obtain them. This is a considerable help, as an apprentice I was given an old (late 19th century) lathe and a box of assorted gears, many of which fitted the lathe, and told to "get on with it". Life is simpler now or apprentice schools less brutal.

To fully understand the workings of a gear train and the ratios that a choice of gear counts will give the desired result, there are a few points to note.

The threads per inch of the lead screw must be known or measured (lead screws come in both inch and metric measurements).

Only a few gears affect the overall ratio of the train, the first and the last and any compounded gears where one member of the couple is driven and the other is driving.

Any other gears are for transferring the movement from one end of the train to the other (spanning the distance between the chuck and the lead screw), or reversing, or disengaging the output. In the case shown there are two compound gears, but it is perfectly possible that either of these could have a compound of similar counts (two gears of the same count on the same spindle), in which case they have no effect on the overall ratio. They become transfer gears.



Figure 32

Counting *all* the teeth in a gear train is not necessary (the gears are usually marked anyway), only count first and last and the compounded gears.

The ratio between the chuck and the lead screw is discovered by using the standard engineering tag "Drivers over Driven," which means that a series of fractions are laid out as a multiplication where all the figures above the line represent the counts of the gears that are driving, and those below are the gears that are being driven.

Here is an example:

Gear on mandrel	Driver	50t
Tumbler gear	Transfer only	
1st Compound gear large	Driven	60t
1st Compound gear small	Driver	24t
2nd Compound gear large	Driven	72t
2nd Compound gear small	Driver	24t
Lead screw gear	Driven	100t

Note that it is a coincidence that both large compounded gears are driven. They could be arranged differently on the common spindles, with the large gear at the front and a smaller one (not as small as the one shown) at the back. Or, as I said before, both wheels could have the same count and be merely transfer gears with no effect on the ratio.

The sum looks like this:

$$\frac{50 \times 24 \times 24}{60 \times 72 \times 100} = \frac{1}{15}$$

This means that the chuck will rotate 15 times for each revolution of the lead screw.

If the lead screw has 5 teeth per inch (tpi), the saddle and the tool will advance 1/75" for every turn of the chuck.

This is much too fine to be considered a screw thread. It is a "feed" of 0.0133" per revolution and suitable for a roughing cut. To reduce the inches per revolution it is necessary to increase the count of the compounded driven gears and/or reduce the count of the compounded drivers.

If a screw thread of 10 tpi is required, the ratio is adjusted so that the lead screw rotates twice for every one of the chuck. In this case that could be effected by having the lead screw gear twice the count of the mandrel gear and all the others used as transfer gears only.

That was simple, but if a screw thread of 18 tpi is required then a pencil and paper is needed, or reference made to the table on the gearbox cover. Notice that for several of the threads quoted, the transfer gears are reduced to one. This is because they are mounted on swiveling plates or in slots so that the gap between the active members of the train can be bridged with fewer gears than shown in the example.

Feeds and Speeds

Most of the turning that we carry out in clockmaking requires short traverses that can be made easily by hand and at speeds that are suitable for high speed steel (HSS) tools. The revolutions of the chuck per minute are not critical either. However, there are occasions when large diameters have to be dealt with and tougher materials than rolled brass and annealed high carbon steel machined. This lathe is large enough to cope with jig and tool making for clockmaking and model making, so let me explain the requirements of different materials and tools other than plain HSS.

Speeds have to be calculated since they refer to the surface speed of the material at the tool point, simply quoting revolutions per minute (rpm) is no good because the speed varies with the diameter of the work piece. In addition many lathes do not have readout for rpm. If the gearing for the headstock is the only means of altering the speed, then the rpm can be read from the chart provided for each of the configurations of wheels. When stepless speed variation is provided electronically, the speed has to be judged from what is known to be the maximum speed and the position of the control knob, and the response of the tool.

Regardless of what the tool is made of (tungsten carbide, ceramic, HSS, etc.), if the work is rotating too fast, the chips will come off very hot and discolored. Steel will be amber, blue, silver blue or even red; brass will take on a dark gold and in either case if there is oil or grease present, there will be smoke. All these are strong indications that the speed is too fast, or the feed is too great, or both. This is assuming that the point of the tool is in good condition.

To check the feed, the saddle is disengaged from the lead screw and the tool fed by hand. If the work is still being cut too fast the chuck speed is dropped, of course.

