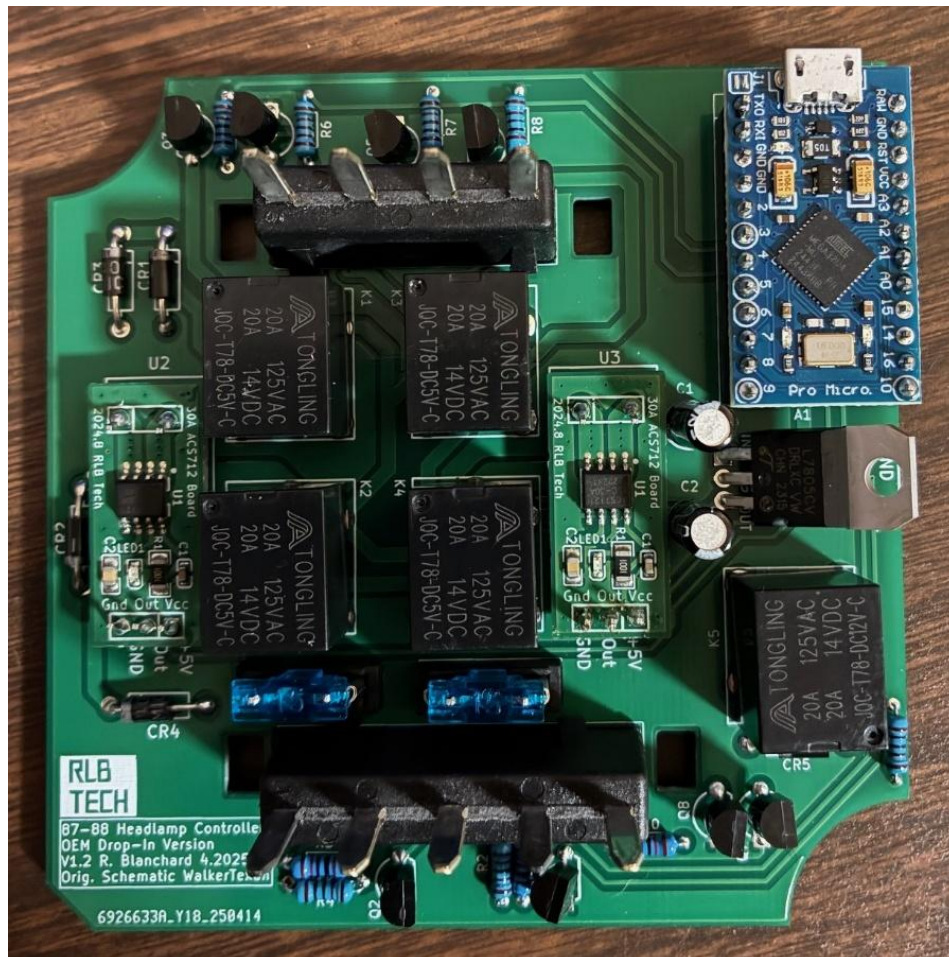# 87-88 Fiero Headlight Module

V1.2 by Ryan Blanchard

Based on an original schematic and code by WalkerTexan

# Basic Assembly Guide

# DISCLAIMER

**Before proceeding, please read and understand the following:**

1. This is a DIY project designed by hobbyists.
2. The kit is provided with no warranty expressed or implied.
3. Although I have operated this module in my own car for one year with no problems, I am still only one man with one car.
4. You are installing this headlight motor control module into your car at your own risk. As with all electronic devices, improper assembly or handling can risk electrical shock or fire.
5. By assembling and using this DIY kit, you agree to hold harmless Ryan Blanchard and WalkerTexan in the event of any and all malfunction or damages caused by its use.

# Kit Contents

Each kit contains:

| | |
|---|---|
| 1x Printed Circuit Board | 7x 1K ohm 0.25 watt resistors |
| 1x Pro Micro microcontroller board | 3x 10K ohm 0.25 watt resistors |
| 4x JQC-T78-DC05V-C 5 volt relays | 2x 10 uF 25V Capacitors |
| 1x JQC-T78-DC12V-C 12 volt relays | 1x L7805CV voltage regulator |
| 5x 1N4001 rectifier diodes | 1x 24-pin DIP socket |
| 8x 2N2222A transistors | 2x low-profile fuse holders |
| 2x 30A current sensor modules | 2x low-profile 15A fuses |
| 2x 2-pin headers for current sensor | 2x plastic spacers for vehicle harness pins |
| 2x 3-pin headers for current sensor | |

You will need to provide:

- Soldering/desoldering supplies
- 4-pin and 5-pin headers from an original Fiero/Firebird/Corvette headlight module
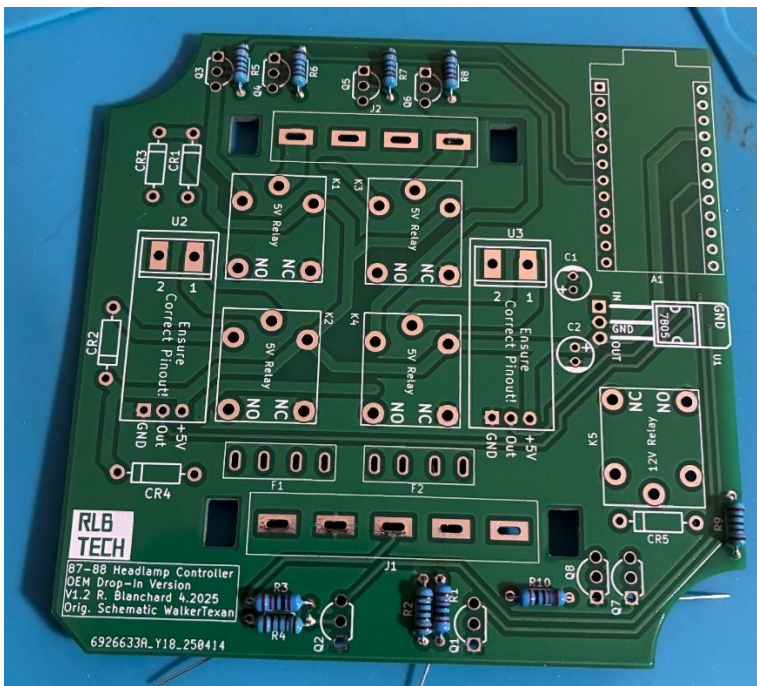- Original casing from an original Fiero/Firebird/Corvette headlight module

