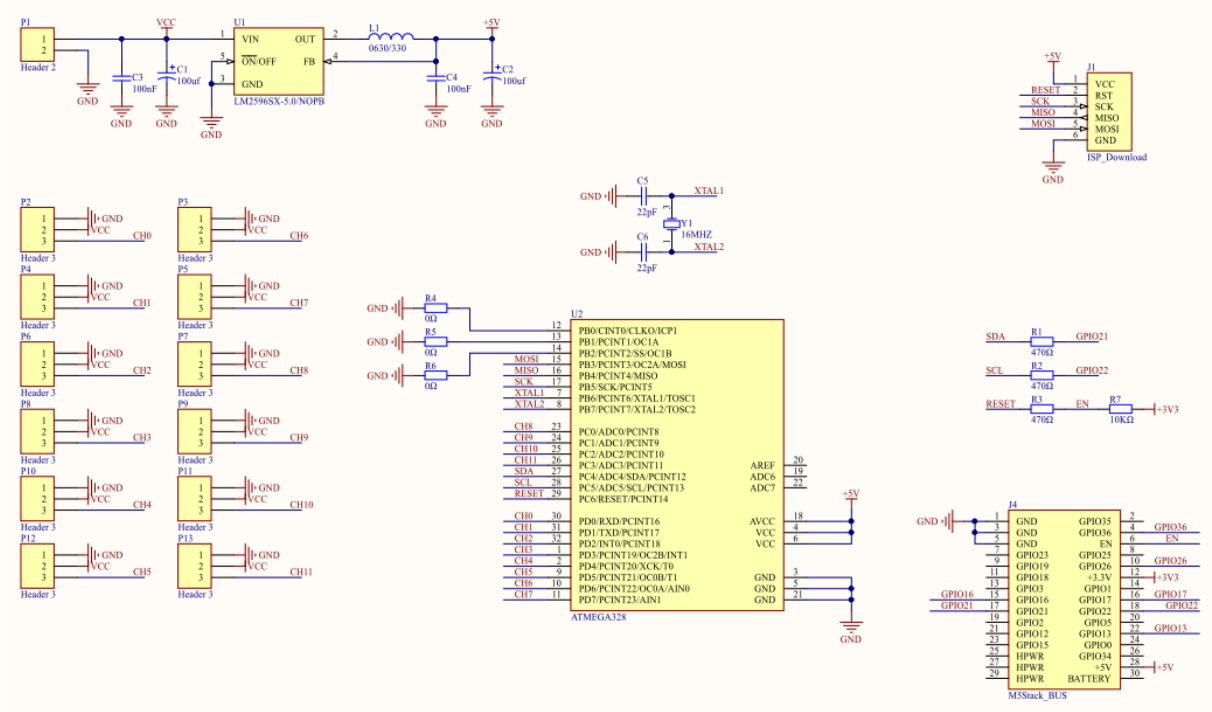
Cloning the M5Stack Servo Module.

