Tick - Tock
Care for Your Clock

Connecting to Collections Care Webinar

Cathy and Greg Gorton
Gorton Clocks
January 20, 2020
Topics

Clocks and Materials
Clock Assessment
Clock Care
Should the Clock Run – Dynamic Object Concerns
When to Call a Professional
Resources
Clock Care Resources For Museum

Museum Authored Care Guides

The Henry Ford Museum Care Guides
Winterthur Collection Care Tips
The National Trust Manual of Housekeeping

Conservation Institution

FAIC C2CC – Foundation for Advancement of Conservation – Connecting to Collections Care
AIC – American Institute of Conservation
ICON – Institute of Conservation
CCI - Canadian Conservation Institute
Clock Care Resources For Museum

Horological Associations

NAWCC – National Association of Watch and Clock Collectors
BHI – British Horological Institute
AHS – Antiquarian Horological Society
AWCI – American Watchmakers - Clockmakers Institute

Clock Museums

American Clock and Watch Museum
National Watch and Clock Museum
Willard House and Clock Museum
Clock Types

- Tall Case
- Wall Clocks
- Shelf Clocks
- Tower Clocks

Willard House and Clock Museum
Identifying Clocks

Books available on Amazon or Barnes and Noble

The Clock Book, Philip E. Balcomb, 1996

Tips on Identifying and Appraising Clocks, Martha Tips, ISA, CAPP, 1991


NAWCC Library at the National Museum of Watch and Clocks – Columbia, PA
Tips on Identifying and Appraising Clocks, Tips, pg. 3

https://grandfatherclocksblog.com/key-parts-grandfather-clocks-labeled/
The Clock Book

Time Only - (Time Piece)

Time and Strike

Time, Strike and Chime

The Clock Book, Balcomb, pg. 16
Clock Mechanism Variation

Power Source – weight, spring, water, electricity…

Oscillator – pendulum, balance wheel, torsion pendulum, foliot …

Escapement – dead beat, anchor recoil, crown and verge…

Cases - Materials

**Metals** – brass, bronze, copper, gold, silver, iron, steel, nickel, chrome, zinc alloys, pewter

**Wood** – pine, walnut, oak, cherry, mahogany, rosewood

**Minerals** – marble, alabaster, stone, slate, jade, coral

**Animal** – leather, ivory, bone, tortoise shell, mother of pearl

**Plastics** – Celluloid, Bakelite, thermo plastics

**Paint** – casein, milk paint, oil paint, lead paint

**Other** – Glass, ceramic, crystal, porcelain, papier-mâché, adamantine finish
Cases - Decorations and Finishes

- Engraving of brass elements often filled with black sealing wax
- Mouldings, carvings, finials
- Clear finishes – wax, resin, oil, shellac
- Pigmented paint finishes
- Reverse painting & stenciling on glass
- Gilding
- Textiles – silk and other fabrics
Dials and Hands - Materials

- Dial Plates – Metal, wood, porcelain
- Brass, sometimes silver plated with black enamel or shellac filling
- Painted zinc dials with embossing
- Paper
- Radium paint – hazardous material
  [https://www.epa.gov/radtown/radioactivity-antiques](https://www.epa.gov/radtown/radioactivity-antiques)
- Hands – majority are steel, wood, plastic, brass, lead, pewter
Dials and Hands - Materials

- Engraving of brass elements often filled with black wax
- Aluminum, sometimes anodized to a gold color
- Copper with porcelain faces
- Glass with printing or paint
- Cast iron or cast bronze
Clock Movements

Materials

<table>
<thead>
<tr>
<th>Wood</th>
<th>Brass</th>
<th>Iron</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel</td>
<td>String</td>
<td>Silk</td>
</tr>
<tr>
<td>Paper</td>
<td>Copper</td>
<td>Leather</td>
</tr>
</tbody>
</table>
Caution – Be Aware

Current international laws/restrictions if shipping abroad even on-loan.

Unexpected materials

Lead paint (Hazardous) – typically French metal clocks circa 1700s

Pigments can be hazardous, not just lead oxides. In doubt, send sample for analysis

Radium in Antiques – EPA webpage
https://www.epa.gov/radtown/radioactivity-antiques

National Watch and Clock Museum
French clock, circa 1830’s with tortoise shell and ivory.
Mercury

Environmental Protection Agency

https://www.epa.gov/mercury

Use Caution!!!