SPEEDS

		Tool Material	
Material		**HSS**	**TC**
Low carbon steel	ft/min	115	500
Medium carbon steel	ft/min	90	350
High carbon steel	ft/min	80	350
Free-cutting brass	ft/min	328	623
Leaded bronze	ft/min	300	600
Aluminum	ft/min	500	1100

Calculating speed in rpm is a simple matter of multiplying the circumference at the working surface (in feet) and dividing that into the quoted feet/minute. For example a 1" diameter bar of medium carbon steel and a HSS tool requires a speed of 90 ft/min.

The circumference is 1 x 3.142 = 3.14 inches
which translates into 0.262 foot
90 ft/min divided by 0.262 = 343.5 rpm
Choose a speed between 300 rpm and 400 rpm

There is a useful piece of software that calculates speeds and rpm for you, rendering the speeds in rpm for any diameter of work you specify. It has a limited range of materials, though. It is "Machinist's Calculator" available on a thirty-day trial (purchase price $35 after trial) at www.machinist-calculator.com. It is a nice easy program to get familiar with.

	TOOL MATERIAL			
	High-Speed Steel		Tungsten Carbide	
Material	**Roughing**	**Finishing**	**Roughing**	**Finishing**
Low Carbon Steel	0.010 to 0.020	0.002 to 0.008	0.008 to 0.035	0.006 to 0.010
Med. Carbon Steel	0.008 to 0.018	0.002 to 0.008	0.008 to 0.030	0.006 to 0.010
High Carbon Steel	0.008 to 0.015	0.002 to 0.008	0.008 to 0.030	0.006 to 0.010
Free-cutting Brass	0.010 to 0.025	0.003 to 0.010	0.010 to 0.040	0.008 to 0.012
Bronze	0.015 to 0.025	0.003 to 0.010	0.010 to 0.040	0.008 to 0.012
Aluminum	0.015 to 0.030	0.003 to 0.012	0.015 to 0.045	0.008 to 0.012

Feed in inches/revolution of chuck

Executive Director's Message

(Continued from page 3.)

Again, let's take a very conservative look at how many WS, WT, and CAs we could add to the AWCI membership. There are 40,000 retail members of the JBT (Jewelers Board of Trade). These are the individuals who will be looking to hire WS, WT, and CAs. If 10% of JBT members hire one of these, AWCI's membership would increase by 4,000 over time. This is where I see our growth and future coming from.

We will always need to offer fresh affinity programs (various insurances, website, credit card processing, etc.) for our membership. These will change with the times. They usually don't cost the association anything, and sometimes we make a small amount from them depending on the success of the individual program.

I think we have accomplished a lot in the last 7 to 9 years, since the first Strategic Plan was formulated and implemented. I look forward to the success of this revised/updated plan.

AWCI Correspondence Course in Clock Repair

Based on the original correspondence course written and administered by Laurie Penman, AWCI's resident clock instructor, this course is constructed to provide information and instruction in a manner that is immediately useful in both learning and practicing clock repair. The course contains 16 lessons. At the completion of each lesson you will receive comments and suggestions from Laurie Penman, and a pass or fail grade. Those who achieve a pass grade in each section will receive a certificate of completion. Mr. Penman will be available to answer questions or offer suggestions to each student.

The AWCI Correspondence Course in Clock Repair package contains all the material and information necessary to successfully learn the fundamentals of clock repair, including *The Clock Repairer's Handbook* by Laurie Penman and a one-year subscription to Steven G. Conover's monthly publication, *Clockmaker's Newsletter*. Course participants will be invited to attend a 2-day meeting at AWCI to confer with Mr. Penman and meet other students.

AWCI Members - $800
Non-members - $925

Contact Nancy Wellmann, AWCI Education Coordinator
E-mail: nwellmann@awci.com
Phone Toll Free 1-866-367-2924, ext. 303

AWCI Member Websites

- **Have you always wanted a website for your business, or are you unhappy with your current website?**
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Mainsprings and Cells

Consider what would happen if one day you awoke and learned that replacement mainsprings for watches were no longer available. What if your supplier of spare parts told you replacement watch cells were discontinued? What would you do? How would you respond to these two situations? You do not need to wait any longer to consider your response to both situations. One has occurred and the other is on its way.