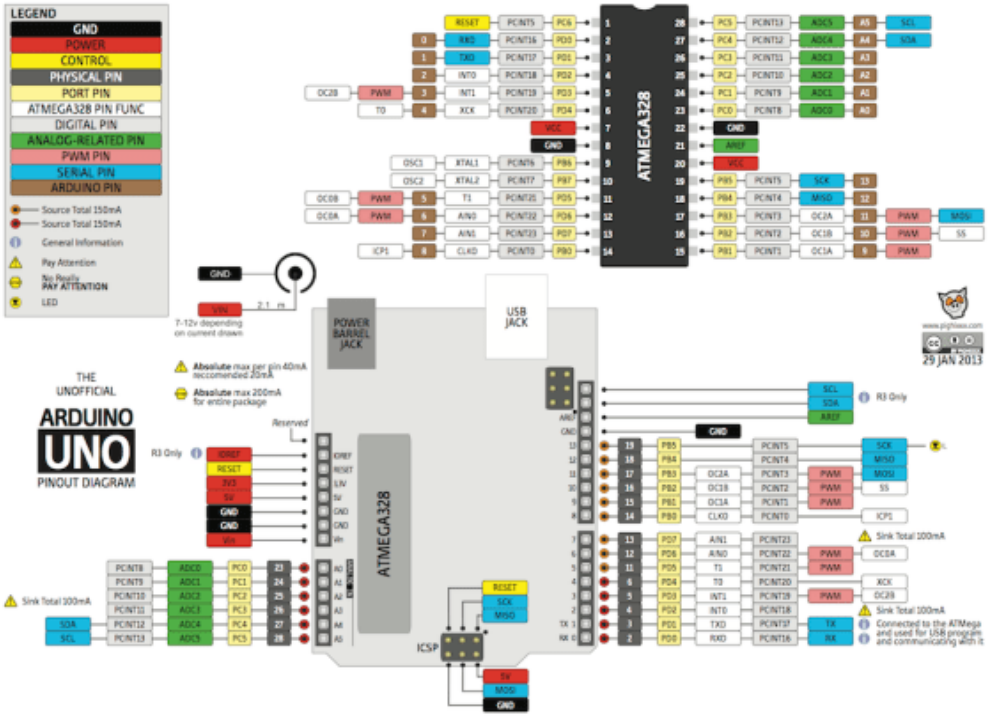
Part 1 - Prototype

M5Stack have done an amazing job making the 12 channel servo driver into such a small package however, in the process of writing my handbook, I have found it hard to track down one of the modules. Since all the hardware is open source, they have posted both the schematic and the firmware online to download for free on the M5Stack Servo Technical Page - https://docs.m5stack.com/#/en/module/servo

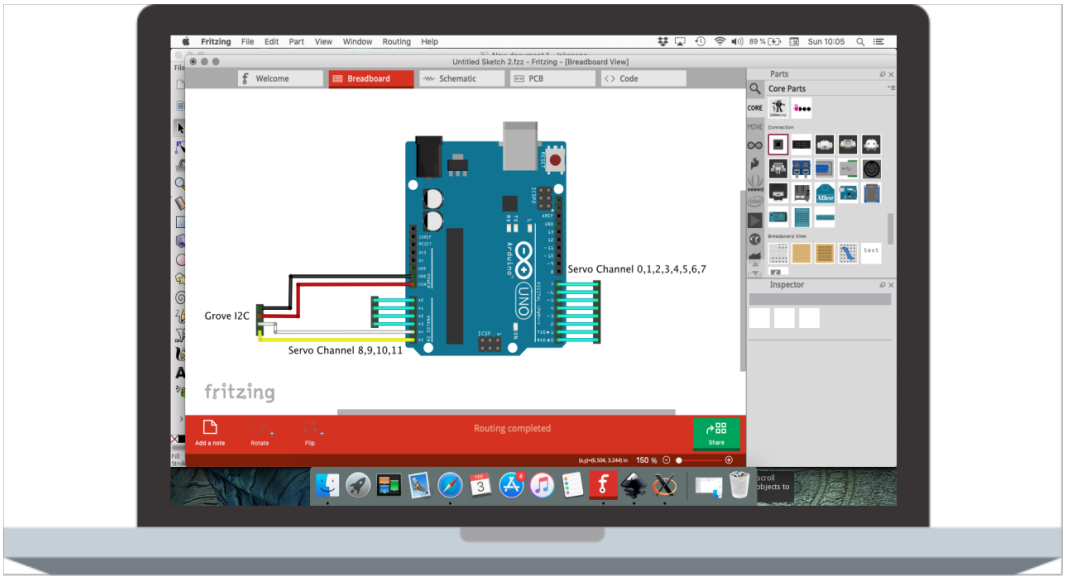
My first step was to head over to the site and download the Schematic diagram for the module. Recognising that this was built on an ATMEGA 328P, I remembered that I had an Arduino board with a few ATMEGA328P-PU and associated hardware spare. Once I had the hardware collected together I hit my first hurdle, the above diagram didn't match the markings on my Arduino board (Ok, I give, y I was having a stupid moment!), I went online and searched for a pinout for the



