1. HOW TO MAKE ROBOT

WALL DRAWING ROBOT (FUMIK ROBOT)

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1. Part list

No	Name	Spec	Q'ty	Link
1	Arduino Mega	-	1	https://amzn.to/3mktxVz
2	CNC shield	-	1	https://amzn.to/3NvXH48
3	Stepper module	A4988	2	https://amzn.to/3Nng4Za
4	Servo motor	SG90	1	https://amzn.to/3xgxfG2
5	Arcrylic panel	20x30x2mm, color green/yellow/white	3	https://amzn.to/3xaP48x
6	Arcrylic panel	20x30x4mm, color transparent	1	https://amzn.to/396XYM9
7	Copper spacer	22mm female-female M3	4	https://amzn.to/3meZrCY
8	Copper spacer	40mm female-female M3	4	https://amzn.to/3mc4DHV
9	Hex screw	M3x6mm (flat head)	8	https://amzn.to/38MUKNA
10	Hex screw	M3x6mm (wafer head or any head type)	13	https://amzn.to/3auvMmQ
11	Screw (mini)	M1.5x5mm	7	https://amzn.to/3xdY8ur
12	Hex screw	M5x25mm (wafer head)	8	https://amzn.to/3mh7QFX
13	Flat Washer	M5x1mm	8	https://amzn.to/3MncdK9
14	Screw	M5	10	https://amzn.to/3x7IRKj
15	Screw	M5 Self-Locking Locknut	2	https://amzn.to/3QbJNWW
16	Timing pulley	GT2 30 teeth; bore 5mm; width 6mm	2	https://amzn.to/3x7IRKj
17	Pulley 625	inner dia. 5mm; outer dia. 15mm	4	https://amzn.to/3mgaqMt
18	Timing belt	GT2 5m width 6mm	2	https://amzn.to/3mbKhyn
19	Stepper motor	28BYJ-48 12V	3	https://amzn.to/3MghVh1
20	SD card module	(for Arduino)	1	https://amzn.to/3alSAVI
21	SD card	1GB	1	https://amzn.to/3MjvoVo
22	SD card reader		1	https://amzn.to/3NoDkWA
23	Power module	DC XL4015 5A	1	https://amzn.to/3wZtDqM
24	Power module	220VAC/18VDC 1A	1	https://amzn.to/3mimpcC
25	Power cable	5m 24VDC 2A	1	-
26	USB cable	3m, USB A to B, thin cable	1	-
27	Cable	breadboard jumper 10cm f-f; m-f	6	https://amzn.to/3NXJddt
28	Paper	A4 160gsm (for mask)	1	https://amzn.to/3Q2ey07
29	Pen	3 color (erasable for white board)	1	https://amzn.to/3Q0SZgu

2. Tool

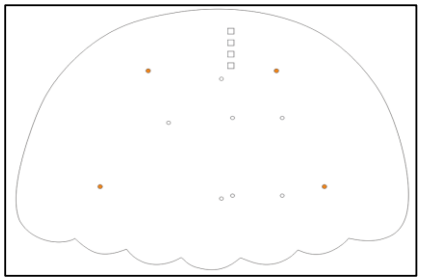
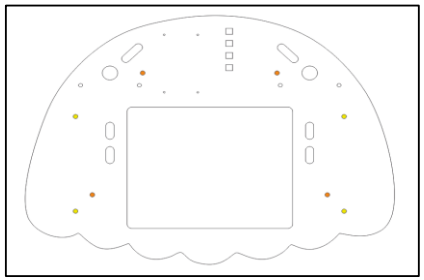
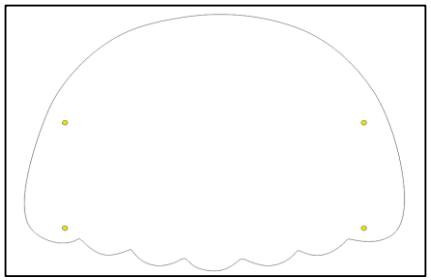
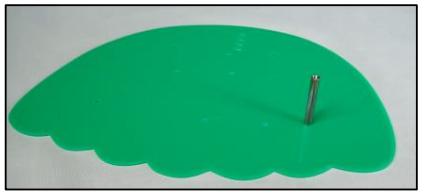
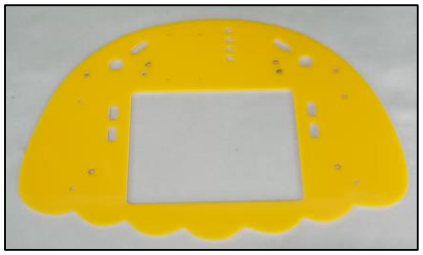
No	Name	Spec	Q'ty	Link
1	Hex driver	for M3 (2mm)	1	https://amzn.to/3MjUXWg
2	Hex driver	for M5 (3mm)	1	https://amzn.to/3MjUXWg
2	Nut wrench	5/16 (for M5 (8mm))	1	https://amzn.to/3MiYAfk
3	Driller	-	1	https://amzn.to/3zhS717
4	Laser cnc machine	CO2 50W 40x60cm	1	https://amzn.to/3GNlbzg

