



MANUAL

FerryClock

Real-Time Ferry-Tracking Clock

'Kitty' MkII

D.I.Y. Assembly Instructions

AHOY!

Here be yer **FerryClock Kit** so ye might build yer own. Ain't it exactly a beginner's task, so best ye gots yer electro-techno sea-legs b'fore hoistin' sail. But ye needn't be frightened – we's done most of the hard work for ya. Trust yer-self. In the journey *and* the destination the adventure be!

(End Salty-Speak)

Your kit includes:

- All the laser-cut parts you'll need, sanded
- Servo-Motors, LED Lights, Wires, Misc Hardware
- Wi-Fi MicroController + USB Cable
- RF 'Atomic' Clock Movement + Hardware

TOOLS

You'll need these for assembly:

- Wood Glue
- Soldering Iron + Solder
- Wire Cutters + Strippers, Small Screwdrivers (+ -)
- Steady hands. Yes, it is a 'clock' after all, so a decent measure of delicacy and finesse is needed. Aim for millimeter precision when gluing the structure together. Soldering small parts is required. Be tactful.

SPACE

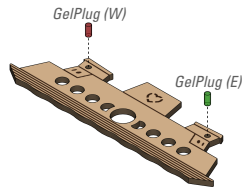
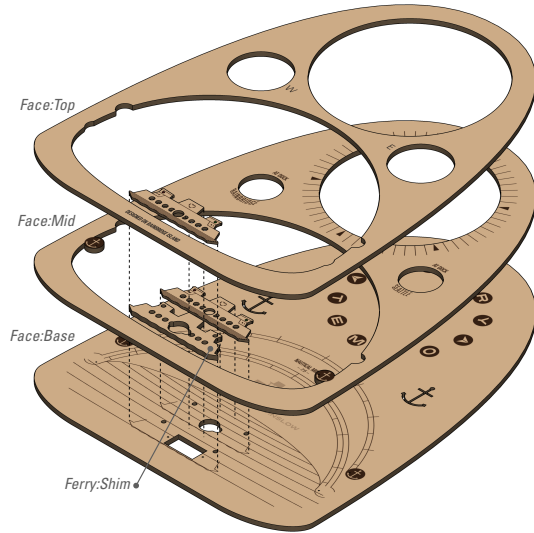
- An amply-sized flat + clean workspace is probably a good idea ;-)
- Use the box to store your work-in-progress.

Godspeed Sailor!

FERRY
TEMPO

DESIGNED ON BAINBRIDGE ISLAND

1



GLUE FACE ASSEMBLY

GLUING TIPS:

- Use your finger to spread a thin layer of glue evenly over entire part surface.
- Align like edges as best possible, sliding parts until precisely positioned.
- Be sure to give a good squeeze when fitting together, ensuring a tight bond.
- Clamping is advised if large parts are separating due to their tendency to bow.
- Give a few minutes between glue steps to allow setting, before stressing joint.
- Wipe overflow at edges with a damp cloth + cotton swab, as glue is water soluble.
- Overflow typically indicates that you are applying too much glue. Aim for none.

- LAY **Face:Base** upright on a flat surface.

- Apply **GLUE** to underside of **Face:Mid**.

TIP: It is not necessary to glue all the way to edges, as this is not a stressed joint.

- SET **Face:Mid** atop **Face:Base**, aligning carefully, and press down, moving pressure across surface.

TIP: Confirm positioning by 'eyeballing' various graphics, centering + aligning, adjusting until satisfied. The outermost edges are an ideal alignment means.

- Apply **GLUE** to underside of **Face:Top**.

- SET **Face:Top** atop **Face:Mid**, aligning carefully, and press down, moving pressure across entire surface.

TIP: Once the three panels are precisely aligned, gently place a heavy book or two atop the stack and wait at least 5 minutes to set. Beware shifting when placing book.

- Apply **GLUE** to underside of one **Ferry:Top**.

- SET in upper position atop **Face:Base**, aligning precisely via guide lines.

- Apply **GLUE** to underside of other **Ferry:Top**.

- SET **Ferry:Top** atop **Ferry:Shim** (opposite 'TOWARD FACE' indication), aligning carefully, and squeeze together.

TIP: Clean up excess glue at corners + portholes with a cotton swab.

- Apply **GLUE** to underside **Ferry:Shim**, the 'TOWARD FACE' side.