Alternatives are available similar to the one shown from vendors like www.timesavers.com
Clock Assessment

Description
- Provenance
- Materials – Case, dial, movement, etc
- Dimensions

Photos
- Case (front, back, sides) and labels
- Keys, dials and hands
- Movement, weights, pendulums
- Special markings
Clock Assessment - Condition

Case Condition
- Decorative elements
- Damage
- Structural weaknesses
- Losses and surface markings

Movement Condition
- What works and doesn’t work
- Corrosion
- Broken
- Worn
- Missing components

Identifying replaced parts vs. original
<table>
<thead>
<tr>
<th>Inventory Number</th>
<th>Clock Type</th>
<th>Signature</th>
<th>Maker</th>
</tr>
</thead>
<tbody>
<tr>
<td>Period of Manufacture</td>
<td>Serial Number</td>
<td>Origin</td>
<td>Clock Case Dimensions</td>
</tr>
<tr>
<td>Frame or Plate Number</td>
<td>Strike/Chime</td>
<td>Pendulum</td>
<td>Weights</td>
</tr>
<tr>
<td>Movement</td>
<td>Pendulum Lock: Yes No</td>
<td>Hands</td>
<td>Dial</td>
</tr>
<tr>
<td>Moon Dial: Yes No</td>
<td>Calendar: Yes No</td>
<td></td>
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</tr>
<tr>
<td>Winding Key: Yes No</td>
<td>Crank Key: Yes No</td>
<td></td>
<td></td>
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<tr>
<td>Case Key: Yes No</td>
<td></td>
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<tr>
<td>Additional Markings: Labels, notes</td>
<td>Complications: Alarms, musical additions, etc.</td>
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<td>Pictures:</td>
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<table>
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<tr>
<th>Use letter codes for quick reference:  (C)ase  (M)ovement  (T)ime  (ST)rike  (STS)rike  Silent  (CH)ime  (CHS)ime  Silent  (AL)arm  (BR)oken  (CO)rrision  (CR)acks/splits  (D)amage  (DI)scolored  (FL)aking  (LD)ight Damage  (L)osses  (M)old  (W)eak</th>
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<tr>
<th>Case Condition:  Describe condition, note decorative elements, damage, structural weakness, losses, surface markings, not original</th>
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<tr>
<th>Movement Condition:  Describe condition noting what works, does not work, corrosion, broken, bushings, oil, missing, not original</th>
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<th>Other Comments:</th>
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<th>Assessment Performed By:</th>
<th>Date:</th>
<th>Phone:</th>
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Developed by Gorton Clocks for the Connecting to Collections Care Webinar, January 2020. Permission granted to use and disseminate as needed. [https://www.connectingtocollections.org/care-for-clocks/](https://www.connectingtocollections.org/care-for-clocks/)
Clock Damage Risks

Poor Environment
   Fluctuating temperatures
   Fluctuating humidity
   Excessive exposure to light, pests or pollution

Careless handling

Unsafe display

Improper cleaning and repair

Over-winding

Understand and minimize or eliminate conditions that cause damage
Record of Monitoring and Plan of Care

Special Care Instructions
Environment, cleaning, inspecting & moving

Winding Instructions
What and how to wind
How to stabilize the case
Key/crank location & turning direction
Weight height
What to listen for
### Record of Monitoring And Plan of Care: Clocks

<table>
<thead>
<tr>
<th>Inventory Number</th>
<th>Clock Type</th>
<th>Location</th>
<th>Record Period</th>
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<tbody>
<tr>
<td></td>
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<td>Start Date:</td>
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<td>End Date:</td>
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**Brief Description of Object:**

**Special Care Instructions from Conservator:** Describe environmental, cleaning, inspecting, moving, etc.

**Winding Instructions:** Describe how to stabilize the case, what to listen for, how high weights should go, which way to turn hands

<table>
<thead>
<tr>
<th>Winding Frequency:</th>
<th>Wind these Trains:</th>
<th>Key/Crank Location:</th>
<th>Silence These:</th>
</tr>
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<tbody>
<tr>
<td>None, Daily, Weekly, Monthly, Annually, Other</td>
<td>Time: Clkws, Counter CW</td>
<td>Case:</td>
<td>Strike, Chime, Alarm</td>
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<tr>
<td></td>
<td>Strike: Clkws, Counter CW</td>
<td>Winding:</td>
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<td></td>
<td>Chime: Clkws, Counter CW</td>
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Record of Monitoring and Plan of Care - Continued

Include picture/sketch below to clarify Care Instructions for winding, cleaning, inspecting, etc. Use letter codes as needed.