3. Software

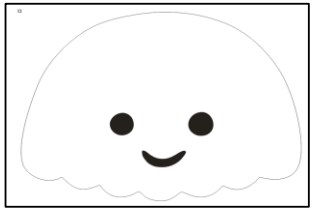
No	Name	Spec	Q'ty	Link
1	Arduino IDE	-	1	-
2	Corel draw	-	1	-
3	Microsoft Excel	-	1	-

Step 1. Cut the base/ mask (by CNC machine)

Use acrylic 20x30x2mm to cut base

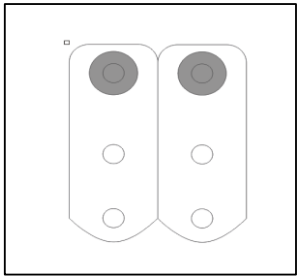
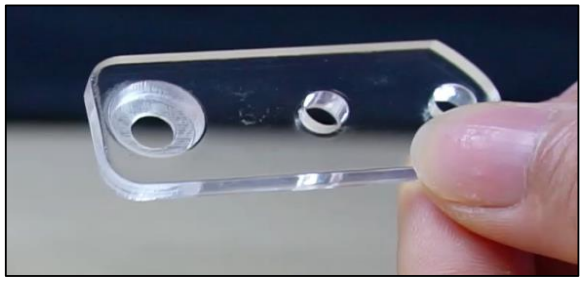
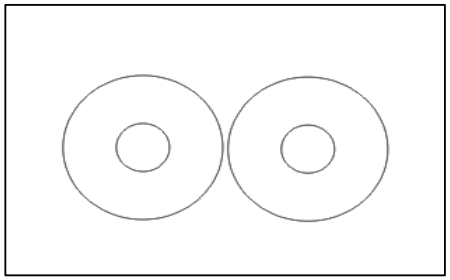







Use hard paper 20x30 to cut/ engrave mask (option: this mask can be no-need)



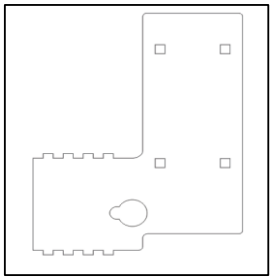
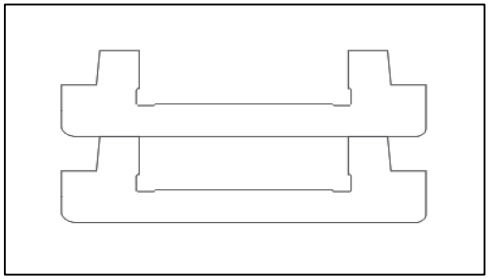
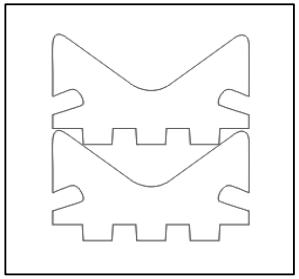
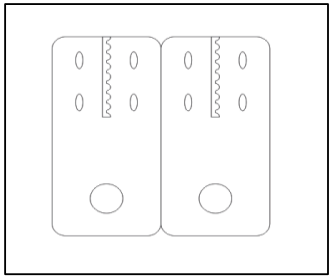
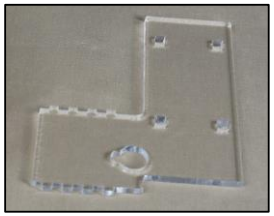
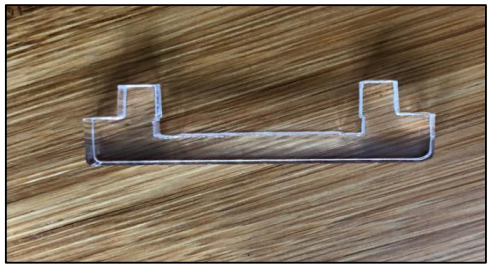