- SET in lower position atop **Face:Base**, aligning precisely via guide lines.

INSTALL COLOR FILTERS

FerryClock uses traditional red + green 'running light' colors to indicate vessel direction. We tint warm-white LEDs for an improved aesthetic over colored LEDs.

- INSTALL **red GelPlug** into west PilotHouse of each **Ferry**. (Fig. 1.1)

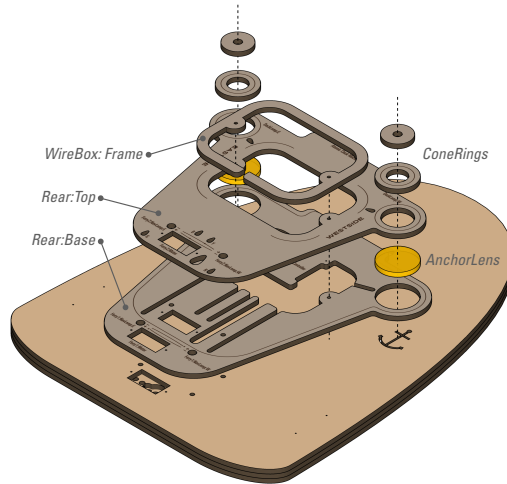
NOTE: The plugs are held in place through compression of the wood. They should be flush with the surface of the Ferry when properly installed.

TIPS: Obviously, this is a delicate step, working with such a tiny part. Use tweezers if helpful to get in position. A hard, flat object (e.g. a metal ruler) can help drive it flush. Also, the GelPlugs have a (very) subtle taper, which can facilitate installation.

- INSTALL **green GelPlug** into east PilotHouse of each **Ferry**.

After installation of all 4 plugs, hold your assembly up to a bright light source to verify translucency of plugs. Clean away any glue that may be interfering.

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GLUE REAR ASSEMBLY

GLUING TIPS:

- MDF is 'thirsty', so a bit more glue than expected may be necessary.
- Be mindful of larger pieces separating after gluing, and use book(s) while setting.

- FLIP entire assembly face-down.
- Apply GLUE to underside of **Rear:Base**.

NOTE: Do not apply glue to channels/fingers region above the two lower rectangles.

- SET atop underside of **Face:Base**, positioning carefully by centering anchors within circles, and aligning rectangular motor sockets.

NOTE: Precise alignment is critical. Be sure to complete this step carefully.

- INSTALL acrylic **AnchorLenses** into the holes above the anchor cutouts, with matte/frosted side down towards anchors/face.

- Apply GLUE to topside of **Rear:Base**, within marked perimeter outlining shape of **Rear:Top** to be set above.

NOTE: Again, do not apply glue to channels/fingers region.

- SET **Rear:Top** atop **Rear:Base**, aligning carefully, and press down, moving pressure across surface.

NOTE: These parts are prone to bowing once glued, and thus peeling up from the surface. Use heavy books to keep them flat while setting, at least 5 minutes. Check.

- Apply GLUE to underside of **WireBox:Frame**.
- SET atop **Rear:Top**, aligning carefully via outline, and press down.

- Apply GLUE delicately inside marked perimeter rings of **Rear:Top** surrounding the two **AnchorLenses**.
- SET larger **ConeRings** atop, aligning carefully via guide lines.
- Apply GLUE to inside marked perimeter of the larger **ConeRings**.
- SET smaller **ConeRings** atop larger, aligning carefully via guide lines.

Gluing is complete! Well done.

You can tidy up and stretch your sea-legs.

Next we embark on the electrical leg of our voyage.

3

Actual Size  Fig. 3.1

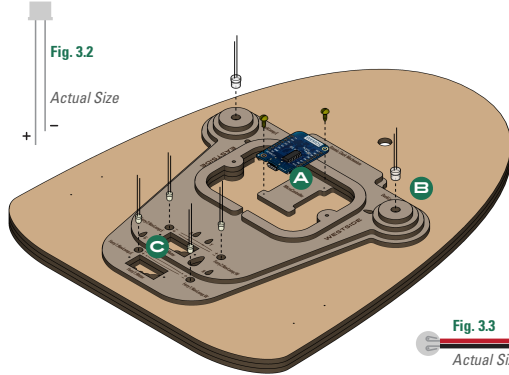


Fig. 3.3
Actual Size

Fig. 3.4
Actual Size

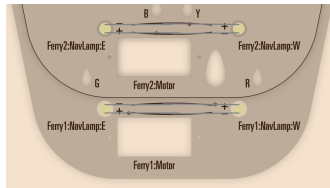


Fig. 3.5

INSTALL MICROCONTROLLER (A)

- Use (2) #2 x 1/4" Brass Screws (Fig. 3.1) to affix MicroController to mounting plank (snug will do), USB port pointing and facing down.