There is one principal manufacturer of replacement mainsprings in all of Switzerland. This writer has often conjectured in private conversations his thoughts about mainspring availability if the Swiss mainspring factory had a major disaster such as a fire. Since there is no other source for quality mainsprings, the result could be devastating for watchmakers who depend upon a reliable source for replacement mainsprings. Although there was no fire at the factory, something else has occurred that will seriously affect the watch repair industry, both here and abroad. We have received notice, in early June 2008, from several American distributors of spare parts, that the management of the mainspring factory has suddenly, and without prior notice, decided to discontinue the manufacture of replacement mainsprings for American watches. Additionally the manufacturer has also discontinued the manufacture of numerous mainsprings for older Swiss watches. According to one American distributor, the manufacturer's accountants studied the actual costs involved in manufacturing replacement mainsprings in the customary small runs of 100 pieces. (At one time in the not too distant past they would actually fill orders of a few dozen pieces of one size.) It was determined that these small lots were not at all profitable and, in fact, were actually lowering the overall profitability of the factory. Simply put, the accountants advised the management to reduce the number of products made, limit the mainspring production to far larger runs, and consequently increase the profitability of the factory. Although it makes business sense, it is going to cause considerable discomfort to those of us who service American watches and vintage Swiss watches.

The replacement cell situation is not nearly so dire. Renata, the Swiss cell manufacturer, announced a major increase in the cost of Renata 44 cells as mentioned in this column a few months ago. Since that time, Renata decided to discontinue production of the Renata 44 cell at the end of 2008. In addition, all Energizer cells will be mercury free in the near future. This changeover will require new production lines for every cell they make. As they make the changeover to mercury free, they may discontinue some low production cells, as their low sales level may not justify the cost of setting up a new, mercury free, production line.

While the long-term results from these announcements are open to speculation, some changes have already taken place. If you have not recently purchased mainsprings, be prepared for sticker shock. American mainspring prices are now approximately three times greater than they were last month. If you have any in stock, consider immediately raising their retail price commensurately. In the case of American mainsprings, at least one importer is negotiating with the factory to continue producing some of the best selling American mainsprings on a special order basis, albeit at a substantially higher price. In the not too distant future some popular American mainsprings may still be available, but only if the negotiations with the manufacturer are successful.

Replacement mainsprings for Swiss watches have also increased in price, but not as drastically as the ones for American watches. There should be a sufficient supply of replacement mainsprings in the existing stock at the various supply houses to take care of our requirements in the near future, but the long-term outlook seems less than favorable at this time.

Although some watch cell production will be discontinued, the effects will be negligible when compared to the mainspring situation. The cells will be discontinued because we use so few of them and conversely, the watches in which they are used make up a very small percentage of the watches brought in for repair.

Jack Kurdzionak

Excessive Balance Amplitude, Next Chapter

The April 2008 column about excessive amplitude generated several comments, mostly disagreeing with one factory's recommended application of more viscous oil to the balance pivots to reduce excessive amplitude. Several members advocated fitting a weaker mainspring. The factory method cited in the article did mention mainspring replacement as the alternative if changing the balance pivot oil did not help.

A few others advocated testing the escapement locking first, especially if the watch movement was of recent production. Pallet stones, set too shallow, allow the escape wheel tip to strike the impulse surfaces of the pallet stones without securely locking. Escapements, improperly adjusted, can deliver far too much power to the balance wheel and cause excessive amplitude. In fact, as a result the watch may gain minutes or even hours per day. These members made an excellent point by suggesting that every escapement should be tested for proper locking, regardless of the age or quality of the movement. One of them noted that a recently purchased, factory-new replacement escape wheel and pallet fork for a very high-quality Swiss watch were not properly matched when fitted to the movement. The pallet stones were set too shallow causing excessive amplitude and occasional stoppage. Once the stones were adjusted, the watch ran flawlessly. This exemplifies one member's comment that watchmaking skill is still required, even when servicing a new, very high-quality watch.

As a group, the members agreed that when a watch displays excessive amplitude the following steps should be taken:

1. Test the escapement and adjust it if necessary. If the escapement is properly adjusted, go on to the next step.

2. Replace the mainspring with the next lower strength, if available. Of course, double check any replacement mainspring for correct dimensioning. Mainspring packages are sometimes mislabeled. Also, check the appropriate technical guide for the factory recommended mainspring dimensions. It is not unusual to find an incorrect mainspring previously fitted in a watch. The mainspring you find in a watch may well be the wrong one. Finally, go on to the next step if all is well with the escapement and mainspring.