Step 2. Cut, engrave auxiliaries (by CNC machine)

Use acrylic 20x30x4mm to engrave/ cut

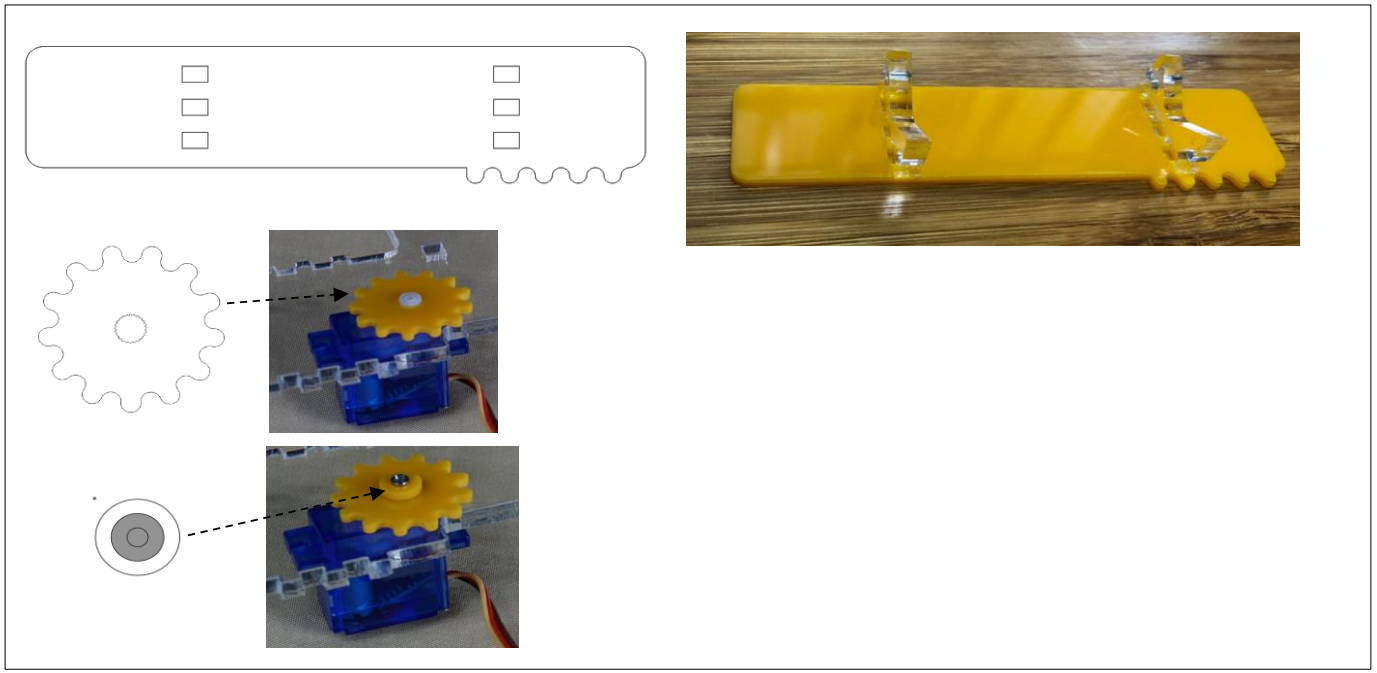





Step 3. Cut pen driver (by CNC machine)