INSTALL + WIRE DOCK LAMPS (B)

LED NOTES:

- LEDs (Light-Emitting Diodes) are one-directional electronic components (unlike incandescent bulbs), meaning they will only work if wired correctly.
- The longer 'foot' is positive, the shorter is negative (or 'ground').
- INSERT both 5mm LEDs (Fig. 3.2) fully into holes at top of LampCones.
- TIP: If stubborn, gently apply pressure between feet with a flathead screwdriver.
- STRIP 1/4" from one end of both each of the 2-conductor wire (red/black) sections, separating them apart a bit as needed.
- TWIST and TIN the ends, helping to keep them tidy.

SOLDERING TIPS:

- Refer to the 'Soldering Is Easy' document for a useful overview of fundamentals and best techniques. Practicing a bit with some spare wire can be helpful.
- Avoid overheating any solder joint, as you risk damaging components (LEDs in particular are sensitive). Good electrical conductors = good thermal conductors.
- 'Tinning' means applying a light solder 'glaze' to exposed wire strands, fusing.
- Gently SPREAD the LED feet apart a bit, about 45°.
- CREASE tinned wire ends around each foot, red to positive, black to negative. Slide the 'hooks' down so they sit just above the LED. (Fig. 3.3)
- SOLDER the connections, quickly and cleanly. Gently tug to verify joint.
- CUT the feet to trim excess length, leaving about 1/4". Bend gently away from each other, minimizing the pokey hazard of the sharp cut ends.
- THREAD wires into eyelets beside LampCones, through channel, and into WireBox about a 1/2". The slack will be taken up later.

NOTE: Inspect the junction and ensure the soldered connections are independent.

INSTALL NAVIGATION LAMPS (C)

- INSERT the (4) 3mm LEDs (Fig. 3.4) into the (4) holes marked with 'NavLamp', respecting their positive/negative 'foot' orientations via the marked '+/-' symbols.

NOTE: Proper orientation of the LED feet is critical. Complete this step carefully.

TIP: The LED should fit snugly. Confirm it is fully seated by gently applying pressure between feet with a flathead screwdriver.

- For each horizontal pair (one for each boat), BEND 3mmLED feet inwards towards one another (Fig. 3.5), striving to lay them flat + parallel, with both upper feet touching/overlapping, and both lower feet touching/overlapping ('holding hands').

NOTE: The upper foot connection 'span' and lower span must not touch one another, as a short circuit will occur.

- SOLDER all (4) intersections of 3mmLED feet, lightly just to 'tack'.

TIP: Solder quickly, as to avoid overheating LED, which may result in burnout.

4

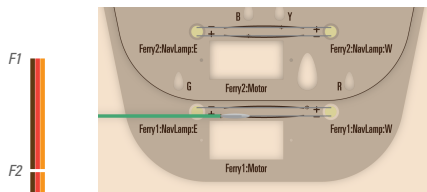


Fig. 4.1

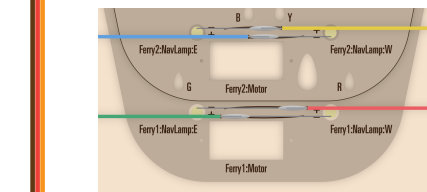
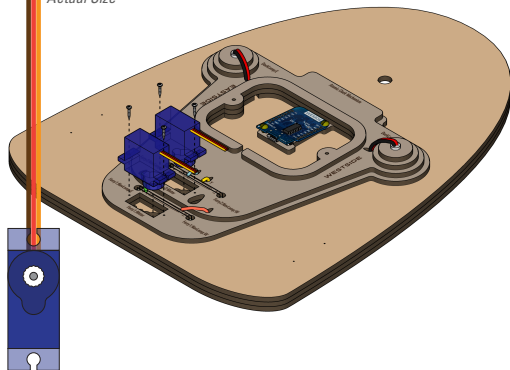


Fig. 4.2

Fig. 4.3

Actual Size



WIRE NAVIGATION LAMPS

- STRIP 1/2" from one end of each of the (4) loose colored wires (Red, Green, Yellow, Blue).
- TWIST and TIN the ends.