# Assembly

There is no specific order in which the parts must be assembled, but this is the order I have found to be easiest.
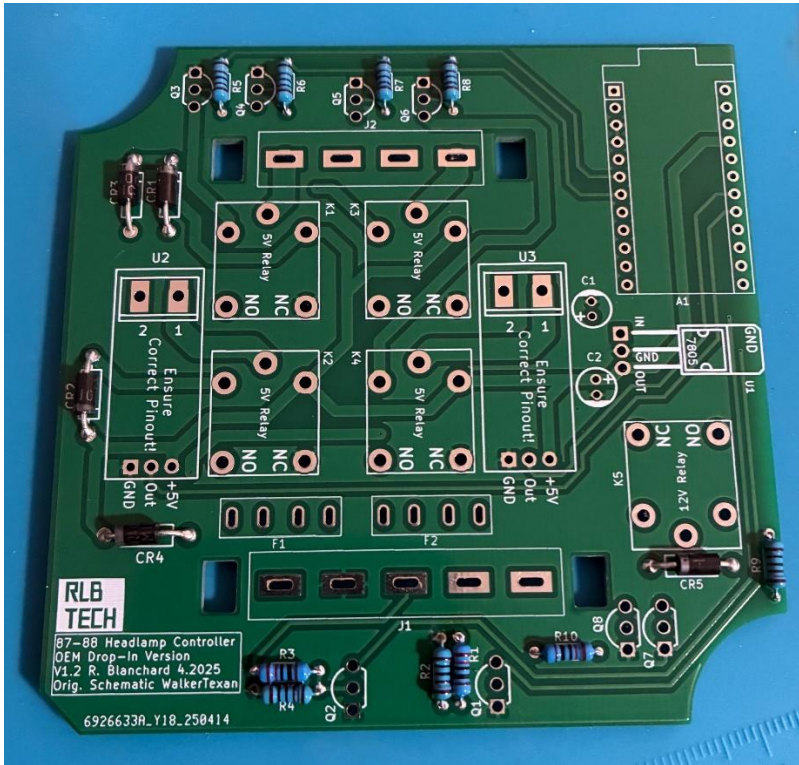
1. Install and solder the 1K ohm resistors in locations R2, R4, R5, R6, R7, R8, R9
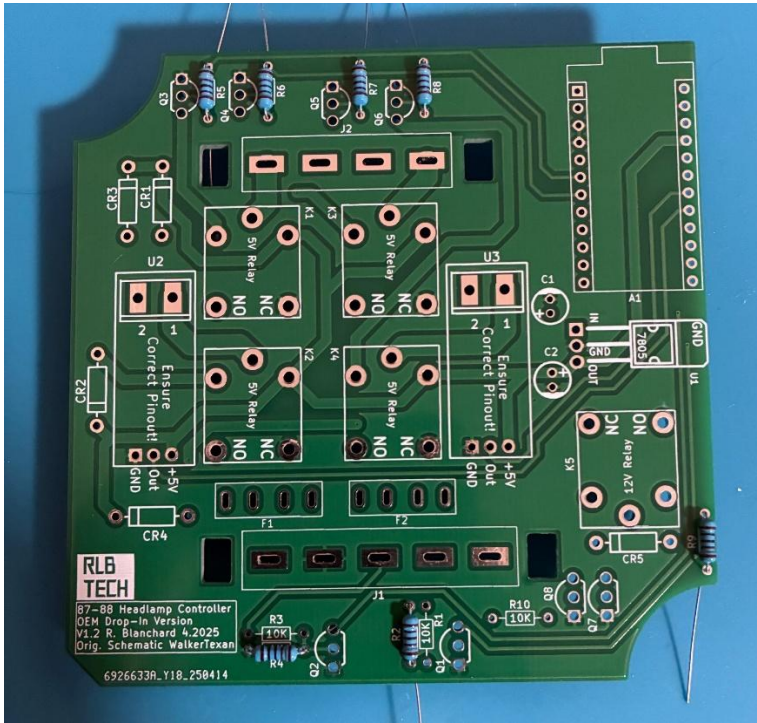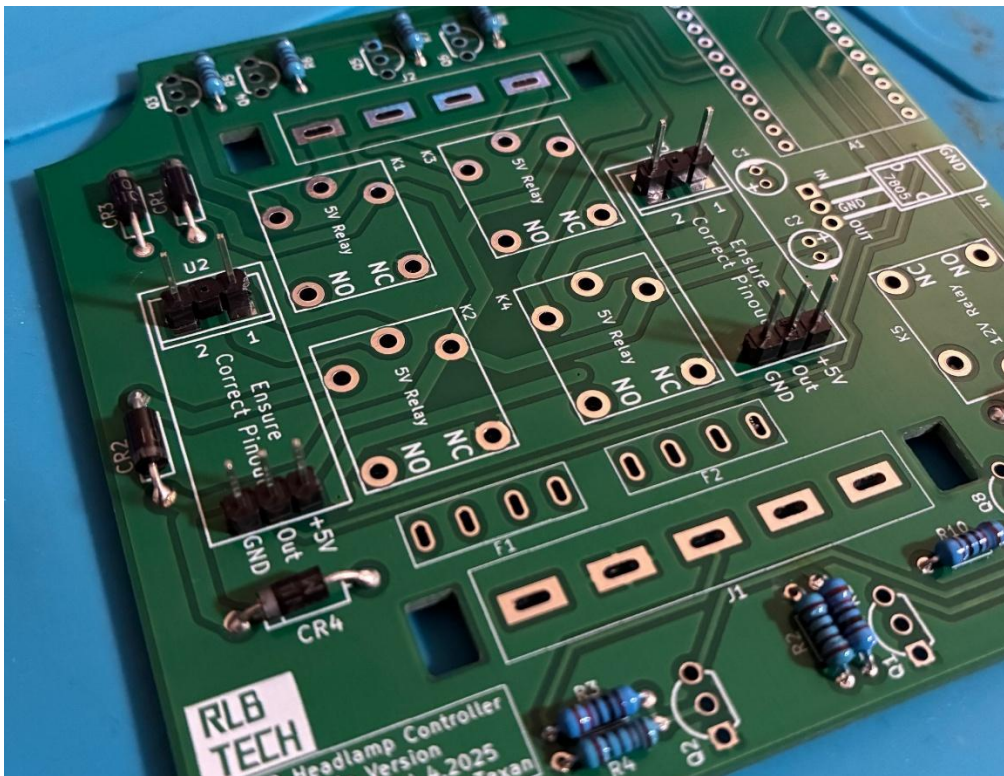


