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ADVANCING THE ART, SCIENCE & BUSINESS OF HOROLOGY

October 2013



AMERICAN WATCHMAKERS-CLOCKMAKERS INSTITUTE

Herman Mayer: Modern Mechanical Chronograph 7750
Edmond Capt: A Man of Record
reprinted from *WatchTime* magazine
Student paper: Magnetic Indexing of the Minute Counting Wheel
Robert Little: Refurbishing and reinstallation of The Village of Glouster Clock, Part 2

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COVER IMAGE:

Joe Defilippo examines a student's work on the 7750 during the August 2013 Modern Mechanical Chronograph class.

Photo by Herman Mayer

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a message from the president

MANUEL YAZIJIAN, CMW21



Manuel Yazijian
myazijian@gmail.com

Dear AWCI Members,

Election results having come in, I would like to welcome the following directors: First-time runner Drew Zimmerman, past President Joseph Cerullo, and current Vice President Wesley Grau, who was also Affiliate Chapter Chairman for the past two years and currently serves as our Chief Examiner. Welcome, gentlemen. I am confident you will work in unity within the Board of Directors in an unselfish manner to better the profession of watchmakers and clockmakers.

To the members who ran but did not win (David Douglas, John Safranek, Terry Curkan, Justin Shiver, and Michael Michaels), please try again next year. We value your input and your participation in our organization.

As a reminder to all members, the first step to running for the board is to join a committee and participate in projects so we can get to know you better, and also that you may give back a little to the profession.

Part of our ongoing improvement within AWCI is the continued success of our courses, taught at headquarters in Harrison, Ohio. The team of instructors from Lititz Watch Technicum, of Lititz, Pennsylvania, Herman Mayer and Joseph DeFilippo, are doing an outstanding job in providing world class education to our members and garnering many accolades from students.

The following comments are from one of the participants of the course, Rob Gamber.

"The 7750 course I took on August 26-30 was a pleasant surprise. I was ready for a nose to the grindstone all week with no down time. Herman and Joe did an outstanding job with the teaching of this course. The first day was a little stressful since we were in a new location with a bunch of people we did not know, but Joe and Herman made us feel right at home in no time. Our day started at 8 a.m. and ended at 6:30 to 7 p.m. every day but Thursday, when some of us were there from 6:30 a.m. to 6:30 pm. We were running out of time in the week to cover all the aspects of the 7750, so Joe and Herman recommended that we start early to cover the pallet stone adjustments. I'm glad they did. I learned more than I was expecting to."

I invite other industry members to take advantage of our state-of-the-art facility to teach courses. We welcome you to teach brand/caliber-specific courses, or to teach the various courses currently being offered, or to offer new topics that would benefit the horology community.

Looking forward to seeing you all in class.

As always, keep your skills honed, your standards very high, your attitude professional, your tools and equipment in great condition, and your workshops clean and organized; it is a reflection of who we are and what we do.

education & certification



We are pleased to announce some exciting new changes coming soon to our education programs at AWCI. Several of our scheduled courses will be taught by visiting instructors from the Lititz Watch Technicum.

Attention Clockmakers! Your questions have been answered. Coming soon! Courses for watchmakers and clockmakers will be bridged ranging from basic tool and spare parts making to vintage chronograph! Specific courses require special know-how. Utilizing brand-specific tools will be made available to participants.

Here's an example of an upcoming bridged course:

Basic Tool and Spare Parts Making Courses 1-3.
Participants: 10 students maximum
Length of course: 4 days each

Course 1 would be a basic course, and Course 2 would be an intermediate course. Each built around developing and mastering essential micro-mechanic proficiencies. Each course is based on reconstructing a clock movement to a functional level. Course 3 teaches traditional micro-mechanics for watchmakers and/or clockmakers. It would be an advanced capstone course which requires the theoretical and practical knowledge of the proficiencies taught in Courses 1 and 2.

Content:

- Beveling
- Blueprints
- Broaching
- Burnishing
- Centricity
- Clamping
- Connection Techniques
- Cutting Geometry
- Deburring
- Drilling
- Filing
- Grinding
- Hazardous Materials
- Hole Alignment/Center Distance
- Lathes
- Lubrication
- Materials
- Measurement
- Metalworking
- Punches
- Reaming
- Safety
- Sawing
- Surface Finishing
- Thermal Treatment
- Tools
- Tracing
- Turning

I urge you to attend AWCI courses in our state-of-the-art facility. The experience and knowledge gained will be well worth the time spent away from your workshop. This is a prime opportunity to receive hands-on instruction from some of the best educators in the industry!

More information on class schedules can be found on our website as well as your email inboxes.