3. Replace the oil in the balance jewels with Moebius HP-1300.

Jack Kurdzionak



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Some Good News

ETA now manufacturers a movement, the ETA E03.001, a 5½ x 6¾ ligne, 1.35 mm thick quartz movement that will directly replace the now discontinued ETA 281.001. This discontinued movement was found in many high-quality women's dress models. Spare parts for the 281.001 are very difficult, if not impossible, to locate. Now that ETA has the E03.001, repairing these watches is again possible. The new movement accepts the original dial and hands with no modifications. Even the stem and hour wheels are interchangeable with the 281.001.

Jack Kurdzionak

Order More, Less Often

No one needs to read the Wall Street Journal to be aware that the costs of doing business have risen sharply this year. Just buy something for your business and compare the cost to what you paid last year. Any product or service closely or even distantly related to the cost of a barrel of oil has gone up in price. Heating, cooling, transportation, and shipping are a few examples. All of us can mitigate some of the price increases if we take a few simple steps. We can lower the thermostat setting in the winter and raise it in the summer. We can limit our driving miles and slow down. Those steps will save a few dollars. Perhaps we have already done that. Can we squeeze a few extra dollars out of the spare parts budget this year? Yes we can, if we listen to some advice from our spare parts distributors. Any one of them will tell us that many customers, and that means us, order spare parts in small lots and order too frequently. Is there really any need to make a daily spare parts order? Is it not possible to accumulate a much larger order and order once per week or once every 7-10 days? A $10 part plus $5 shipping and handling immediately becomes a $15 part. That is a 50% price increase. Order a $10 part ten times and the S&H is now $50. It makes better sense to accumulate a much larger order of small parts so that the order is now $100 with a shipping charge of, perhaps, $7.50 or 7.5% of the total cost. The unspent balance of $42.50 will be available to use for something else, such as a pay raise for the watchmaker.

Jack Kurdzionak

You Are Invited

Do you have a solution to a watch or clock repair problem that you want to share with our membership? Do you have a question about a repair problem you would like to ask? I invite you to participate in this column with your suggestions, questions, and comments. It is easy. Just e-mail me at AWCI magazine@awci.com or write using the old standby known as the postal service. You can even fax me at 513-367-1414.

I will do my best to help you help the membership. By sharing your questions and suggestions, all of our members can benefit from our combined knowledge and experience. The ideas, tools, techniques and products presented in this column are suggested by the author and contributing members and are not endorsed by any manufacturer, supplier, advertiser or AWCI itself.

PARTS MESSAGE BOARD

The American Watchmakers-Clockmakers Institute **Parts Message Board** is available on line at **www.awci.com** Click on the Parts Forum in the Top Links box. Guests are free to browse our topics and posts but only validated AWCI members will be able to actively post messages and communicate with one another via private messaging.

The purpose of this board is to aid our members in finding watch parts, clock parts and tools. This board is not open to generic advertising posts; therefore, web addresses and e-mail addresses should not be included in public messages.

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Thomas Schomaker, CMW21 Instructor

AWCI is offering a series of 5-day watchmaking classes. Each 5-day block will cost $600. There is a $100 non-refundable fee charged at the time of registration. This fee will be applied to the full class fee. For additional information, contact Education Coordinator, Nancy Wellmann nwellmann@awci.com or call 1-866-FOR-AWCI (367-2924), ext. 303. Class information is also available online www.awci.com

September 8-12, 2008	Vintage Chronographs - Bernhard Stoeber, Instructor
September 15-19, 2008	Balance Staffing & Timing **FULL**
September 22-26, 2008	Modern Automatic Watches **FULL**
October 6-10, 2008	Basic Quartz Watch and Quartz Chronograph Repair **FULL**
October 13-17, 2008	Modern Mechanical Chronographs, Servicing & Adjusting **FULL**
November 3-7, 2008	Modern Mechanical Chronographs, Servicing & Adjusting **FULL**
January 5-9, 2009	Watchmaker's Lathe I **FULL**
January 12-16, 2009	Watchmaker's Lathe II
February 2-6, 2009	Basic Watch Repair
February 9-13, 2009	Servicing & Adjusting the Lever Escapement **FULL**
March 2-6, 2009	Modern Automatic Watches
March 16-20, 2009	Modern Mechanical Chronographs, Servicing & Adjusting **FULL**
April 20-24, 2009	Basic Quartz Watch and Quartz Chronograph Repair **FULL**
June 8-12, 2009	Watchmaker's Lathe I **FULL**
June 15-19, 2009	Watchmaker's Lathe II **FULL**
July 13-17, 2009	Basic Watch Repair
Aug. 31-Sept. 4, 2009	Balance Staffing & Timing
September 21-25, 2009	Modern Automatic Watches
October 5-9, 2009	Basic Quartz Watch and Quartz Chronograph Repair
October 19-23, 2009	Modern Mechanical Chronographs, Servicing & Adjusting
November 9-13, 2009	Modern Mechanical Chronographs, Servicing & Adjusting