- LAY exposed green wire parallel with lower 3mmLED foot 'span' (Fig. 4.1), placing so that insulation begins with marked asterisk (*).
- SOLDER wire to lower 3mmLED span.

TIP: Tucking wire under span, even winding once, can help secure it for soldering.

- REPEAT for (3) remaining wires at 3mmLED spans. (Fig. 4.2)
- THREAD the (4) wires into eyelets marked for their respective colors (G,R,B,Y), through channel, and into WireBox about 1/2".

NOTE: Be sure that the wire from the lower span (per each boat) does not drape across the upper span after being pulled (thus more vertical), causing a short.

INSTALL + WIRE MOTORS

- CUT the 3-wire bundle from each ServoMotor to length as a whole (Fig. 4.3), removing + discarding plastic connector.

NOTE: Cut Ferry2:Motor wires 1" shorter, as they have lesser distance to travel.

- INSERT the two ServoMotors into their sockets in the rear panel assembly, wiggling/jiggling as required to seat them fully.

NOTE: This can be tricky, as the tolerances are tight. The motors flanges (containing screw holes) should be as far down as they can be, butting up to the panels. Also, the motors should be perpendicular to the face, not skewed at an angle.

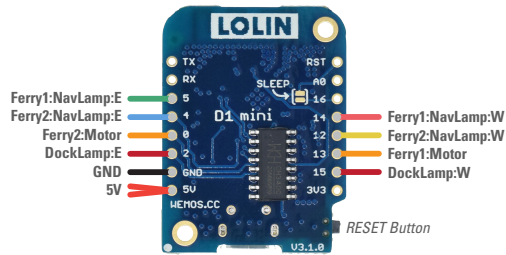
- SECURE in place with (4) Silver Piercing Screws, through small holes in ServoMotors into MDF, tightening until snug (avoid stripping).

NOTE: Ensure screws are fully driven, with heads seated against motor flanges.

- MARK a bit of the cut end of the orange ('signal') wire from Ferry1:Motor with a black marker to help identification later.
- THREAD Ferry1:Motor wires into large eyelet, through channel, and into WireBox about 1/2".
- THREAD Ferry2:Motor wires into same eyelet atop the other wire bundle, through channel, and into WireBox about 1/2".

TIP: Remove twists from wire bundles before threading into eyelets.

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WIRE NAVLAMPS → MICROCONTROLLER

- Gently PULL the (4) colored **NavLamp** wires taut, taking up slack.
- STRIP 1/8" from the end of each of the wires. Tightly twist the exposed strands of each to tidy.
- INSERT **green** wire into pin (hole) 5 on **MicroController**. Bend outward (fold-over 90°) gently to expose a smidge of wire (enabling soldering).
TIP: If difficulty is had inserting wire ends into microcontroller holes, tightly twist wire ends and 'tin' with a touch of solder (just enough to fuse strands).
NOTE: It is important to make sure no stray wire strands 'creep' out towards other pins, as they can cause shorts (as should be obvious). Also, if the lengths of exposed wire are too long, they may make contact beneath with those of their neighbor.
- SOLDER joint, aiming for a tidy little volcano/chocolate chip shape.
TIP: Use your iron tip to heat both pin and wire immediately before applying solder.
- REPEAT for (3) remaining wires, SOLDERING each to their proper 'NavLamp' pin via **MicroController** wiring diagram.

WIRE DOCKLAMPS → MICROCONTROLLER

- Gently PULL both 2-conductor **DockLamp** wires taut, taking up slack.
- SPLIT the wires apart into two separate strands.
- STRIP 1/8" from the end of both **red** (positive) **DockLamp** wires. Tightly twist the exposed strands of each to tidy.
- SOLDER each to their proper 'DockLamp' pin via diagram.

WIRE MOTORS → MICROCONTROLLER

- Gently PULL both 3-conductor **ServoMotor** wires taut, taking up slack.
- SPLIT both 3-conductor bundles from **ServoMotors** into separate 2" strands by peeling apart. (Fig. 5.1)

-
- STRIP 1/8" from the end of the both **orange** (signal) wires. Tightly twist the exposed strands.
 - SOLDER each to their proper 'Ferry.:Motor' pin via diagram.
NOTE: Remember your marked wire – proper motor assignment is imperative!