AWCI ACADEMY OF WATCHMAKING 2013 COURSES

OCTOBER

Servicing & Adjusting the Lever Escapement
October 15-18 | 5 CEUs

The purpose of this course is:

- To gain a good theoretical understanding in order to evaluate the condition of the lever escapement and thus proceed with the verification and analysis of the escapement functions.
- To teach the student all the fundamentals of the proper functioning of the lever escapement.
- To be able to make all the adjustments with ease and confidence.
- To understand the effects of adjustments on timing.
- Proper lubrication methods and its effect on timing and overall performance.

Prerequisites:

- Minimum 3 years full time experience in watch repair
  - (and/or) Having attended the following AWCI Courses:
    - Basic Watch Repair and/or
    - Automatic Watch Repair
- Ownership of the book The Theory of Horology is essential.
  - **Must read pages 99-101 of *The Theory of Horology*, prior to attending the course.**
  - Knowledge of watch & escapement terminology
- Membership with AWCI
- Ownership of hand tools as per tool list.

Length of course: 40 hours, 4 days

More specifically, the student will learn about:

- Overview of the nomenclature of the lever escapement and its various components
- General repair procedure
- Checking the various components
- Adjustment & correction of the division of the escape wheel, the lever & balance wheel
- Adjustment & correction of the clearance of the fork horns & guard pin
- Adjustment & correction of the various clearances in the escapement
- Adjustment & correction of the pallet jewels
- Logical steps of repairing the lever escapement
- Proper technique of applying shellac
- Oiling the escapement
- Final assembly
- Timing adjustments and analysis

NOVEMBER

Polishing & Refinishing
November 11-15 | 5 CEUs

Polishing a watch today requires many skills. Today's consumer has high expectations concerning the quality of the watch repair, including the refinishing of the case and bracelet. Knowledge is the key.

class covers:

- Casing information
- Case and bracelet refinishing
- Metallurgy
- Lathe finishes
- Use of modern variable speed polishers
- Modern polishing techniques ensuring case shape integrity
- Water resistant testing

This course is designed to help you realize:

- A higher quality of service
- reduced come-backs due to moisture issues
- faster turnaround time
- higher customer satisfaction

For additional details about specific courses in comprehensive syllabi form, including complete tool list, visit: http://www.awci.com/education-certification/education2/list-of-continuing-education-courses/ or contact Cindy Whitehead at 866-FOR-AWCI (367-2924), ext. 303

Prerequisites: Must be able to stand for long periods of time. Operate machinery safely. Use a lathe.

Length of course: 5 days (Monday – Friday)

Topics and Areas of Study

- Identifying the content
- Knowledge of the Hallmarks
- Pre-cleaning procedures
- Polishing procedures
- Use of modern water resistant testers
- Crystal/Bezel removal and principals of a case press
- Taping and protecting the sealing surface
- Texturing finishes
- Speed and direction related issues
- Preparation and maintenance of the polishing wheels and buffs

More specifically:

Knowledge of water resistant principles will be taught. Disassembly and assembly of case components and the use of a crystal press and dies will be explained. Procedures related to water testing, including the "condensation test" will be demonstrated on a wide variety of modern, currently produced testers. Techniques demonstrated during this program will cross over to many other brands.

The Polishing Supply Kit includes the following:

1. Felt wheel
2. Buffs
3. Satin wheels
4. Set of compounds
5. Brass fixture for case back
6. Felt bezel fixture
7. Safety glasses and safety mask
8. Abrasives, emery stick, sandpaper
9. Specialty items
10. And more

Know Your Member Benefits!

AWCI strives to not only encourage the advancement of horology but provide educational and technical services to our members.

For over 50 years, we've dedicated ourselves to preserving and promoting the highest standards of workmanship in the horological crafts.

Our goal is always to maintain a standard of excellence applied to the quality of instruction for both the restoration and repair practices that are taught worldwide. As our valued members, make sure you take advantage of all the benefits AWCI membership offers:

- ***Horological Times* Magazine**
  ***Horological Times* Magazine, a valuable source for industry news, technical information and business-building articles for our industry.**
- **Special member rate for all Horology education and certification**
  AWCI conducts training through Continuing Education courses in Harrison, OH and Off-Site Bench Courses.
- **FREE Referral Directory listing**
  The AWCI Member Referral Directory helps connect consumers with watchmakers and clockmakers.
- **10% Discount on all AWCI products including books, DVDs and other merchandise**
  Members receive discounted prices on horological books, DVDs and more.
- **Full AWCI Technical Discussion & Parts Forum access**
  Members gain full access to the Forum on AWCI.com including the ability to post and communicate with other professionals via private messaging.
- **Full access to the online AWCI Career Center**
  The Career Center connects job seekers with employers. Job seekers can post resumes or view available jobs.
- **Use of the Henry B. Fried Library – checkouts of books and periodicals in person or by mail**
  New and vintage horology texts and periodicals are available on loan for AWCI members at no charge.
- **Technical Assistance**
  Members may request technical bulletins and schematics at no charge or parts lists for watches and clocks via our research assistance network.