21st Century Certified Watchmakers Exam Schedule

Visit AWCI's website for complete information on the 21st Century Certified Watchmakers Exam. To register for an exam or for more information contact Nancy Wellmann, Education Coordinator, at nwellmann@awci.com or call toll free 1-866-FOR-AWCI (367-2924), ext. 303.

August 11-14, 2008	North Seattle Community College	Seattle, WA **FULL**
September 2-5, 2008	Lititz Watch Technicum	Lititz, PA **FULL**
October 27-30, 2008	AWCI Training Facility	Harrison, OH **FULL**
November 10-13, 2008	AWCI Training Facility	Harrison, OH **FULL**
January 26-29, 2009	AWCI Training Facility	Harrison, OH
February 23-26, 2009	AWCI Training Facility	Harrison, OH
March 30-April 2, 2009	AWCI Training Facility	Harrison, OH
April 27-30, 2009	AWCI Training Facility	Harrison, OH
June 23-26, 2009	AWCI Training Facility	Harrison, OH
July 20-23, 2009	AWCI Training Facility	Harrison, OH
September 8-11, 2009	Lititz Watch Technicum	Lititz, PA
October 26-29, 2009	AWCI Training Facility	Harrison, OH
TBA	North Seattle Community College	Seattle, WA

21st Century Certified Clockmakers Exam Support Classes

Laurie Penman Instructor

AWCI is offering a series of 5-day clockmaking classes to support the 21st Century Certified Clockmakers Exam. Each 5-day block will cost $600. There is a $100 non-refundable fee charged at the time of registration. This fee will be applied to the full class fee. For additional information, contact Education Coordinator, Nancy Wellmann nwellmann@awci.com or call 1-866-FOR-AWCI (367-2924), ext. 303. Complete class information is also available online www.awci.com

August 4-8, 2008	Advanced Machining Techniques
August 18-22, 2008	Recoil Pallet Repairs
September 8-12, 2008	Deadbeat Pallet Repairs
September 15-19, 2008	Servicing Modern and Antique Time & Strike Movements
Sept. 29-Oct. 3, 2008	Servicing an American Time & Strike Movement
October 13-17, 2008	Servicing the 400-Day Clock and Using Electronic Timers
October 27-31, 2008	Servicing the Modern Cuckoo Clock with Music Box
November 10-14, 2008	Servicing the Modern Westminster Chime Movement

21st Century Certified Clockmaker Exam Support Class

Deadbeat Pallet Repairs

September 8-12, 2008 — Harrison, Ohio
Laurie Penman, Instructor

DESCRIPTION
The deadbeat escapement (Brocot, Graham and pinwheel) is found in many clocks, and generally they are the better class of movement. This is a five-day class and includes the making of Brocot pallets and a solid Graham anchor for the Seth Thomas Regulator #2. The making of a set of pallets for a Vulliamy escapement will be described, but there is not time to actually make one.

PREREQUISITE
Knowledge of the use of hand tools, familiarity with lathes and drilling machines, and machine tool safety.

COURSE OUTLINE
For a complete course outline and tool list visit
www.awci.com/services/continue-edu.php

Servicing Modern and Antique Time & Strike Movements

September 15-19, 2008 — Harrison, Ohio
Laurie Penman, Instructor

DESCRIPTION
Time & strike clocks simply strike the hours and, in most modern ones, the half hour. Modern (from about 1970) striking clocks generally employ the rack striking system. This class will look at the general repair of the movements and specifically study front work for T & S, examining them for the most common defects and wear points. Antique clocks make use of both rack striking and count systems.