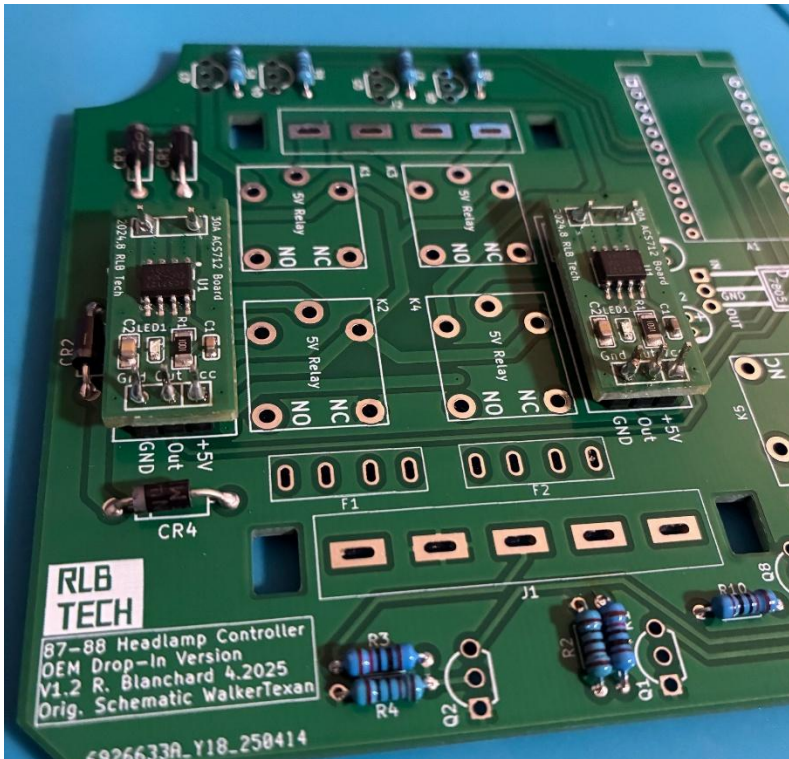2. Install and solder the 10K ohm resistors in locations R1, R3, R10

3. Install and solder the 1N4001 rectifier diodes in locations CR1, CR2, CR3, CR4, CR5



4. Install and solder the 2 and 3 pin headers at locations U2 and U3. Try to keep them as upright as possible. These will be used to current sensor sub-modules.

5. Desolder the pre-existing pins and wire terminal from the current sensor sub-modules. If you encounter difficulty removing these parts, a chip removal alloy such as Chip Quik can make it much easier. Be sure to clean up the soldering pads on the module using desoldering braid or your desoldering tool of choice.

6. Install the current sensor modules onto the pins you soldered in step 4. Solder in place.



7. Install and solder four 5 volt relays in locations K1, K2, K3, K4
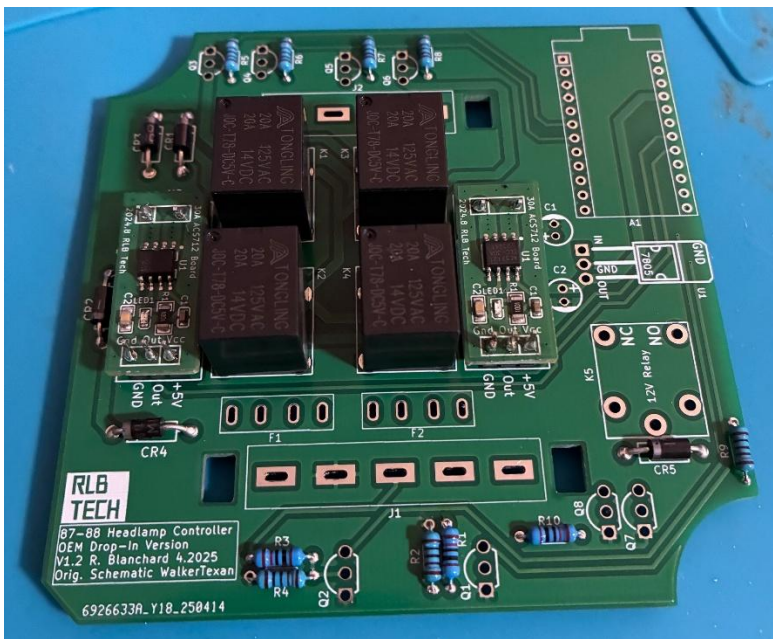
8. Install and solder the 12 volt relay in location K5
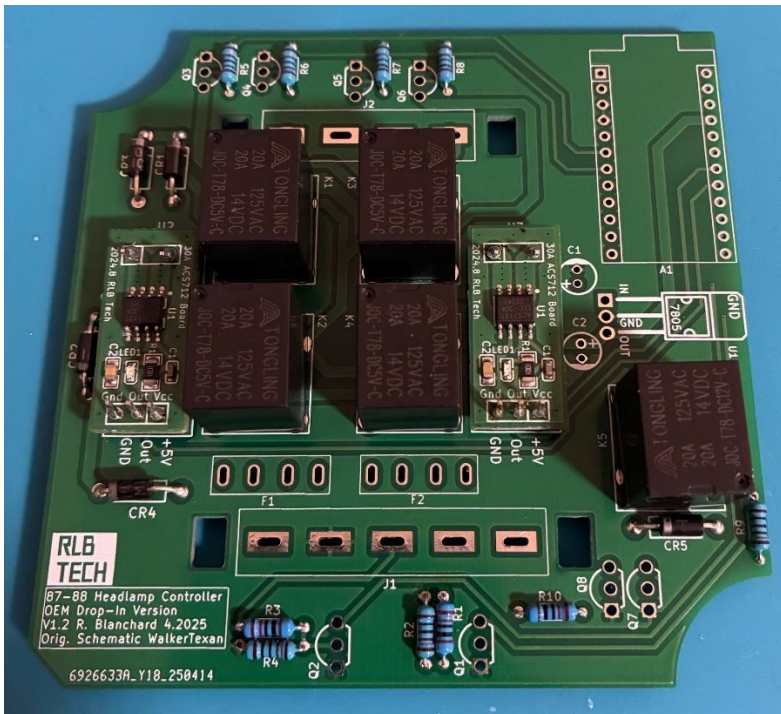