We continuously work to offer the most valuable services and assistance possible because we appreciate all our members.
Visit AWCI.com to renew your membership. Or, call toll free:
1-866-367-2924 Ext. 301.

Modern Mechanical Chronograph 7750

HERMAN MAYER

The ETA caliber 7750 is one of the most prevalent mechanical chronograph movements in service today. It is found in a wide product range that is commonly serviced both at the retail store level and by independent watchmakers. Its rock-solid and streamlined design makes it very service friendly and it therefore enjoys a strong popularity amongst watchmaking professionals.

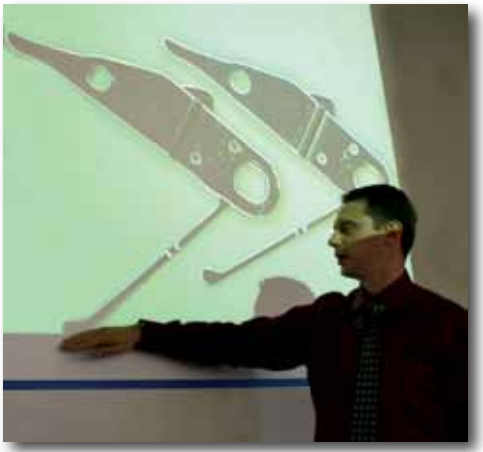
Several major brands offer specific training for their retail service accounts; however there is also a strong demand for continued education seminars on this movement—like the Modern Chronograph seminar recently given last month by Joe Defilippo at the AWCI headquarters in Harrison, Ohio.

What Is the Profile of Participants in These Courses?

First of all, numbers are critical. Watchmaking education is intense and requires a low student-to-teacher ratio. Up to 10:1 is ideal, with 12:1 being the limit, especially when dealing with a varied group. This is often the case in continued education seminars where participants typically come with a wide variety of personal and professional backgrounds.

And indeed, our group of 10 students was quite diverse. Some of them learned the profession at watchmaking schools, some in an apprenticeship. Several students had around 40 years' experience, some less than 10. The cumulative experience of the group added up to 267 years, with an average of slightly below 27 years of experience.





As varied as the group was, they had one thing in common: all were watchmaking professionals who recognize the value of continued education in getting ready to tackle the opportunities that come with an increased demand in servicing complicated watches.

A chronograph with an hour counter, automatic winding and day/date indication is a complex mechanism, and the complete *comprehension* of it is essential for efficient troubleshooting. Without *fully understanding* the mechanism that is before us on our bench, the quality and efficiency of our work becomes compromised when guesswork replaces logical action.

Since all of the participants were experienced watchmakers, there was no need to begin with a disassembly/reassembly exercise. Instead, we started with a caliber 7750 movement completely disassembled with all the parts mixed up. The primary goal was to work ourselves through the movement, in a practical way, as well as conceptually, by following the various power transmission chains. Therefore, the barrel was chosen as the starting point of our journey through the 7750 since it stores the power provided via the automatic system and supplies it through various trains to the oscillator, the hands (including chronograph hands) and day/date indicators.

Barrel Service and Diagnostics

For a course that was titled "Modern Mechanical Chronograph" the start was mundane: Barrel Service and Diagnostics. What appeared to be an extremely simple topic gained complexity as we discussed components such as the sliding bridle (is it sliding along the barrel wall?), wear patterns and their symptoms (including mainspring damage and wear), the purpose of the mainspring S-curve (what is its purpose and how does it fulfill it?), various kinds of barrel lid designs and the correct way to open them, whether the endshake of the barrel between the bridge and the main plate has an influence on the performance on the going train (it doesn't—because the arbor is not even rotating when the watch is running).

A Man of Record



One of the world's most important caliber-designers: Edmond Capt directs both the Frédéric Piguet and Lemania *manufactures.*

The Village of Glouster Clock Project, Part 2

ROBERT LITTLE, CC, CW

In Part 1 of The Village of Glouster Clock Project, Bob Little explained how he removed the 107-year-old clock from its post in the Glouster Depot and took it back to his shop to refurbish it. Here he completes his explanation of his refurbishing process and tells how the clock was reinstalled on its pole in the village and unveiled during a dedication ceremony.

In the clock restoration process, the new dials have been fabricated and the movements have been slightly modified and mounted to the aluminum U-channel clock mount that I had fabricated. The movement has been aligned with both dials. The next step will be to complete the movement control installation and wiring.

