



## American Watchmakers – Clockmakers Institute

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**To: Candidates for Assessment for 21<sup>st</sup> Century Certified Watchmaker Certification**

**From: James Lubic, CMW21  
Executive Director**

**Wesley Grau, CMW21  
Chief Examiner**

Fellow Horologist:

We are very pleased that you have chosen to achieve Certified Watchmaker 21<sup>st</sup> Century status through the official AWCI assessment process.

We have prepared an excellent assessment. It is reflective of the modern world of horology, and has been used quite effectively over the past few years. Industry has given its approval on this examination by making it part of the requirements for receipt of parts account approval.

Successful completion of the performance and written requirements of this assessment will enable you not only to verify to the world that you have the requisite skills to perform as a modern horologist, but will also open other important doors to you.

Please study this document carefully. We compiled this document to help you prepare for your exam. It contains suggestions on how to approach the process and gives information on suggested ready as well as tools and the timeline of the exam itself. You may contact our office by phone (1-866-367-2924) or email Daniela Ott, the Education Coordinator, at [dott@awci.com](mailto:dott@awci.com) if you have any question regarding the journey you are about to begin.

We wish you the best and will do the best we can to help you along the way.

## WHAT IS ON THE AWCI CW21 EXAM?

The CW21 Exam is a 5 (five) part exam:

1. **Written/Theory** Essay questions, calculations, etc. (English **ONLY**)
2. **Micromechanical** Use of the lathe, hand-held graver turning operations
3. **Quartz Watch** Servicing modern Swiss wrist watch movement
4. **Automatic Watch** Servicing modern Swiss wrist watch movement
5. **Chronograph Watch** Servicing modern Swiss wrist watch movement

Familiarize yourself with the AWCI Standards and Practices. You can find the most updated version on the internet at [www.awci.com](http://www.awci.com) under "Services" > "Education" > "Certification". Emphasis on the CW21 Exam is on pages 10-20.

## HOW TO PREPARE FOR THE CW21 EXAM

The suggestions below are merely that, suggestions. You should always prepare for an exam in the manner most comfortable to you. Observations of examinees over the years have helped develop this list. It is offered only as a guideline to help you prepare for your exam.

### **Before the Exam**

1. Study, study, study and practice, practice, practice. Reading the relevant pages in the Standards & Practices document (pages 10-20) will help you determine in which area you might need help/practice or even take a refresher course. Do not make the mistake of thinking that this exam is easy, it will test your limits and having been a watchmaker for 20 years does not guarantee you will pass the exam. You will not only be graded on what you know, but on what the current industry standards are and if they are applied correctly in your work.
2. Get organized. Plan ahead. Do NOT rush into this exam. You have made the first step and requested the application forms, and you are reading this document. Find out when the classes are you might wish to take and sign up for them. After taking the classes you might want to give yourself some time to practice what you have learned to become more confident. You will be able to apply what you have learned in your every day repairs, but you might want to make sure you have some timepieces on hand so you can practice specific repairs. Also keep in mind, that you need to be signed up for the exam thirty (30) prior to the first day of the exam, which means your application, affidavit, payment in full, variance form and picture have to be at AWCI in order to be registered for the exam.
3. Take care of customers' jobs way ahead of the exam. Do not do last minute jobs prior to attending the exam. We know your time is valuable, but coming into the exam with your mind on problems or work that didn't get finished will add to your stress and while it might not be entirely avoidable, try to minimize it as much as possible.

4. Have your tools prepared, sharpen screwdrivers, tweezers etc. Read and understand the tool list provided below. Remember that you might want to ship them ahead if you are flying and give them time enough to arrive here before your exam starts. Address them to:

YOUR NAME  
C/O AWCI  
701 Enterprise Drive  
Harrison, OH 45013

They will be waiting for you in their box on the first morning of the exam in the class room ready to be set up. Please make sure you have YOUR name on it for identification.

5. Arrive at the exam site the day before you start your test. This gives you sufficient time to settle yourself in your hotel room, and acclimate yourself to your new surroundings. It will also give you some time to recover from the jet lag you may experience if you have traveled a long distance. You might even want to take a drive to the actual exam location so you know where it is and how long it takes to get there eliminating the need to search for it the morning of the exam. Do your best to get a good night's rest. Plan your return travel for late on the last day of the exam or even the next day. You do not want to have to rush on the last day of the exam. It will add to the stress of finishing up your tasks and that will cause mistakes and other problems. Plan to give yourself extra time before traveling home.
6. Make sure you bring comfortable clothes. Avoid wearing tight fitting clothes or tight fitting ties etc. during the exam, this might not allow you to perform as well. You are not being graded on what you wear, but we suggest you bring your lab coat to keep a professional appearance and protect your clothes from chemicals.

## **Suggested Study Guide for CW21 Exam**

Please find some of the reference material below:

- ✓ ETASWISSL@B can be found at [www.eta.ch](http://www.eta.ch) under the "Training" tab.
- ✓ Take part in AWCI preparatory courses. Find the schedule at [www.awci.com](http://www.awci.com) under "Services" > "Education" > "Continuing Education"
- ✓ *21<sup>st</sup> Century Watchmaker Behavior, Practices and CW Certification*, by Manuel Yazijian, CMW21 (DVD), available in the AWCI online store.