(C)ase (M)ovement (T)ime (ST)rike (STS)rike Silent (CH)ime (CHS)ime Silent (AL)arm (BR)oken (CO)rrosion (CR)acks/splits (D)amage (DL)icolored (FL)aking (LD)ight Damage (L)osses (M)old (W)east

<table>
<thead>
<tr>
<th>Dial</th>
<th>Case</th>
<th>Weights</th>
<th>Movement</th>
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**Winding Record:** Initial/date. Wind if necessary. Inspect. Notify conservator of new damage, unusual sounds, malfunction, etc.

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**Care Record:** Indicate (DU)sted, (WA)xed. Initial/date. Notify conservator of new damage, unusual sounds, malfunction, etc.

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**Notes:**

Photos Or Drawings
Museum Authored Care Guides

The Henry Ford Museum Care Guides
https://www.thehenryford.org/collections-and-research/digital-resources/caring-for-artifacts/
- Clocks
- Brass & Bronze
- Documents & Works of Art on Paper
- Furniture & Wooden Objects
- Glass & Ceramics
- Iron
- Silver

Winterthur Collection Care Tips

The National Trust Manual of Housekeeping, Chapter 29 - Clocks, Jonathan Betts, Pages 330 – 343
Caring for Clocks – Cleaning & Inspection

Cases

**Know** your materials and care for accordingly.

Ex: Wood cases: Dust and wax as necessary

**Avoid** cleaning with cloth – snags on veneer, and delicate and intricate pieces

**Avoid** sprays with alcohol, silicon

**Inspect** routinely for pest and other damage

The Henry Ford Museum Care Guides
Caring for Clocks – Cleaning & Inspection

Movements

Should be inspected, cleaned and oiled by a professional once every 5-10 years.

Inspections include looking for broken or worn parts, corrosion, accumulation of dirt or oil.

Note if clock runs irregularly or not for full duration. Call a clock professional.
Environmental – Stable Temperature and Relative Humidity

**Recommendations**

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<th></th>
<th>Winter</th>
<th>Summer</th>
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<tr>
<td><strong>Temp:</strong></td>
<td>70° F</td>
<td>70° - 75° F</td>
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<tr>
<td><strong>Rh:</strong></td>
<td>35% - 50%</td>
<td>40% - 60%</td>
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</table>

Wood cases and clocks constructed of various materials

Metals - 68° F and 30% Rh


National Parks Service: 60° - 75° F and less than 35% Rh for most metals

NPS, Appendix O, Curatorial Care of Metal Objects, [https://www.nps.gov/museum/publications/MHI/Appendix%20O.pdf](https://www.nps.gov/museum/publications/MHI/Appendix%20O.pdf)
Environment – Lighting

Limit Light

Levels (foot-candles or lux)
Types (visible or ultraviolet)
Length of exposure

To Minimize

Aging of finishes
Color changes of stains and paints of paper and textiles

Avoid heat generated from light sources. Finishes may become soft, sticky and easily damaged by dirt.

The Care and Preservation of Clocks, Mary M. Fahey, Chief Conservator The Henry Ford,
Pest Damage

**Carpet Beetles** – prefer adhesives generally found at joinery and inside clock cases. Look for tiny black beetles (2mm), small worms or furry carcasses.

**Powder Post Beetles** – bore small holes (2mm) in wood

**What to Do**

**Examine** items routinely for infestation

**Inspect** underside of legs and inside case. Insects hide in inconspicuous, dark places

**IF infestation is found**

**Isolate** object in plastic bag

**Call** a professional Conservator


Mold Damage

Wear Personal Protective Equipment
Identify and Assess
Develop a Plan
Isolate
Clean

Resources:

• Mold In Collections, National Heritage Responders, FAIC, https://www.culturalheritage.org/docs/default-source/resources/emergency-resources/tips-sheets/mold.pdf?sfvrsn=4

• Mold – YouTube Video – 8 minutes, 2006 Heritage Preservation, Inc https://www.youtube.com/watch?v=5nbAa0ekcXM
Safe Clock Handling