Use acrylic 4mm thickness to cut

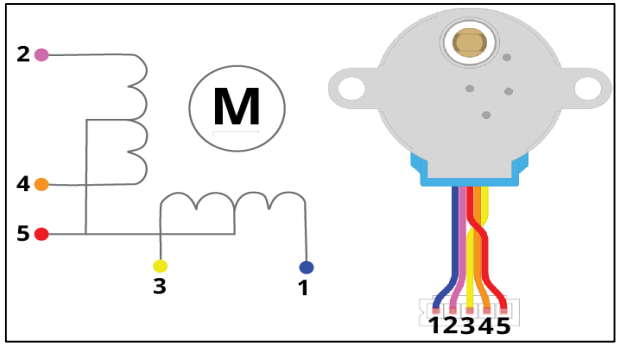







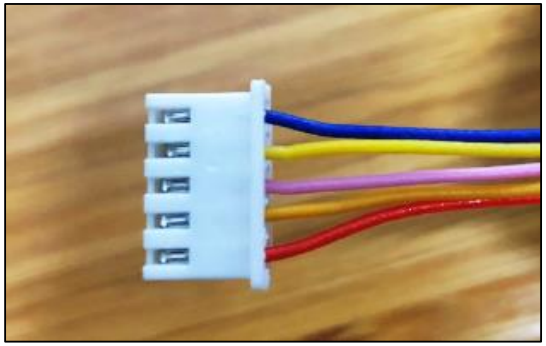
Use acrylic 2mm thickness to cut



Step 4. Prepare for wiring

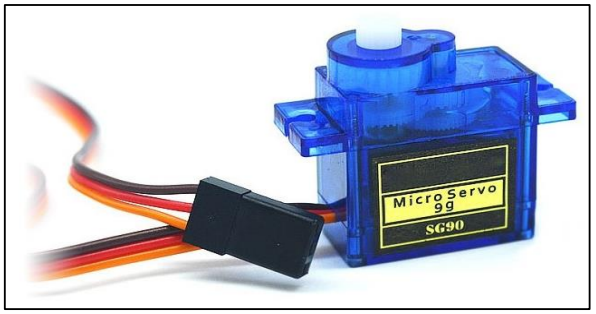
Stepper motor: origin wiring will have wiring as this picture -> we will swap cable Pink and Yellow