9. Install and solder all eight transistors in locations Q1-Q8. Note the illustration on the board indicates the direction of installation. (I forgot to take a picture for this step)

10. Install and solder two fuse holders at locations F1 and F2. The fuse holders can be installed in either direction, but I recommend to install as pictured. This keeps the fuses a smidge further away from the large 5 pin connector.
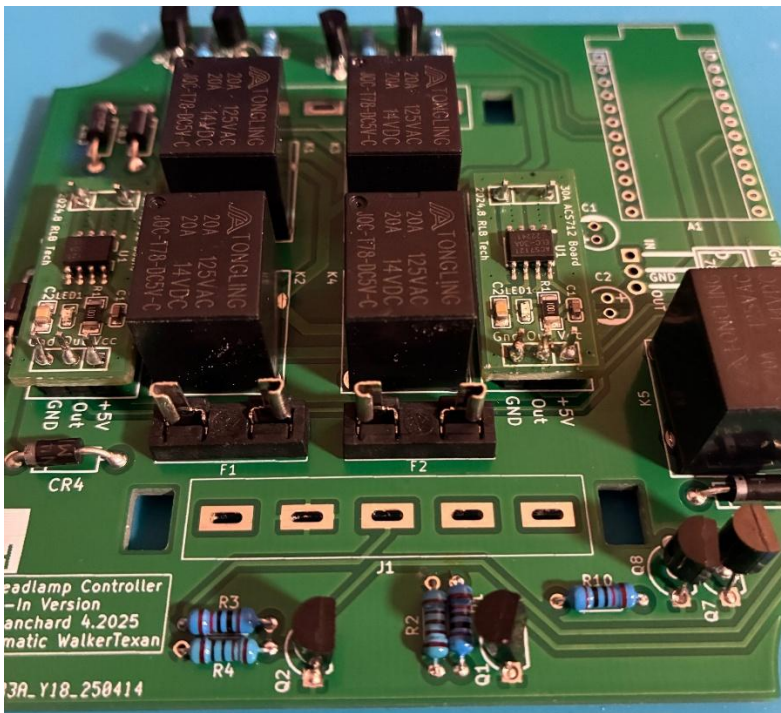
11. Insert the fuses.

12. Install and solder the voltage regulator at location U1. Gently bend it toward the edge of the board so that its height is equal to or lower than the relays.
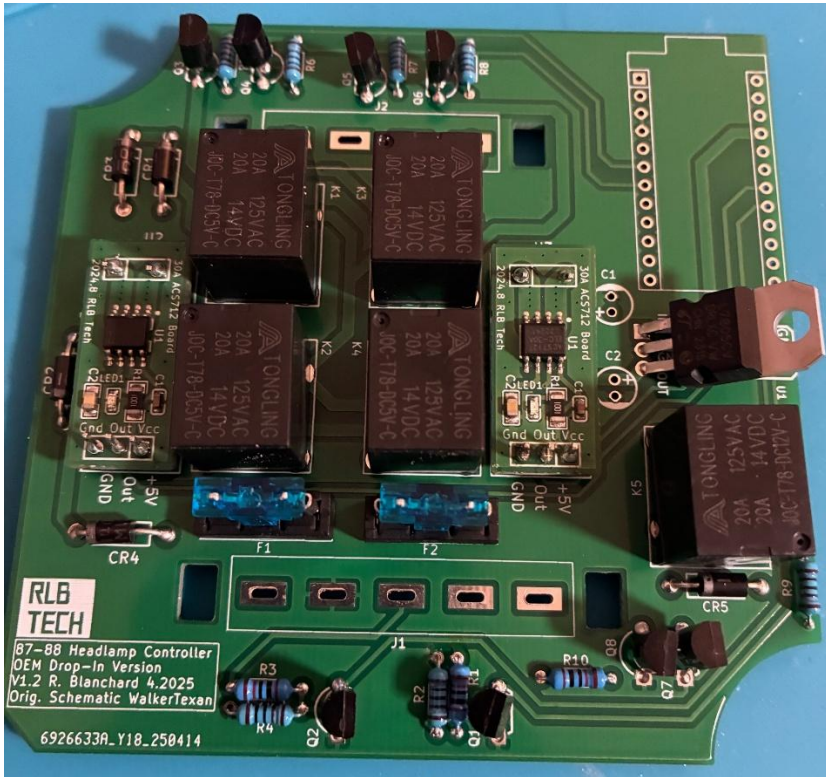