-
- STRIP 1/4" from the end of both **red** (positive) wires. Tightly twist **both** together into a single tight, uniform strand.
 - SOLDER twisted union to **5V** pin on **MicroController**.

-
- STRIP 3/8" from the end of both **brown** (negative) wires.
 - STRIP 3/8" from the end of (1) **black** (negative) **DockLamp** wire.
 - STRIP 5/8" from the end of the other **black** **DockLamp** wire.
 - TWIST all 4 wires together into a bundle, intentionally leaving the longer wire protruding as a 'tail', and SOLDER together to unify. (Fig. 5.2)
 - SLIDE **ShrinkTube** over bundle, covering bulk of wires, but leaving about 1/4" of 'tail'. SHRINK by rubbing with soldering iron shaft, all around.
 - SOLDER 'tail' to **GND** pin on **MicroController**. Bend at 90° to lay flat.

Check your work, making sure all pins are independent.

6

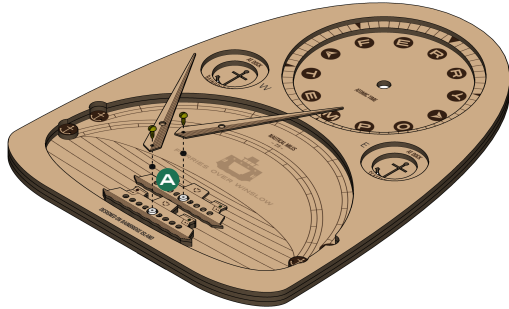
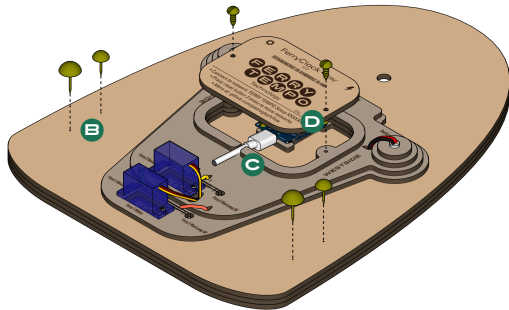


Fig. 6.1
Actual Size

Fig. 6.2



INSTALL FERRYHANDS (A)

- PLACE clock face-up.
- INSTALL each **FerryHand** (indicator) using a **#2 x 1/4" Brass Screw** (Fig. 6.1) + nylon washer beneath hand. Position pointing at 'noon' (for now).
TIP: Tighten screw until hand rotates with a bit of resistance. It must 'grip' the top of the shaft of the ServoMotor, and therefore should not be 'floppy'. We will be more precisely positioning the FerryHands soon.

INSTALL STOPS (B)

- PLACE clock face-down.
- INSERT (2) **larger Brass Tacks** into **lower** holes until fully seated.
TIP: You will need to lift the face off of your workspace and hold it to fully complete the tack installation. If stubborn, gently hammer tacks to start.
- INSERT (2) **smaller Brass Tacks** into **upper** holes until fully seated.

INSTALL USB CABLE + POWER ON (C)

- TIDY all small wires in the **WireBox**, gently packing down and around.
- INSERT **MicroUSB Cable** into **MicroController**, atop cables and pass cord through channel in **WireBox:Frame**.
NOTE: Loosening the brass screws a bit is helpful to angle the MicroController to better receive micro-USB connector. Snug them up after installation of cable.
- CONNECT **Cable** to a **USB power source** (computer/wall adapter).
TIP: That old phone/tablet/e-reader charger 'block' you have lying around makes an ideal dedicated power supply for your Ferryclock. Ideally, it should provide 1A (1000mA) or more, indicated somewhere on the block in (usually) tiny print.
- VERIFY operation of both motors and all lights during startup sequence.
NOTE: A 'factory' state Ferryclock (with no saved credentials) will run a brief test sequence immediately following connection to power. Use this test to verify successful wiring and Ferryclock installation. If Ferryclocks do not move, you may need to tighten their screws a bit (snug – avoid over-tightening). If motors still do not move and/or dock/nav lamps are not lighting, carefully check all of your wiring/ soldering for loose connections and short circuits, especially at the MicroController.