PREREQUISITE
Knowledge of the use of hand tools, experience of dismantling clock movements, familiarity with lathes and drilling machines, and machine tool safety.

COURSE OUTLINE
For a complete course outline and tool list visit
www.awci.com/services/continue-edu.php

Class fee is $600. There is a $100 non-refundable fee charged at the time of registration. This fee will be applied to the full class fee. For additional information, contact Education Coordinator, Nancy Wellmann nwellmann@awci.com or call 1-866-FOR-AWCI (367-2924), ext. 303

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October 24 - 25 - 26



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Friday, October 24
9:00 AM - 5:00 PM
Chronograph 7750 Service, Repair and Adjusting, Tom Schomaker, CMW21
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Hospitality room for drinks and snacks
Auction 7:30

Saturday, October 25
9:00 AM - 5:00 PM
Chronograph 7750 Service, Repair and Adjusting, Tom Schomaker, CMW21
Display room
"Gala Under the Stars" - Doug Maggard's Bar B-Q, Entertainment and Dancing

Sunday, October 26
10:00 AM - 12:00 Noon
Brunch and Meeting
Keynote Speaker Tom Schomaker, CMW21

Chronograph 7750 Service, Repair and Adjusting
Instructor Tom Schomaker, CMW21
AWCI Watchmaking Instructor/Certification Coordinator

This hands-on course on the Chronograph 7750 will cover in-depth service methods, cleaning, oiling, timing, and adjustments. This is not a class for beginners; you must have at least 3 years experience and must have taken the oiling or basic watch repair class to participate. Tool list provided after your registrations is received.

Class Price: **$295** by October 1, 2008; at the door or after October 1, 2008 - **$350**
Lunch and gratuity is included; does not include membership dues or other convention functions

Convention registration price is **$125** and includes all food, drinks, entertainment, etc.
$50 discount for class participants - you must be a paid member of FWCA

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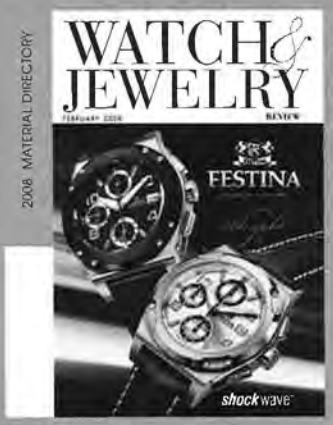


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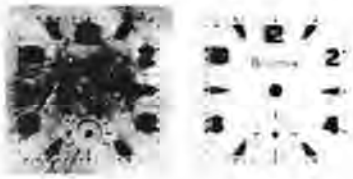
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364	SR621SW	0.20	0.22	0.18	0.20		
364 20pk	SR621SW	0.19	0.21	-	-		
364 MF	0% Hg			~~0.25~~	~~0.28~~		
365	SR1116W	0.69	0.73				
366	SR1116SW	0.65	0.69	-	-		
370	SR920W	0.34	0.38	0.30	0.34		
371	SR920SW	0.31	0.35	0.28	0.32		
373	SR916SW	0.48	0.52	0.45	0.49		
376	SR626W	0.28	0.30	0.25	0.27		
377	SR626SW	0.21	0.25	0.18	0.22		
377 20pk	SR626SW	0.20	0.24	-	-		
377 MF	0% Hg			~~0.25~~	~~0.28~~		
379	SR521SW	0.31	0.35	0.28	0.32		
381	SR1120SW	0.41	0.45	0.38	0.42		
384	SR41SW	0.29	0.33	-	-		
386	SR43W	0.47	0.49	-	-		
387S*		1.33	1.35				
389	SR1130W	0.41	0.43	-	-		
390	SR1130SW	0.42	0.46	-	-		
391	SR1120W	0.37	0.40	0.36	0.39		
392	SR41W	0.26	0.29	0.21	0.23		
393	SR48W	0.42	0.44	-	-		
394	SR936SW	0.45	0.47	-	-		
395	SR927SW	0.31	0.35	0.29	0.33		
396	SR726W	0.36	0.40	-	-		
397	SR726SW	0.34	0.36	0.32	0.34		
399	SR927W	0.34	0.36	0.32	0.34		
						Amount Sub-total.....	

SPRON - Mercury Free - 0% Hg cells are made by Seiko Instruments, Inc.