13. Install the capacitors at locations C1 and C2. Pay attention to the polarity. Negative is indicated by the shaded side of the drawing on the board.
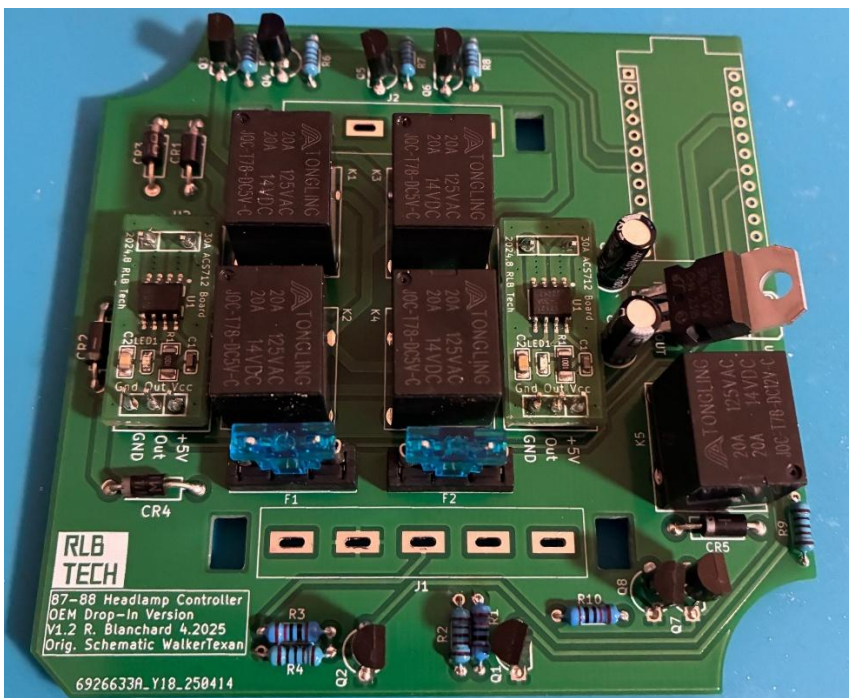