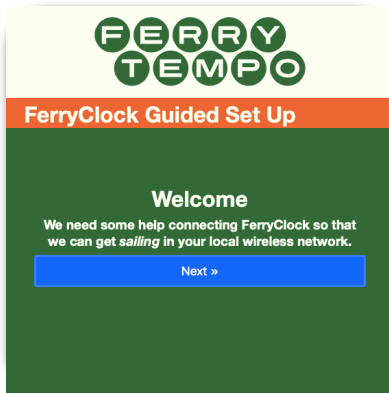
- POSITION **FerryHands** at '12 o'clock' to set their proper positions.

NOTE: Following the startup test sequence, both motors 'anchor' themselves at their motion midpoints, allowing calibrated positioning. Manually move both FerryHands at this time so they are pointing vertically (noon). Further calibration of the Ferryclock is outlined in the following section.

INSTALL WIREBOX COVER (D)

- Use (2) **#4 x 3/8" Brass Screws** (Fig. 6.2) to affix **WireBox:Cover**.
NOTE: Cover removal should only be necessary to access the physical 'RESET' button on the MicroController, triple-pressing to erase its stored credentials, allowing Ferryclock to be reconfigured within a new wireless network.

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CONFIGURE + CONNECT

- JOIN the wireless network named 'FERRYTEMPO' using a Wi-Fi enabled device (computer, phone, tablet).
- After connection, the configuration page should automatically open.
- If page does not open after 10-15s, ENTER setup.ferrytempo.com into your web browser. (If that doesn't work, try entering 192.168.4.1)
- Follow the onscreen dialogue to set up your FerryClock.

The status box will show your connection status.

- WAIT up to 30 seconds for your FerryClock to connect to the FERRY TEMPO server (read more about it in the next section).
- CONFIRM relative vessel positions via comparison with <http://www.wsdot.com/Ferries/VesselWatch/>.

Assuming it is working... Congratulations!

- PAT self on back. ENJOY the magic. (at least for a moment... we still have the clock mechanism to install ;-)

Once configured, FerryClock will retain your local wireless network login credentials in its flash memory. To reconfigure for a new wireless network, 'Deep-Reset' the microcontroller by pressing the 'RESET' button 3 times in even succession, spaced to a count of 'Wenatchee'. If reset was successful, it will run the 'test sequence'.

TROUBLESHOOT

- If you can't connect, check the network name and password, and try positioning your FerryClock closer to your wireless router.
- Read the more thorough guide online at: <https://github.com/pietroglyph/fow/tree/master/ferry-tempo>
- If you're still unable to connect, feel free to contact us at: info@ferrytempo.com

CALIBRATE FERRYHANDS

Ideally, positioning FerryHands at 'noon' in the previous step should mean they are perfectly calibrated. However, 'hobby' servo-motors are not perfectly precise. Calibrating them may take a tiny bit of observation over time.

You may notice that a motor 'buzzes' when it encounters resistance, likely when a FerryHand has reached a physical stop on the face, but is still motoring (NavLamp is on), having yet to dock. If this is the case, simply 'nudge' your indicator (it should slip a bit, assuming the screw is not too tight) away from the port by a few degrees. If you go too far here, then you'll need to do the same to the opposite side.

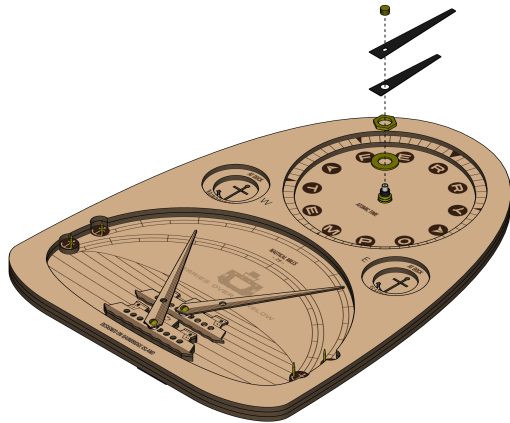
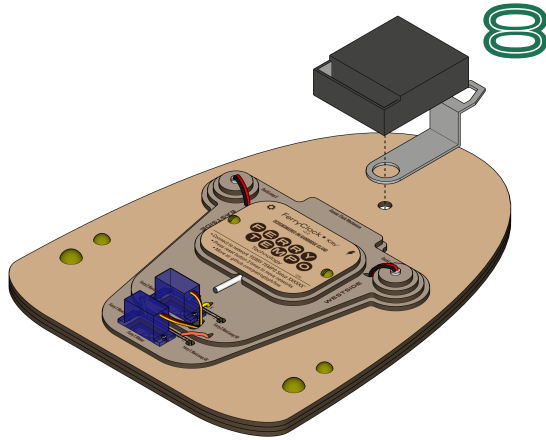
NOTE: *Repositioning a FerryHand when its boat is in port is not effective, as the servos power off when at dock, and thus you'll spin the shaft, not adjust the hand.*