For silver oxide cells - Circle the price to denote the brand desired for each model

All of the above silver oxide batteries are made in Japan, 387S is Energizer USA.

Lithium Coin, Alkaline and Zinc Air					
		Tear Strip Card		ORDER	TOTAL
BRAND	MODEL	100 + PCS	5-49 PCS	QUANTITY	AMOUNT
generic	CR927*	0.65	0.69		
Max or Pan	CR1025*	0.65	0.69		
SONY	CR1216	0.65	0.69		
SONY	CR1220	0.65	0.69		
Pan	BR1225*	0.75	0.79		
Pan	CR1612*	2.25	3.25		
Seiko Part	CR1612		14.95		
SONY	CR1616	0.60	0.64		
SONY	CR1620	0.65	0.70		
Pan	CR1632*	0.81	0.85		
Pan or Ener	CR2012*	0.70	0.74		
SONY	CR2016	0.45	0.50		
SONY	CR2025	0.46	0.50		
SONY	CR2032	0.46	0.50		
Ren	CR2320*	0.72	0.76		
Pan	BR2325*	0.91	0.95		
Pan	CR2330*	1.01	1.05		
ROV	CR2335*	1.96	2.00		
Pan	CR2354*	1.75	1.95		
Pan	CR2412*	2.75	2.95		
Seiko Part	CR2412*		14.95		
Sony	CR2430	0.90	0.95		
Sony	CR2450	1.00	1.10		
Sony	CR2477	2.35	2.50		
Pan	CR3032*	2.40	2.95		
Pan	CR1220*	0.52	0.55		
Pan	CR1620*	0.61	0.66		
Sony	LR41 - 192	0.22	0.26		
Sony	LR43 - 186	0.22	0.26		
Sony	LR44 - A76	0.22	0.26		
Sony	LR1120 - 191	0.22	0.26		
Sony	LR1130 - 189	0.22	0.26		
Alkaline Button 10 pcs/ca		100 + PCS	10 - 90 pcs		
Maxell	LR41 - 192*	0.18	0.20		
Maxell	LR43 - 186*	0.18	0.20		
Maxell	LR44 - A76*	0.18	0.20		
Maxell	LR1120 - 191*	0.18	0.20		
Maxell	LR1130 - 189*	0.18	0.20		
	* Denotes Generic Tear Strip Packaging				
Renata 2V Lithium		Unit			
Ren	333	19.95			
Ren	751	42.95			
Ren	44	39.95			
Zinc Air	Rayovac	Energizer	Duracell		
	60 pcs/carton	40 pcs/ctn	40 pcs/ctn		
Size10	26.95	15.95	17.95		
Size13	26.95	15.95	17.95		
Size 312	26.95	15.95	17.95		
Size 675	26.95	15.95	26.95/60pcs		
Size 5	29.95				
				Amount Sub-total.....	

Select Shipping Preference (circle)	
First Class Mail (min. $1.95)	Fedex/UPS Ground (min. $7.95)
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EMS 1-2 Day (min. $18.95)	Fedex/UPS 3 Day Air (min. $12.95)
Other:	Fedex/UPS Next Day (min. 20.95)

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Fax Number: _____

Payment Information

Credit Card: AMEX, VISA, MC, DISC (circle one.)
Name on Card: _____
Card No.: _____
Expiry Date: _____

Signature: _____
(Include billing address of card if different from shipping address).
Billing Address: _____
City, State, Zip: _____
___ Check here if you want your credit card kept on file for future orders.

Micropower Battery Company: 80 NE 13 Street, Miami, FL 33132 (All orders ship from Miami, FL). Tel. 800-680-CELL (2355), Fax 305-371-9400, Email help@microbattery.com

Maxell Guarantees Authenticity.

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Smaller Card Size Fits Popular Watch Battery Storage Systems

Batteries that are counterfeit or otherwise not factory authorized for distribution have become an epidemic. Their performance does not meet exacting factory standards. They lack reliability. And they ruin the trust between buyers and sellers. That's why Maxell has developed holographic battery packaging that guarantees authenticity. Extremely difficult to copy, this packaging ensures peak performance and reliability you can expect from genuine, factory-authorized Maxell batteries. Accept no substitute.

CONTACT SALVATORE LUNELLI AT SLUNELLI@MAXELL.COM FOR MORE INFORMATION.

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