A suggested book list:

- ✓ *Watchmaker Standards and Practices* (PDF file)
- ✓ *Theory of Horology*, Reymondin, et al.
- ✓ *The Modern Watchmaker's Lathe and How to Use it*, Archie Perkins
- ✓ *Watch Repair Manual*, Henry Fried
- ✓ *Repairing Quartz Watches*, Henry Fried, AWCI Library (on loan only)

## Tool List

### Tools:

AWCI will provide cleaning machines and solutions. Hand-tools should be provided by the student. Lathes, staking tools, poising tools and truing calipers etc will be available, but candidates should provide their own wherever possible. Ownership of quality hand tools is an expectation of a **Certified Watchmaker**. The brand names mentioned below are used to help you identify the tools from the most popular tool catalogs; you are welcome to choose a brand of your choice, as long as it is of **equal or better quality**. You will notice that in some instances, we have listed more than one type of tool below – this indicates you may bring the tool of your preference.

**SR:** Strictly Required

**R:** Required

**O:** Optional

SUGGESTED TOOL LIST						
Description	Bergeon	OTHER BRANDS	SR	R	O	
1. Acrylic square block, 15mm x 50mm x 50mm (prepared by candidate in advance)	hand made project				X	
2. Apertured brass plate for balance 35 mm	30106			X		
3. Arkansas slip (triangular or square) 85mm x 7 mm (apprx.)			X			
4. Barrel Arbor Holder (slide locking jaws) [a.k.a. sliding pin vise]	30610 Diam. 1.50		X			
5. Barrel Arbor Holder (slide locking jaws) [a.k.a. sliding pin vise]	30610 Diam. 1.00		X			
6. Barrel closing tool	hand made project				X	
7. Baskets small round, 10 x (i.e. for L&R cleaning machines)					X	
8. Benzene glass jar (small) Ø 60 mm (or smaller)					X	
9. Bench Block (anvil)			X			
10. Brush (small)	1300-6		X			
11. Brush, 3 rows, No. 4	1103-4		X			
12. Calculator	--		X			
13. Carbide gravers (if not available you may purchase blanks)			X			
14. Carbide graver blank (1/16" thick or 1.58mm) <a href="http://www.mscdirect.com">www.mscdirect.com</a>		04120077			X	
15. Carbide rod or pivot drill Ø 0.25mm to cut balance during poising			X			
16. Casing cushion			X			
17. Clear Plexiglas round stick 4 mm thick, 6" long	--		X			
18. Cloth (lint-less)		Selvyt		X		
19. Dial plastic protection	6938		X			
20. Dust-blower (rubber)		A.F.18666	X			
21. ETACHRON regulator adjusting tool			X			
22. File, rectangular, 150mm(L) x 18.5 mm(W) x 4.0mm(T)	500-1163-6				X	
23. Files (assortment of 12 escapement (small)	30421-A				X	
24. Hammer (Brass or Brass & Fiber)	30416		X			
25. Hammer (Watchmaker's)	1438-E3				X	
26. Hands fitting tool/pusher	7404		X			
27. Holder for pallet-fork	30433		X			
28. Jewelling tool		Horia/Seitz			X	
29. Knife with case opener	6403		X			
30. Leather/Chamois buff 6 mm wide (x2)	1282-D			X		
31. Lever for hairspring collets, 1.7 mm			X			

## **During the Exam**

1. Arrive at the exam location in plenty of time before the exam starts. The administrator will be at the facility early (around 7:30 a.m.) on the first day of the exam to give you time to set up your bench and familiarize yourself with the facility.
2. PAY CLOSE ATTENTION TO THE INSTRUCTIONS GIVEN TO YOU, both verbally and written. If you do not understand any of the instructions, please ask the administrator for clarification, it is very important you understand what is expected of you. Read the instructions provided to you. If you do not understand something, without disturbing your fellow candidates, quietly ask the administrator for clarification. It is important that you understand all instructions given so comprehend what you are reading and do not read just for the sake of reading it.
3. Focus on your tasks and the instructions pertaining to them. Remember, this is a very serious moment for you, do not waste time talking to other candidates during the exam, instead focus on your work. You will have time for socializing later.
4. The creatures of habit that we are, many bench watchmakers were trained to “dive into” the repair by performing complete disassembly, cleaning and reassembly - only to notice fundamental errors during or after reassembly. Learn how to find the errors in a watch prior to complete disassembly or after pre-cleaning.
5. During the hands on portion of the exam, you will get tired at some point, make it a habit to get up and stretch for a few seconds.
6. Plan your work. Some prefer to do the easy jobs first so that part is out of the way. Some prefer to begin with the most complex task so they have enough time to verify their work and continue with the easier task in between jobs, e.g. while waiting for watches to be cleaned in the cleaning machine. Multi-tasking is encouraged.
7. If you have any concerns, consult the exam administrator, he is there to help you as much as he can.