If you have lost reference for calibrating your hands:

- Attempt to properly position by being attuned to the crossing progress, using NavLamps + DockLamps as guides, and perhaps VesselWatch webpage.

-or-

- 'Deep Reset' (see above) to initialize motors (reconfiguration required).



INSTALL CLOCK MOVEMENT + HANDS

The self-setting radio-controlled 'atomic' clock mechanism is a bit different than your standard clock movement, so be sure to follow the instructions carefully.

- **DO NOT** install battery immediately!
- **FOLLOW** the steps outlined in the separate manufacturer's **Manual**.
NOTE: If your intention is to hang FerryClock on a vertical surface (wall, bulkhead), be sure to substitute the included metal hanger for the rubber gasket in the separate manual's exploded diagram (as depicted in the diagram here).
- **READ** the 'RC Quartz Movement' manual in its entirety to familiarize yourself with this awesome little timekeeping device.

LAUNCH YOUR FERRYCLOCK

- **HANG** on a wall via an appropriate means (nail, screw, hook).
-or-
- **PLACE** FerryClock in a stand or plate-holder for display on a surface.

Cheers Mate!



Bon Voyage!

PERSONALIZE + POLISH

BONUS

ARTIFY AND/OR SEAL

Sketch a Salish scene, create a collage, add some color, etc... Be propelled by your passion for the pacifying waters of the Puget.

- PAINT and/or FINISH (recommended at minimum to seal) your FerryClock face, boats, and case cover.

TIP: A simple oil finish brings the grain to life and helps your FerryClock look shipshape. Hemp, Tung, Linseed or Danish oil are easy + attractive finishes. Removal of all hands prior to application facilitates the process.

NAME YOUR BOATS

Every trusty ship deserves a name. Do the right thing.

- NAME your boats using a pen, marker, brush etc. along the space following 'M/V' (Motor Vessel).
- HOLD a little ceremony, maybe a toast.

NAMING TIPS/SUGGESTIONS:

- Mottos
- Lost loved ones (people + pets)
- Favorite ports of call/travel destinations
- Beloved historical figures (explorers, activists, athletes, prophets, etc.)
- Famous power couples (e.g., Lucy & Ricky, Bonnie & Clyde, Siegfried & Roy, Moose & Squirrel...)

HOW IT WORKS

A proprietary algorithm (created by the programming Captain of the BHS robotics team; 'Spartronics') running in the 'cloud' (on our server) continually compares the up-to-the-minute (every 5s) latitude/longitude (GPS) location of a real ferryboat (via the WSF 'VesselWatch' API) against a reference path to generate a precise sailing progress value. A small, Arduino-compatible microcontroller (WeMos D1 Mini ESP8266) within FerryClock connects to the FERRYTEMPO server over Wi-Fi to receive fresh data, controlling the lights and motors accordingly.

Test the functionality yourself here:

<http://bridge.ferries-over-winslow.org/debug>

CONTRIBUTE TO THE CODE

Our code is open-source, available free for anyone to use, reference, and expand upon. Actually, it is our hope that others will find it useful as a building block for their own public transit visualization concepts.

If you are of a programming mentality + ability, and would like to facilitate the evolution of our technology, please kindly consider contributing via our Git here: <https://github.com/pietroglyph/fow>

FERRIES OVER WINSLOW

FERRYTEMPO is the 'tugboat' – serving to develop/market/fundraise – for **Ferries Over Winslow**, a proposed public service/kinetic functional-art installation for downtown Bainbridge Island, Washington. It will fill a yet-realized role as an at-a-glance ferry crossing reference, tracking progress of the actual boats in real-time, outdoors in all-weather. The project will prove informative + fun for locals and visitors alike.