I next fabricated the control panel. The entire unit is mounted within the clock behind the door, and is fastened with 1/4"- 20 flathead bolts. I used one of the unused movement box backs, fabricated a 1/8" aluminum mounting plate for the two preassembled movement control switches and pilot lights, and then attached the plate to the box back. See Figure 2.1. The seams were sealed with the RTV sealant. I made a second easily removable lower control panel and attached it to the lower part of the panel with two pan-head sheet metal screws. This smaller panel holds the main power switch, the light's power switch, and the wiring connector strip. I made this with easy removal in mind, so it can be lifted up and out of the way, and the 5/8" x 2" base-mounting bolts are easily accessible.



Fig. 2.1

With the motor mount and control panel done, I made a wiring harness. See Figure 2.2. I used flexible 16-gauge copper wiring throughout, and I soldered, capped with wire nuts, and then taped all connections. I installed UL-rated insulated push connectors on the motor wiring and sealed them with "liquid tape." See Figure 2.3. Everything was now wired, including the wiring for the photocell to control the bezel lights, and the lighting wiring itself. I installed the photocell in the lower part of the case near the control panel and drilled a 3/4" hole in the case for the photocell body, which was slightly greater than 5/8". I fitted two O-rings on the cell body for a snug fit, coated it with RTV sealant, and pressed the body in place. See Figure 2.4. I installed the optic end of the photocell slightly below flush and screened the original weep holes in the clock body near the photocell to prevent bug entry.

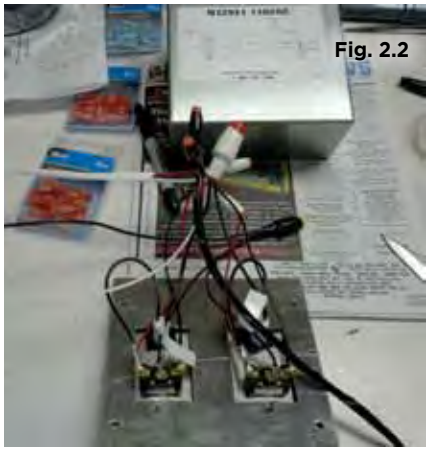

Fig. 2.2


Fig. 2.3



Fig. 2.4

Next, I fabricated the bezels using dimensions from the old ones. From what the local residents stated, the clock has always had wooden bezels. The latest ones were shaped redwood boards nailed together. They failed because the small finish nails rusted away, and the wood deteriorated and just fell apart. I seriously considered fabricating them from aluminum, but I went with the wood as per their request. I decided to use 3/4" rot-resistant exterior plywood and cut the front and back of each bezel out of a solid piece so there would be no exposed seams to fail. The interior piece was made out of four 90° sections joined with biscuits and premium exterior wood glue. See Figure 2.5. All circular pieces were individually precision cut with a 3-hp, variable-speed router and circle-cutting jig. See Figure 2.6.

Independent Accountant's Report

BURKE & SCHINDLER

CERTIFIED PUBLIC ACCOUNTANTS

INDEPENDENT ACCOUNTANT'S REPORT
ON APPLYING AGREED-UPON PROCEDURES

Board of Directors
American Watchmakers – Clockmakers Institute
Harrison, Ohio

We have performed the procedures enumerated below, which were agreed to by American Watchmakers – Clockmakers Institute, solely to assist you with respect to the ballot tabulation and related matters of American Watchmakers – Clockmakers Institute for the 2013 election of Board of Directors. American Watchmakers – Clockmakers Institute management is responsible for the company's ballot tabulation process and related matters. This agreed-upon procedures engagement was conducted in accordance with attestation standards established by the American Institute of Certified Public Accountants. The sufficiency of these procedures is solely the responsibility of those parties specified in the report. Consequently, we make no representation regarding the sufficiency of the procedures described below either for the purpose for which this report has been requested or for any other purpose.

Our procedures and findings are as follows:

1. Obtain a listing of both the Domestic and Foreign American Watchmakers – Clockmakers Institute members in which ballots are to be mailed. The listing should include names and addresses of all members.

   Result:
   We obtained the listing of both the Domestic and Foreign American Watchmakers – Clockmakers Institute members in which ballots were to be mailed from Bueke Printing & Mailing. We noted all member names had a corresponding address except Ronald Pfleger and John Shorts.

2. Verify the number of members in total for both the Domestic and Foreign listing obtained in #1 above is one thousand seven hundred seventy three (1,773).

   Results:
   We verified the number of members in total for both the Domestic and Foreign listing obtained in #1 above is one thousand seven hundred seventy three (1,773).

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