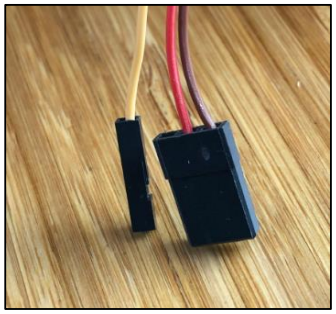




1 Blue	1 Blue
2 Pink	2 Yellow
3 Yellow	3 Pink
4 Orrange	4 Orrange
5 Red	5 Red

Servo motor SG90: seperate signal cable to new connector



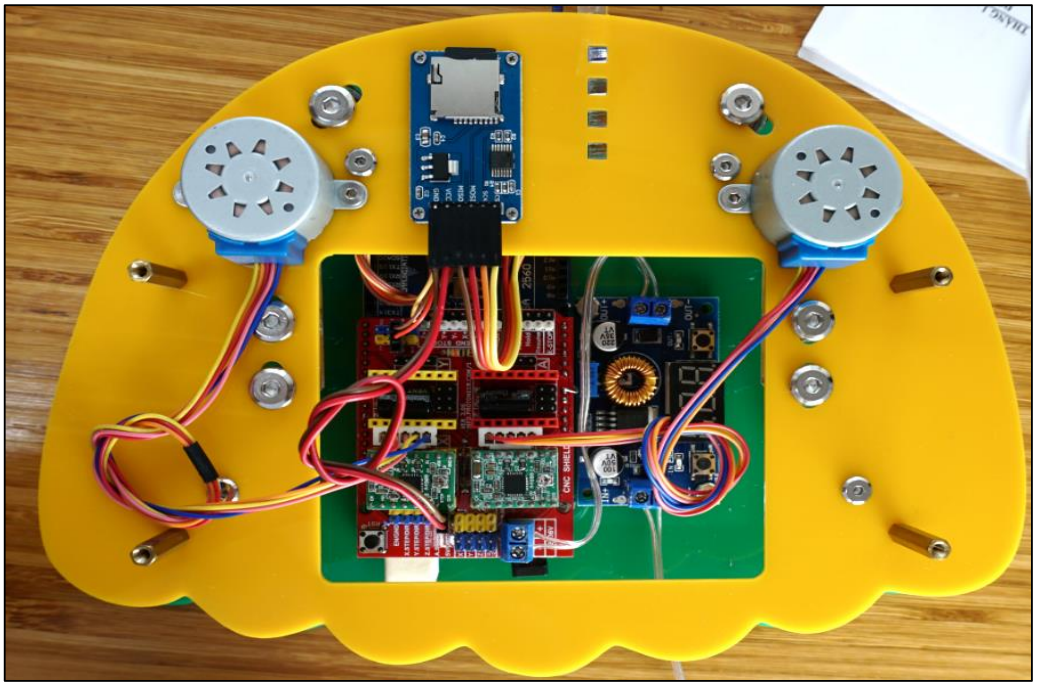


Step 5. Install all parts as in Video

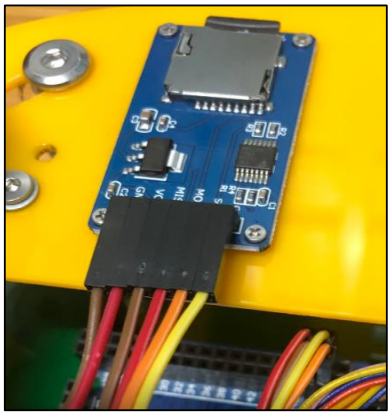
https://youtu.be/QAVDT_W5Alc

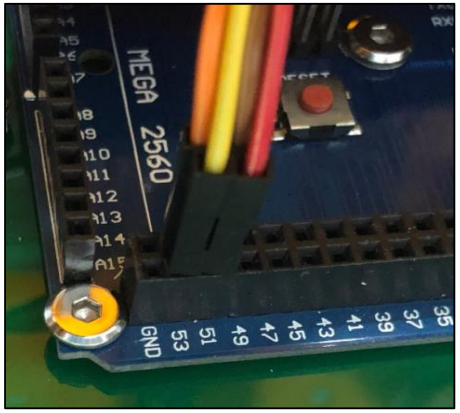
Step 6. Wiring

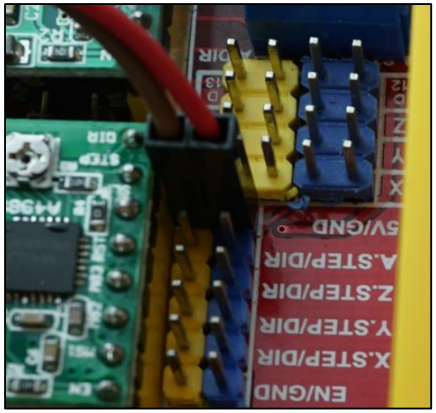
Overall view



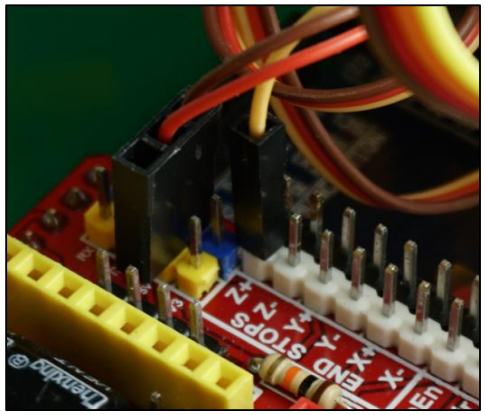