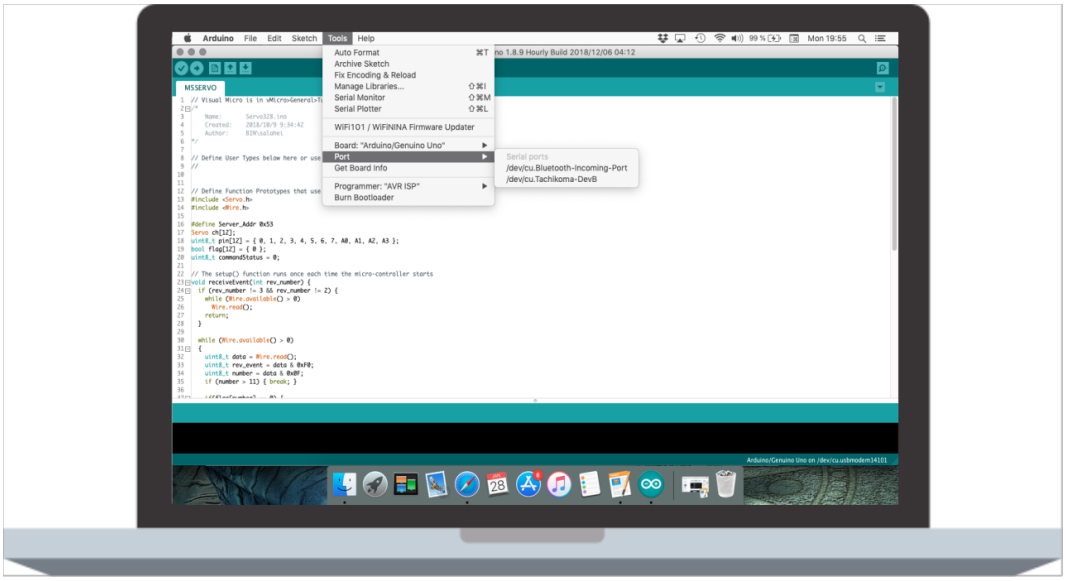
Arduino Uno Board.



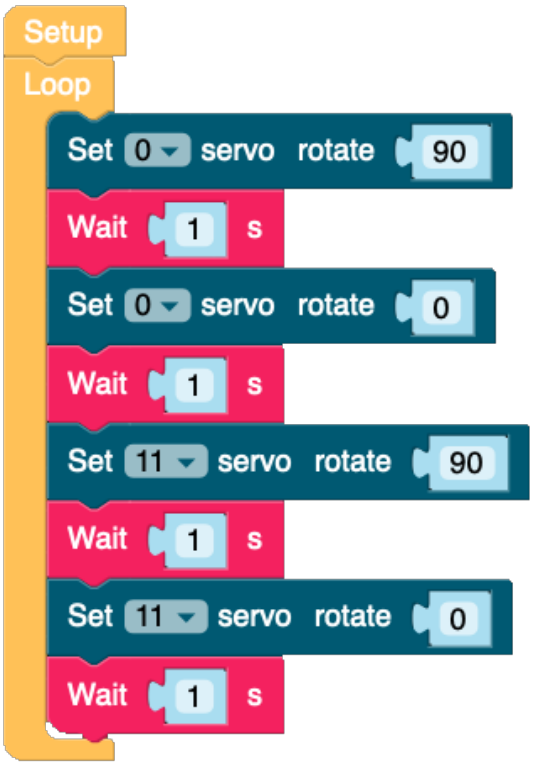
I found the above pinout and smiled as it also had the pinout for the ATMEGA328P-PU!
After an hour of looking dumbly at the two printouts for half an hour, I opened up frizzing and started playing. Once I had the following diagram and seeing how simple it was, I went and got a cold beer.



As you can see, my version is missing a few resistors compared to the schematic but, it still works with the M5Stack. I only had two servos to test it with so I connected one to channel 11 which is the top pin on the left side and channel 0 on the bottom right side.Now that we have the hardware prototype assembled, we need the firmware to run on it.
Head over to https://github.com/m5stack/M5-ProductExampleCodes/tree/master/Module/SERVO/firmware_328p and download the Servo328.ino file.



Plug the Uno into the computer and check that Arduino sees the Uno. Above the **"Port"**menu item is **"Board"** menu item, we need to make sure that is set to the Arduino/Genuino Uno board. Go to File Open and load the **Servo328.ino** file and click the second round icon from the left to compile and download to the Uno board.
If everything want ok (no error messages) we can close the Arduino software, disconnect the Uno from the pc and connect the grove lead to the M5Stack.
Now load up flow.m5stack.com and create the following code.



All the code does is move the servo horn to ninety degrees then back again on servo channels 0 and 11.

Whats next?

Now we have the working prototype, it is time to move on to the actual product design phase where we will replace the Arduino Uno with custom designed hardware.