In brief, electromechanical 'FerryBots' voyage between two masts capped with iconic figureheads representative of each port; a whimsical yet practical way to display the tireless boats relied upon in our day-to-day.

The installation aims to be clock-like + precise, and will utilize bespoke hardware solutions paired with FERRY TEMPO software technology.

So much is digital and screen-based; Here we might revive some awesome, animated analog!

And so much is heavy in the world, sad and serious; Here we might offer up a bit of levity.

Learn more at: www.ferries-over-winslow.org



CONTRIBUTE TO THE CAUSE

Our dream is a big one: essentially an outdoor, jumbo-scale, real-time ferry-tracking installation. Design + engineering is underway via the help of a small, salty crew of volunteers. Fundraising is our next phase.

We are a non-profit corporation in Washington State. All profit from sale of this kit directly supports the endeavor. We are hoping to raise \$47K. If you'd care to make a tax-deductible donation to support the project, please email: info@ferries-over-winslow.org

FREQUENTLY ASKED QUERIES

F.A.Q.

WHY ARE THE NAVIGATION LIGHTS GREEN AND RED?

Boats (and airplanes, too) use these colors to help others identify their sides (and thus heading) from a distance. For example, if a green light is visible, you are seeing the vessel's starboard side, and it therefore is moving to the right. A good rule of thumb to remember: Think Shorter/Longer Words. So:

Red | Left | Port *versus* **Green | Right | Starboard**

WHY IS MY FERRYHAND NOT ACCURATE?

It is possible your hand is a bit too loose and 'floppy'. It must 'grip' the seat of the shaft of the motor beneath. Refer to section 'Calibrate FerryHands' to resolve.

MY FERRYHANDS ARE COLLIDING DURING CROSSINGS; HOW DO I RESOLVE?

The two FerryHands cross closely, and if they do not stay within the plane that is their 'lane' they may make contact, inhibiting motion. You may 'tune' the hands in three ways: Firstly, if bowed (they are made of very thin wood), flex it gently opposite the curve, ideally stretching the tight grain responsible for the bow, so it relaxes into straightness. If straight, gently adjust the hand/motor-shaft interface, almost 'massaging' it to subtly reset it (loosen then tighten the screw if needed). Finally, squeezing the two motors together (from the rear) will cause the hands on the face to splay apart. They want to spring back after you release tension, but by giving them a good hard squeeze, you can effectively reset them a smidge.

WHY DOES MY FERRYCLOCK MAKE SOUNDS?

FerryClock uses economical 'hobby' servo-motors to mechanically indicate ferry crossing progress. They are remarkable little electronic components, having integrated within a tiny motor, gearbox, position sensor (potentiometer), and controller chip. High-precision units are spendy, thus we use economical versions, as they are 'good enough' for the demands of FerryClock. A drawback is that they can occasionally buzz when striving to be in position.

Buzzing may occur if a hand is not calibrated properly, so that it prematurely runs into a stop at either end of its range, thus 'groaning' about wanting to go further. An easy way to confirm this is to see if it has hit a stop whilst its corresponding NavLamp is still lit. See 'Calibrate FerryHands' section to correct. Also, it is possible the USB power supply you've chosen does not supply adequate amperage. 1A (1000mA) or greater is recommended.

WHY ARE A USB POWER SUPPLY AND BATTERY NOT INCLUDED?

In short, because there are enough in the world already. We believe the chances are very high that you have an old USB power supply laying around from a defunct electronics device. Reuse it. Similarly, you probably have a drawer full of batteries that want to be used.

MY USB CABLE IS TOO SHORT/LONG; CAN I SWAP IT OUT FOR ANOTHER?

Surely. Nearly any 'Micro-USB' cable should work.

HOW DO I KEEP MY FERRYCLOCK UP-TO-DATE WITH THE LATEST FEATURES?

FerryClock routinely looks for available software updates from our server, and will automatically download and install them. We will email you with feature additions.

BY WHICH METHOD DO THE HANDS MOVE?

OK, this is not a frequently asked question, but it is included here for explanation and those curious. A FerryHand moves in direct correlation with the velocity of the actual Ferry, accelerating + decelerating. Hence, FERRY TEMPO is functionally a dynamic vessel 'progress-tracker' rather than linear ETA 'timer hourglass'.

I HAVE SOME IDEAS/QUESTIONS; HOW DO I CONTACT YOU?

Email us at info@ferrytempo.com.