**Remove** objects that can scratch surfaces
- Belt buckles
- Jewelry – Rings, bracelet, watch, necklace
- Keys
- Chains

**Avoid** touching metal surfaces with bare hands
- Oils and salts from hands can lead to corrosion
- Wear vinyl gloves (no talc), especially when handling metal portions of the clock
Risks in Handling and Moving Clocks

Don’t lift a clock by its handle
   It may pull away from the case
Unsecured doors can open
Decorative elements can break
Unsecured pendulum and weight can damage the case
Pendulum bobs with mercury DO exist
   Use Extreme Caution!!!
Safe Handling - Considerations

**Size** and weight of Clock
- Number of people to safely move

**Condition** of Clock
- Fragile or compromised case, decorative elements, moving clock parts

**Materials** to safely move
- Dolly, blankets, padding, cart, etc.

**Route** Obstacles
- Thresholds, ceilings, stairs, floor coverings, other objects

**Final** Destination Preparation
Moving a Clock – Safe Handling DOs…

Remove case elements and move separately
  - Finials
  - Hood of Clock
  - Decorative Elements
Determine whether to unwind mechanism
Secure or remove the pendulum
Secure the escapement (spring driven)
Secure or remove weights
Secure or remove bells, rods, tubes and/or gong (if necessary)
Secure all doors
Moving a Clock – DO...

Know how heavy the clock is
Decide how many people are necessary to move the clock
Secure or Remove necessary clock case and movement parts
Decide where to hold the clock to lift and move
Create a clear movement route
Know where the obstacles are in the path, ex. door frame height, steps, protruding objects...
Ensure final destination prepared for clock
Institution Clock Moving Notes

ALL Clocks have metal components, so gloves should be worn with them at all times.

If the clock is to be moved to another room, it should be placed on a cart to move it.
- Clock is **very heavy**, requires at least 2 people to move.
- Check thoroughly for loose parts before moving it.
- Be very careful not to jerk or tilt.
- Front door opens, hinge is loose.
- Secure door.
- Clock has very small feet and is somewhat top heavy.
- Rear door latches well, turnkey clicks when engaging.
- Lift up carefully, watch foot placement when setting down.
Institution Clock Moving Notes

• 4 Person move - need 2 tall ladders and 2 people on the floor to receive parts.
• Bonnet (hood of clock) must be removed for any movement. Bonnet slides forward for removal.
• Weights have been removed.
• Don’t touch any painted areas or metal parts.
• Pendulum has NOT been removed from this clock, it is secured inside.
• Please contact conservation for any movement.

Biltmore
Moving Tall Case Clock – Video

Winterthur Museum
Care in Handling: Handling and Moving Tall Case Clocks, (2016)

https://www.youtube.com/watch?v=7_vl6mMAReg

21 min video
Displaying a Clock

**Shelf** – Level sturdy surface.

**Wall** – Often a single mounting bracket (verify solid)
   - Hang level on secure hardware
   - If possible second mounting point
   - Stabilize as necessary

**Tall Case** – Level, hard surface.
   - Stabilize & secure near top
Clock Museum Display Exhibits

Three-dimensional walk around showing variety of clock displays

National Watch and Clock Museum, Columbia, PA
Clock Museum Display Exhibits

Three minute video of the American Clock and Watch Museum

https://www.clockandwatchmuseum.org/
Should the Clock Run?

**YES**
- Dynamic object exhibit
- Watch it move
- Hear the beautiful sound
- Multi-sensory experience
- Knowledge and resources to care and maintain

**NO**
- Condition of clock is not functional
- Wear and tear on mechanical parts
- Clock Professional to service the movement
- Damage risk increases every time clock is handled during winding

Case-by-Case!

Who decides?
Winding the Clock

**Wind** clock at same time of week or day (30 hour clocks)

**Ensure** clear access to winding arbors (Hands not-in-the-way)

**Stabilize** clock with one hand

**Know** which way to turn key/crank
   Correct direction creates clicking sound

**Know** how high to wind weights

**Springs** wound until stops
Setting the Time

**Wear** gloves – most likely touching metal.

**Move** only the minute hand clockwise.

**Try** not to touch the dial when moving the hand.

**Careful** when minute hand is passing by the hour, second hand or other dial elements.

**Wait** for strike and chime to complete.

**If 24 hour** cycle know if AM or PM.

**Sometimes** easier to wait and restart clock.
Setting the Time with Strike or Chimes

Listen for the preparatory sound of the movement before it strikes/chimes.
Stop moving hand as clock strikes/chimes.
Move minute hand again after completion of strike/chime.
Repeat until correct time is set.
Do Not move the hands backwards
Sample Clock Winding Notes

English Bracket Clock

Wind the time arbor 7 revolutions each time it is wound.