Wiring for SD card



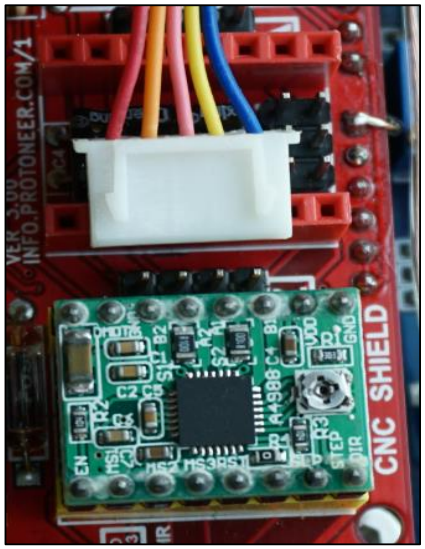


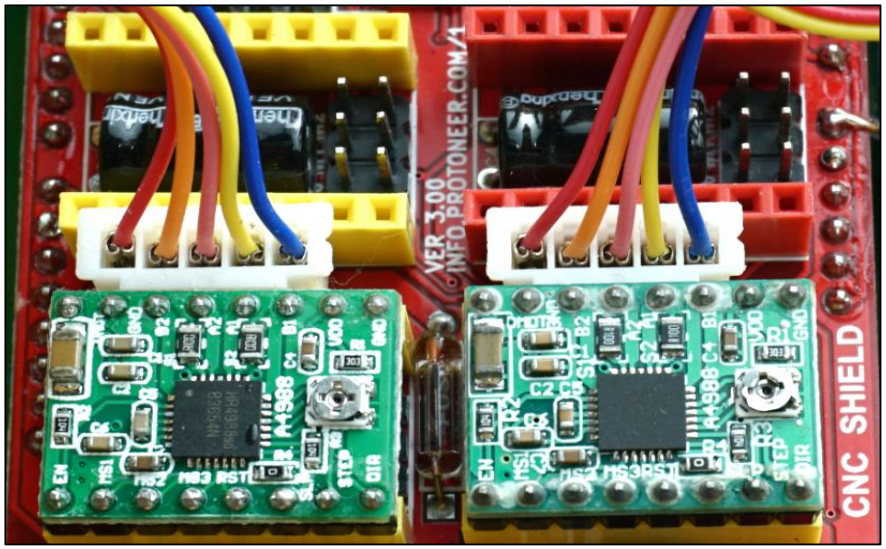


Wiring for Servo motor SG90

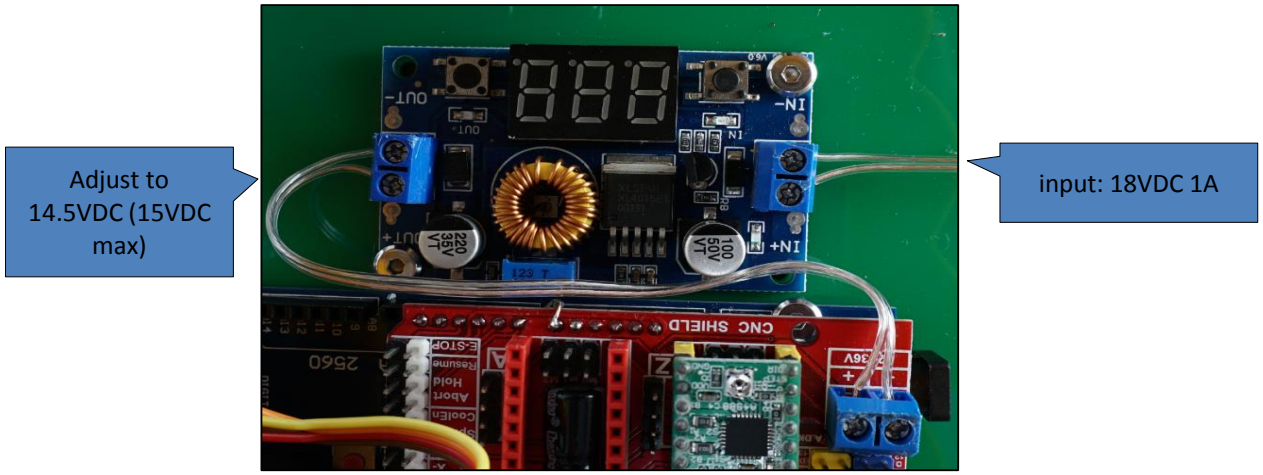


Wiring for Stepper motor (remember: red pin is NOT connected) to CNC shield)





Wiring for power



Connect USB cable to power Arduino Mega

Step 7. Download code to Arduino

https://github.com/fumikrobot/source-code/blob/main/fumik_rv9.ino

Step 8. Start drawing

see "2. How to make drawing"