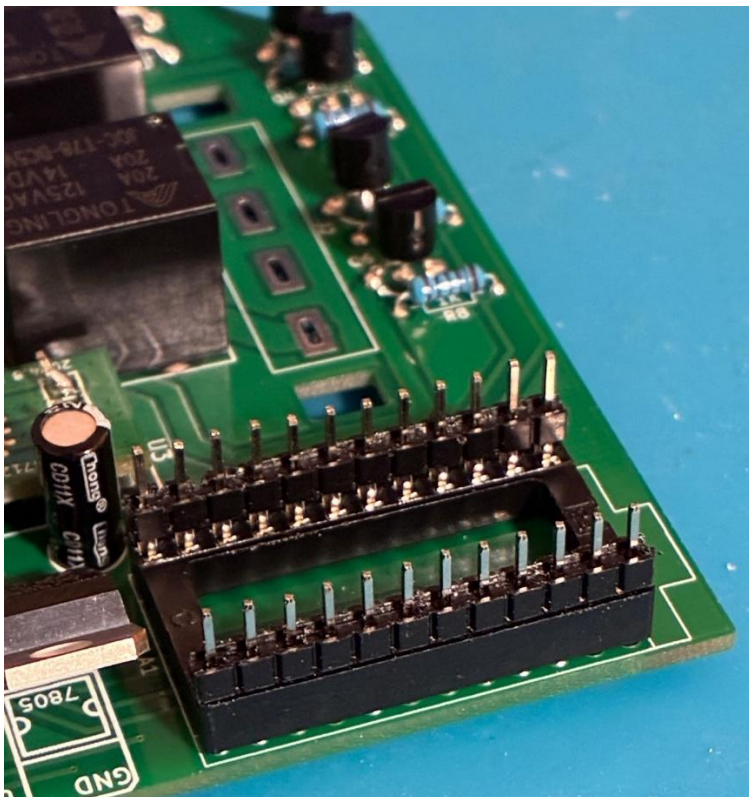
**14.** Install and solder the IC socket at location A1.
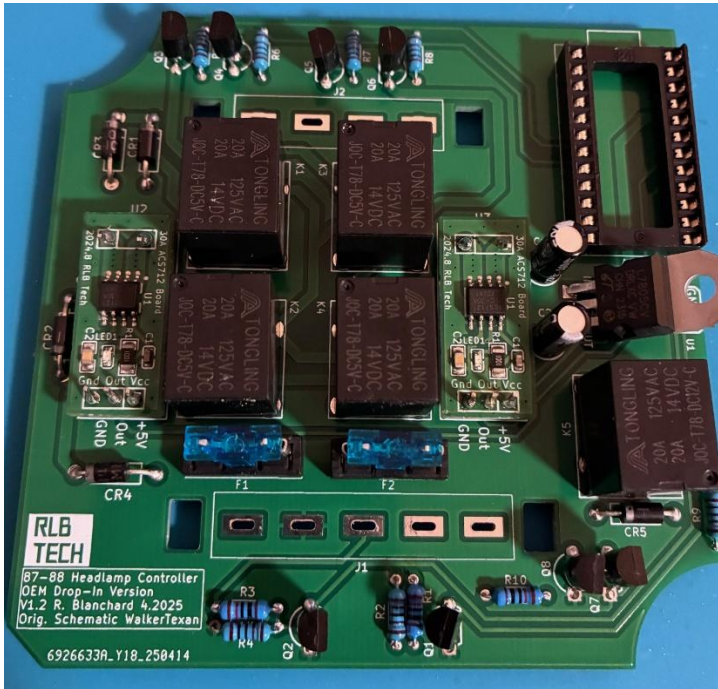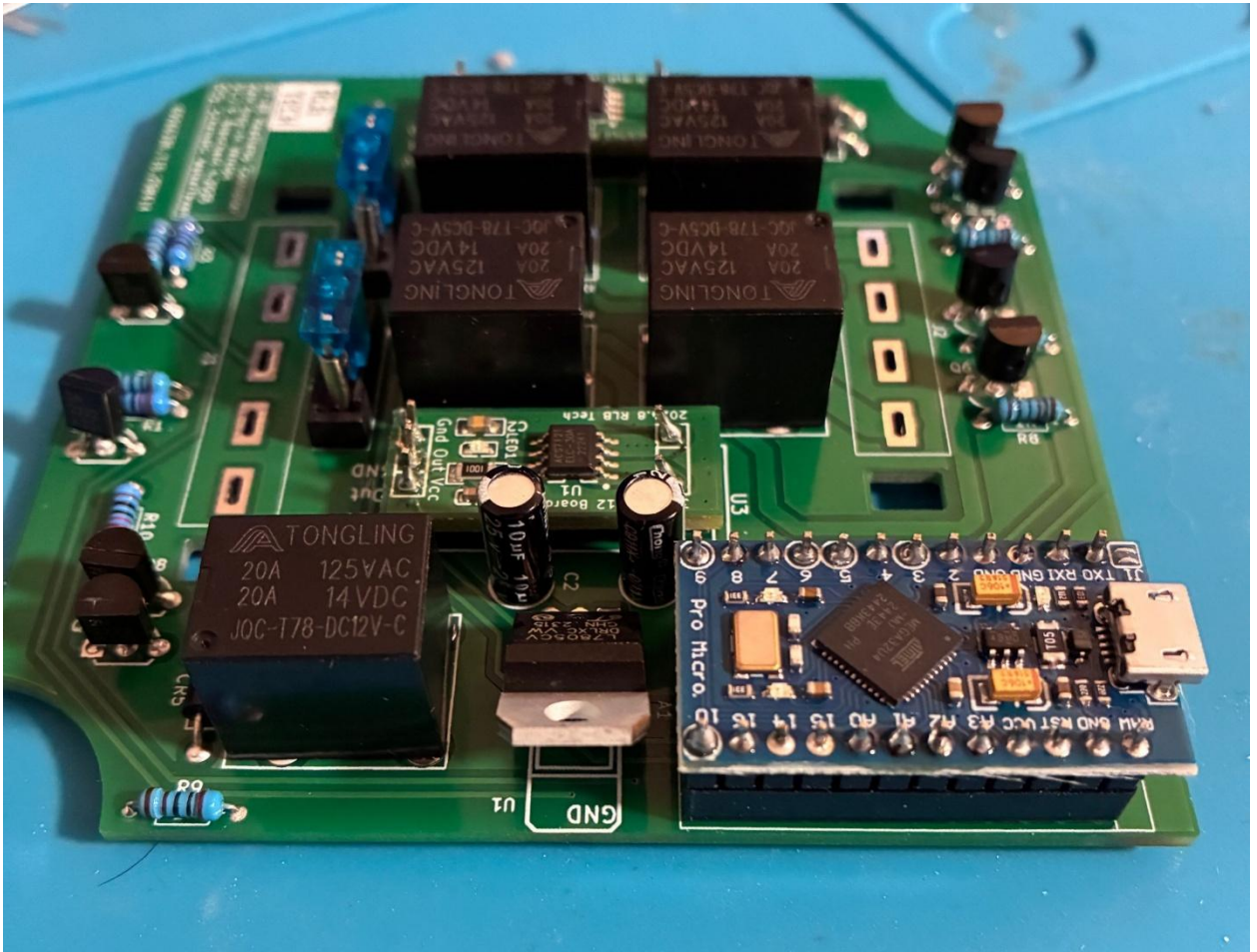