The clock should be wound once a week.

If the calendar is off, wait until noon to change it because it changes naturally very late. Use a small pencil eraser to move the date wheel.
Sample Clock Notes

Library Clock

Wind each arbor 12 revolutions clockwise.

When moving the clock, you must remove the bell first, then the pendulum.
Sample - Clock Winding Notes

**Clock in Cabinet**

Only pull the rope down; don't lift the other up at the same time.

Wind the weight up only until it reaches the top of the open window.

To slow the clock down, turn the screw on the bottom of the pendulum to the left; one revolution equals about one minute in 24 hours.
Putting the Clock In-Beat

In-Beat - Even: Tick – Tock – Tick – Tock
Not in Beat - Uneven: Tick-Tock -----Tick-Tock
Level the clock
Adjust leveling to achieve even beat
Place shim under a side
Bend the crutch (Consult a clock professional)
Some clocks have beat adjusters
Putting the Clock In-Beat

NAWCC Video

Chapter 15 - Putting the Clock in Beat

2 min 27 sec video
Adjusting the Time – What to do

Running Slow

Want to **speed up** the pendulum by making it **shorter**.

**Turn** bottom nut to **raise** bob.

Running Fast

Want to **slow down** the pendulum by making it **longer**.

**Turn** bottom nut to **lower** bob.

Some Clocks have a **S – F** (Slow – Fast) adjustment on the dial.
Clock Care Dos and Don’ts

**DO**
- Create stable environment
- Wear gloves when handling
- Get to know the object
- Clean and inspect routinely
- Handle with care
- Make level and secure
- Pay attention to moving parts
- Pay attention to decorative and delicate elements

**DON’T**
- Oil the clock without proper tools and knowledge
- Wear jewelry or accessories that can damage a clock when handling
- Lift a clock by its handle
- Turn the minute hand backwards
- Synchronize chimes and strikes without proper training
- Move the clock without securing pendulum and weights
When to Call a Professional

To complete an assessment of the clock
To provide recommendations for a Record of Monitoring and Plan of Care
If the clock won’t run or runs erratically
   If uncertain about moving a clock
   For repairs to the case

When in doubt…Case or Movement
Call a clock professional
Where to find a Clock Professional

Clock repair professionals are not required to have a certification

The AWCI and the BHI offer clock certification

Personal referrals

Ask other museums who they use

Check with reputable antique clock dealers or auction houses

Contact a local NAWCC Chapter

NAWCC webpage Clock Business Search

   Agreed to NAWCC Code of Ethics

AIC Find a Conservator – Advanced search, select objects, click on search, then select subspecialty clocks/watches
Acknowledgments

Thank you to the following people for providing your time and expertise with this presentation.

Robin Bauer Kilgo, Connecting to Collections Care Coordinator, and the C2CC FAIC staff
Genevieve Bieniosek, Conservator, The Biltmore
Regis Cheval, Furniture Conservator and Clock Collector
Robert C. Cheney, Executive Director and Curator, Willard House and Clock Museum
Nancie Ravenel, Objects Conservator, Shelburne Museum
Howard Cohen, Board Member, American Watch and Clock Museum
Patti Philippon, Executive Director, American Clock and Watch Museum
Meghan Kennedy, Museum Registrar, National Watch and Clock Museum
Malcolm Archer, Clocks Programme Tutor, West Dean College of Arts and Conservation
Acknowledgments

Much appreciation to the experts at these institutions for posting on-line specific and thoughtful resources about caring for horological treasures.

- American Institute of Conservation (AIC)
- Foundation for the American Institute of Conservation (FAIC)
- Institute of Conservation (ICON)
- Canadian Conservation Institute (CCI)
- The Henry Ford
- The National Trust
- Winterthur
- National Parks Service (NPS)
- National Association of Watch and Clock Collectors (NAWCC)
- British Horological Institute (BHI)
- Antiquarian Horological Society (AHS)
- American Watchmakers - Clockmakers Institute (AWCI)
Questions

Willard House and Clock Museum