

Week 5 AI Documentation

MAS.863 How To Make (Almost) Anything, Martín Chujfi. Conversation with Claude (Anthropic), October 19–21, 2026.

This is a condensed log of the conversation I had with Claude while finishing, milling, soldering and testing my Week 4 board and building this page. Each row pairs what I asked (paraphrased) with a summary of how Claude responded. The log was written by Claude from the conversation; it is a summary, not a word-for-word transcript.

How I used AI this week: troubleshooting KiCad and mods, interpreting DRC errors, choosing parts, debugging shorts and bad joints, writing the Arduino test sketch, explaining circuit concepts, and editing the website and compressing media. All milling, soldering, measuring and repairs on the board were done by me (with help from TAs and classmates).

1. KiCad: board outline and Gerber export

What I asked	Claude's response
How do I modify my Edge.Cuts outline?	Explained selecting the Edge.Cuts shape (making the layer active or filtering selection to Graphics), dragging handles or typing coordinates, unlocking locked items, and refilling the copper zone afterwards.
What am I doing in the Plot / Generate Drill Files dialogs to save the Gerbers?	Explained that Plot writes the Gerbers and Generate Drill Files writes the .drl files, which layers to include, and pointed out that the Plot output directory was empty so the Gerbers and drill files were going to different folders.

2. Toolpaths in mods not closing around the Xiao pads

What I asked	Claude's response
Mods toolpaths don't match my PNG; the Xiao pads don't close at the top (Slack thread with a TA suggesting a larger ground-plane clearance).	Explained that mods skips any gap narrower than the bit ($1/64" = 0.4 \text{ mm}$), so 16 mil gaps fail inconsistently after rasterization. Recommended 0.5 mm zone clearance and net-class clearance, a higher export DPI, and checking the mods preview; warned against entering a smaller bit diameter.
Set both net classes to 0.5 mm clearance.	Confirmed, then explained the next steps: refill zones, run DRC, re-export.
DRC: three clearance violations to no-net circles on J1/J2, plus an unconnected item.	Explained the violations were harmless mechanical circles (nudge or exclude) and that the unconnected item mattered more.
Unconnected item is Xiao pad 15 (GND underneath); how do I fix it properly instead of excluding it?	Suggested placing a No Connect flag on the pin in the schematic (or a footprint without the underside pads), explained how to place the flag, then the same for pad 19.

What I asked	Claude's response
Last error: Zone [GND] to Zone [GND].	Identified that the larger clearance had split the ground pour into two islands. After a few rounds (and correcting a suggestion of mine that didn't help), the fix was lowering the zone's minimum width from 0.4 mm to 0.2 mm.
Drill files updated but the Gerbers didn't.	Explained that only Plot regenerates Gerbers and that the Gerbers were going to a different folder than the drill files.
Does the new mods preview look good to mill?	Confirmed all pads and traces were closed and listed pre-milling checks (tool diameter, cut order, origin).

3. Milling, parts and soldering

What I asked	Claude's response
Some traces don't look clean inside the grooves (photos). Is this a concern?	Explained the rough texture is substrate at the bottom of the cut, pointed out one copper burr, and recommended deburring, cleaning and a continuity check.
How do I do the continuity pre-check with this Fluke 107?	Explained continuity mode on the meter and which pairs should and should not beep.
What should I solder after the Xiao? (schematic)	Gave a soldering order (resistors, LED, diodes, MOSFETs, switch, headers), polarity rules for D1-D3, and pre-power checks.
LED D3 polarity: are the green marks the cathode?	Said the green corner marking is commonly the cathode but recommended confirming with the meter's diode test.
Diodes are CDBM1100-G; MOSFET listings show 5.2 A and ~90 A options; which switch (PTS636 1x2 or 2x2)?	Confirmed -G is the lead-free version of the same diode, the 5.2 A SOT-23 SI2336DS is the right MOSFET, and the 2-terminal PTS636 (no polarity) matches the footprint. Used web search for the part specs.
Switch: both ends beep to ground; then a pad peeled off while fixing the short.	Walked through isolating the short, repairing a lifted pad with a jumper wire, and cutting the old shorted trace so the new wire isn't grounded.

4. Testing the board

What I asked	Claude's response
How can I test the board beyond continuity, without 12 V or a coil?	Wrote board_test.ino (button, LED, both MOSFET gates, TRIG, serial output) and a test plan: gate voltages, drain-to-ground resistance for switching, and an optional 12 V test with an LED stand-in.
Compile error: PIN_LED already defined.	Renamed the constants to avoid the XIAO RP2040's built-in macro names.
Gate side of R1 reads 0 V.	Gave a step-by-step isolation procedure. Martin found and fixed a bad solder joint on the Xiao D0 pin; the gate then read 3.3 V.

What I asked	Claude's response
Can I do all the tests with board_test.ino? Is it fine without a power source or coil?	Mapped every test to board_test.ino and suggested how to document what was and wasn't tested.
Why are there two resistors before Q1? Does OL mean zero?	Explained the 100 ohm series gate resistor and the 100 k pull-down, and that OL means open circuit.

5. Website

What I asked	Claude's response
Make the committed week 5 page match the other weekly pages.	Through the linked computer, edited week5.html (title, navigation, layout wrapper, pager, test-code section), added Week 5 to the home and weekly lists, linked Week 4 to Week 5, fixed figure markup on Week 4, and committed.
Compress and add the photos and videos in W5_RAW.	Converted 17 HEIC photos to JPEG (max 1600 px) and 5 MOV videos to 720p H.264 MP4 (about 450 MB down to 29 MB), added them to week5.html in a block for Martin to place, and added a .gitignore for the originals.
Link this chat as AI documentation and use a new photo as the thumbnail.	Generated this PDF, linked it from week5.html, set the new thumbnail, and committed.