**15.** Insert the pins for your Pro Micro into the IC socket.

**16.** Work your way back and forth, pushing the plastic down on the pins until it's flush with the edge of the IC socket. This will allow us to solder the Pro Micro to its pins low enough to fit inside the case.

17. Place the Pro Micro board onto the pins and solder all pins.



18. Prepare your 4 and 5-pin headers that were removed from your original GM module. Install the 1.5 mm plastic spacers onto the solder side of the pins, then insert them into the board.
19. With both headers inserted, gently place the board into the original top module casing to properly align the pins.

    If the pins are too loose in the board and fall out, apply a very small amount of solder to a single center pin to tack it in place. You can then apply heat with your soldering iron to make adjustments and check fitment with the top case.
20. Once you are satisfied with the alignment of the pins, solder the header pins into place.
21. Assembly is now complete. Proceed to the next section: **Programming the Pro Micro**

# Programming the Pro Micro

If you do not already have it, you will need to download the Arduino IDE program from: https://www.arduino.cc/en/software/
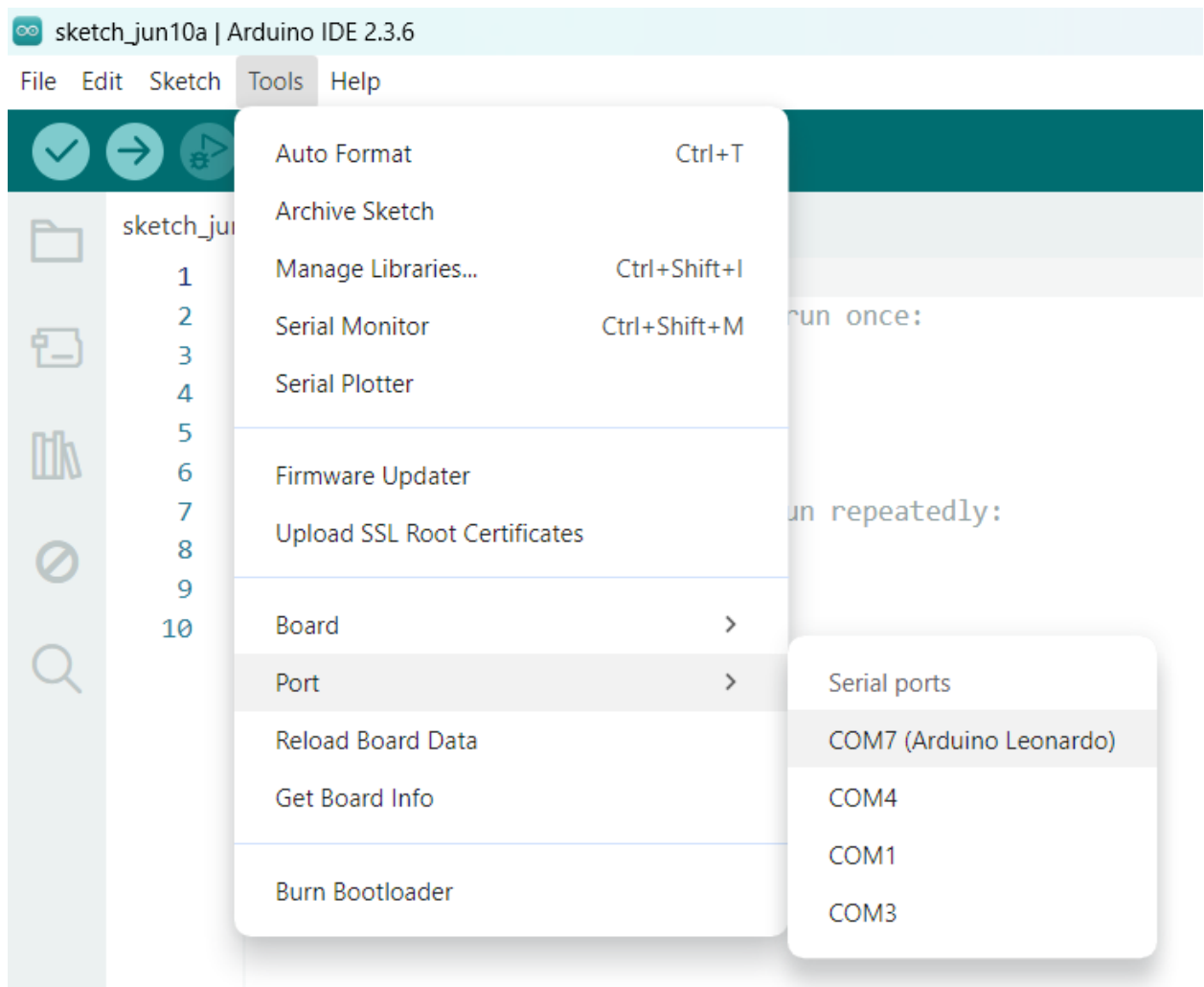
1. Launch the Arduino IDE
2. Open the Tools menu -> Board -> Arduino AVR Boards
3. Select Arduino Leonardo
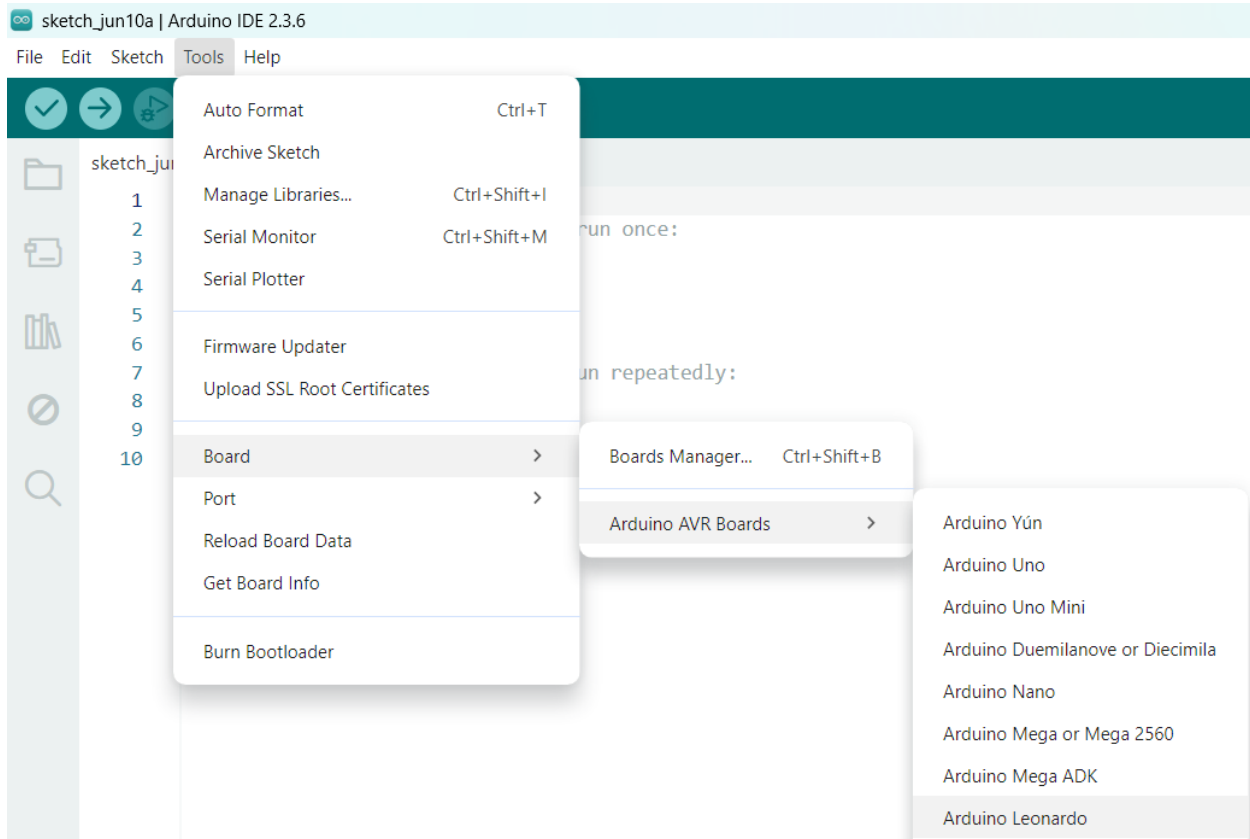


4. Connect the Pro Micro to your computer with an appropriate USB cable.
5. Open the Tools menu again and this time select Port.

6. Select the port with (Arduino Leonardo) next to it.



7. Next we need to get to program code that we want to write to the Pro Micro.

8. Visit my Github page at https://github.com/gekko3622/Fiero-Drop-In-Headlight-Module

9. Next open the "Arduino Program" folder

10. Open the file: fiero_headlight_door_cont_v2_power_relay_ino.pde then either copy the full text of the code or download the file.

11. Open fiero_headlight_door_cont_v2_power_relay_ino.pde in the Arduino IDE **OR** paste the copied code into the IDE, making sure to erase any pre-existing code before pasting.