VERY IMPORTANT: This is an examination and everybody there has spent time and money to be there, be respectful of others as you wish them to respect you. Refrain from being noisy, never ever move or do anything to the tasks of another examinee and remember that you are all under stress, be patient with each other.

## **GENERAL TIMELINE OF EXAMINATION**

A full on-site examination will take place over four (4) days or thirty-two (32) hours. Partial exams will vary in length depending on the tasks taken. If taking a partial exam (re-take exam) please make sure you check with the Education Coordinator at AWCI regarding the specific days you will be taking your exam. It will either be Day 1 & 2 or Day 3 & 4, so please verify before arriving at the exam location to eliminate any confusion. Taking the exam during the scheduled 4-day time period is mandatory.

## **Day 1**

### ***7:30 a.m. – 8:00 a.m.***

Candidates will be able to select their bench and set up their tools and equipment. The Exam Administrator may assign benches and may choose to select benches for Candidates with disabilities.

### ***8:00 a.m. – 8:30 a.m.***

Prior to examination, participate in Assessor's orientation, receive all instructions, tech sheets, and be made familiar with procedures, security concerns, pertaining to written examination.

### ***8:30 a.m. – 12:00 p.m.***

Task 1: Complete Written Examination. Students who have filed a Variance Form with their application due to language or other special requirements will be given a previously set amount of extra time which will not count against them. The extra time will be made up at the administrator's discretion, but it is added to the total time allotted for the exam.

**NOTE:** Candidates who do not need to take the written exam can sign in at 1:00 p.m. for the practical portion of the exam.

### ***1:00 p.m. – 5:00 p.m.***

Briefly meet with administrator(s), receive tasks and ask any questions pertaining to the instructions and the assessment process. Work on Performance Tasks.

- Task 2: Micromechanical task as instructed
- Task 3: Full service of a modern quartz timepiece
- Task 4: Full service of a modern mechanical autowind day/date timepiece (ETA 2824-2). Examiners will explain rate expectations.
- Task 5: Full service of a modern mechanical chronograph (ETA 7750), including timing adjustments of all functions. Examiners will explain rate expectations.

## **Day 2, 3 & 4**

### ***8:00 a.m. – 12:00 p.m. and 1:00 p.m. – 5:00 p.m.***

Work on Performance Tasks.

Candidates who have earned extra time due to waiting etc., will be granted extra time with administrator's approval. Candidates not finished with tasks will be given up to two (2) hours to complete task, but will be penalized 0.5 point for each half hour segment they are over time. This applies to all components which have not been submitted and signed off by the administrator.

# NOTES TO ALL CANDIDATES

## Timing of Examination:

The 4-day schedule of tasks is mandatory. However, there is flexibility after the completion of the written examination for the performance components.

Candidates will receive all basic instructions prior to the written examination, and receive performance tasks immediately after the written examination (and lunch break). From this point on, they may multitask, and are encouraged to do so, to maximize use of time, facilities, cleaning machines, timers, etc.

## Timepieces:

All timepieces will be coded and numbered according to candidate, and the candidate must insure that the timepiece is returned to the examiner at the end of each day, unless the timepiece is unassembled, in which case the examiner will determine if the movement should be covered for continued work the following day, or cased up and returned.

## Prior Inspection of Timepieces:

Each timepiece will be given to candidates with the understanding that the timepiece may have been used as a test watch in a prior assessment and therefore may possess marks or flaws which render it less than pristine ("factory new"). Candidates will be expected to document all flaws in a preliminary inspection of their particular movements, and to present a written documentation of these flaws to the examiner, prior to beginning actual work. **This written inspection is a part of the examination**, as it demonstrates the candidate's ability to analyze components for cosmetic flaws.

## AFTER THE EXAM

Now that the exam is over you are eager to find out how well you did and the next stressful part of the exam begins – waiting. We schedule assessments of the exams at intervals of about 3 months. It would be too costly to have assessors come in for each exam session. During the assessments each task is thoroughly inspected and scrutinized to uphold the standards of the CW21 certification. Each assessor has been trained extensively and understands the responsibility they hold. They view the tasks only by their assigned numbers and do not know who has completed the task. Each assessed task has to be verified by at least two (2) assessors. The entire process is anonymous and the results of an individual exam are not combined until later, after the assessors have left, when the result letters are written or the certificates are sent out. Be assured that we all do our best to get the results/certificates to you in a timely manner.

### Sample Examination Questions:

### Sample Question: Trouble Shooting

Scenario: A consumer presents a timepiece to you that is an autowind, with calendar mechanism (day/date) claiming that it “runs down overnight on his bed stand.”

List possible problems (at least 5) you would consider in servicing the timepiece. Note: the customer is young and very active (jogs every day with the watch on). Also, a close visual inspection shows you the watch's hands are perfectly placed and aligned, not catching or rubbing.

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



### Sample Question: Nomenclature

Name the individual components of the winding and setting mechanism of a simple watch. See diagram below.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_
11. \_\_\_\_\_
12. \_\_\_\_\_