12. Open the Sketch menu and click Upload. The IDE will the compile the code and upload it to the Pro Micro.
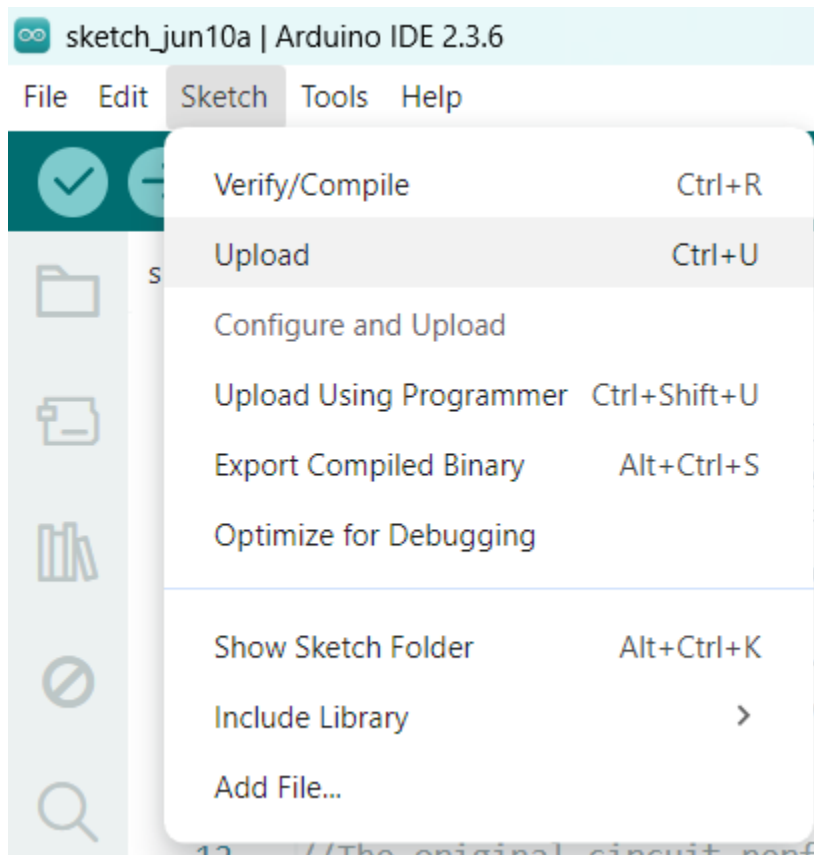


13. You should receive a message in the bottom status window indicating success.

    If you receive an error, first be sure that you copied the code in its entirety with no additional text.

    You may see a red message that appears to be an error, but as long as the "Upload completed" message pops up, it should have been successful.

14. You can test that programming was successful by plugging the Pro Micro into the module and plugging it into your USB cable. You should almost immediately hear two relays click then shortly after they will click a second time. This is the module running its start-up process, opening the headlights.

# Putting It All Together

You're in the home strech, all that's left is to modify the module case back to fit.

Sand down or break off the four center supports on the case back as shown below:
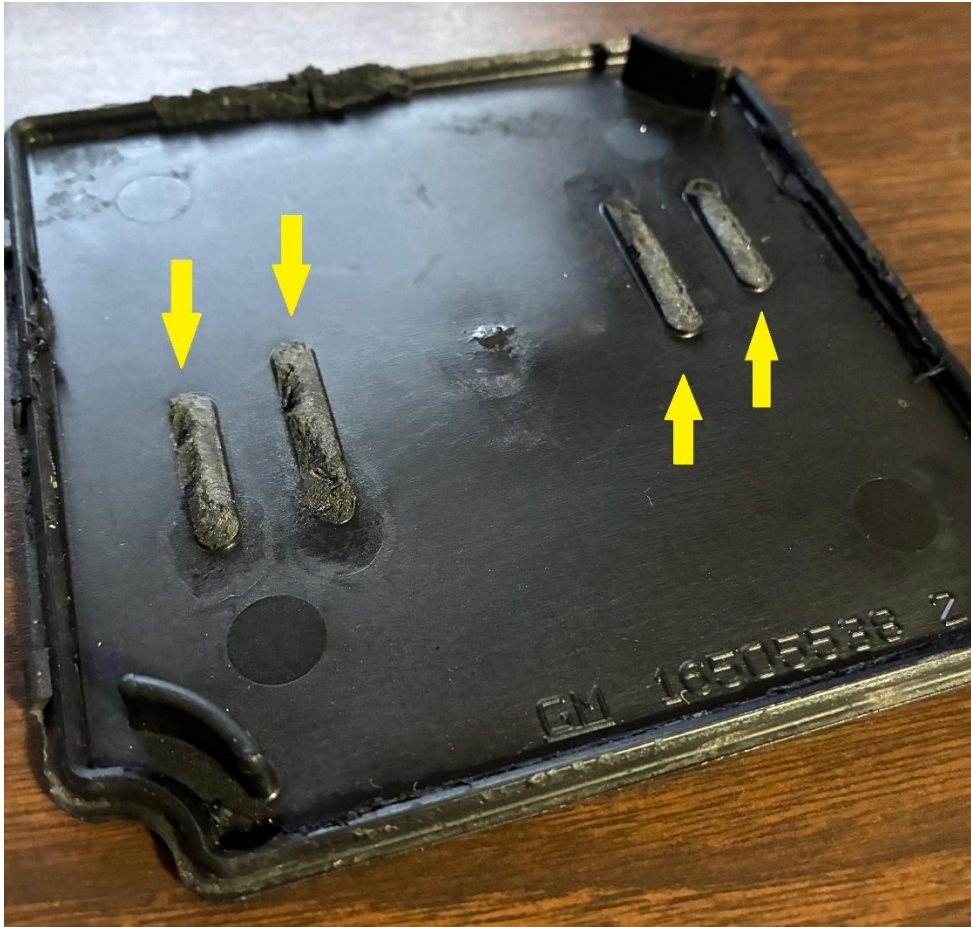


1. Place the finished module into the case and snap the back panel on.
2. Install into car and test.