Joystick Controlled 2 x RC Servo Motor-A rduino Compatible

This project enables easy control of 2 RC servo motors using a thumb joystick. This is an Arduino compatible project and it consists of a thumb joystick, ATMEGA328 microcontroller, filter capacitor on dc supply, and other components. The thumb joystick has 2 axes, X and Y. The joystick consists of 2 x 10K potentiometers. These potentiometers provide analog voltage output as per the movement of each axis. The microcontroller reads this analog voltage and converts it to RC PWM pulse. The PWM frequency is 50Hz and the duty cycle is 1ms to 2ms. Connect the RC servos to connector CN1 and CN3, apply 5V power supply to connector CN2 and you are ready to go. I have used a high-value electrolytic capacitor on DC supply for the smooth operation of RC Servo. It is important to use at least 1-3A power supply or batteries for the proper smooth operation of the servos and to avoid vibrations. It can be used to control small camera pan-tilt head, robotics, robotics arm, animatronics, toys etc.

Note: Project is Arduino compatible, Arduino code provided as a download. New ATMEGA328 requires bootloader and firmware uploading, refer to the link bellow to learn uploading the code into the chip.
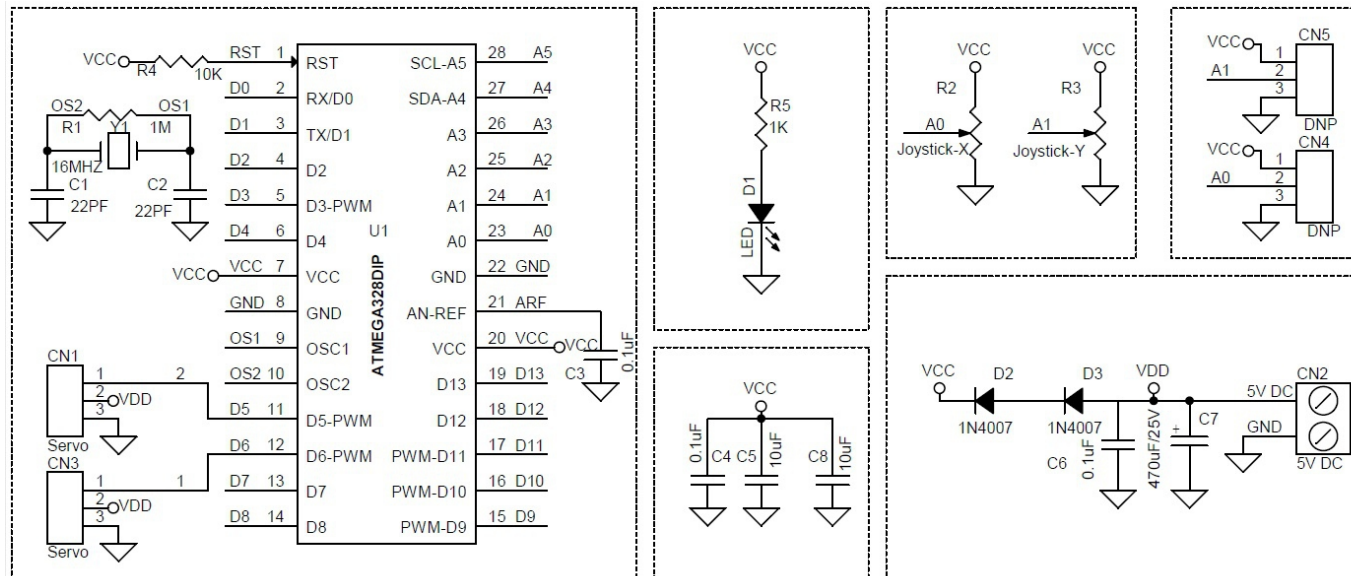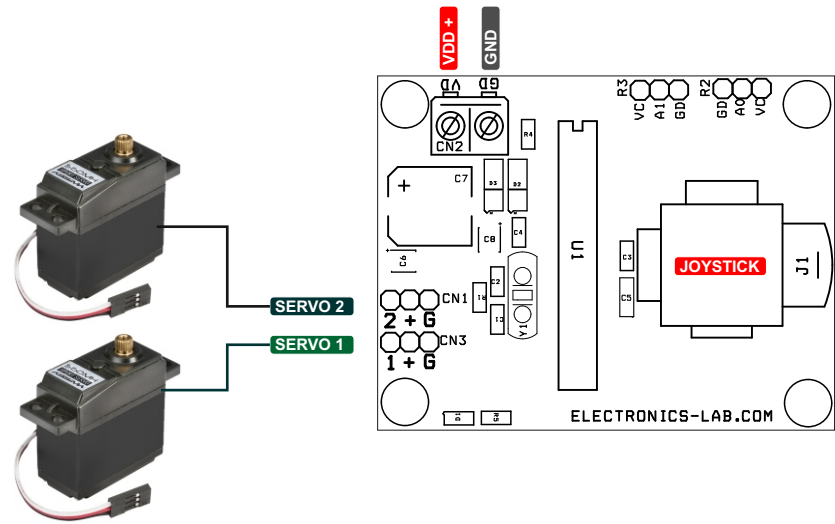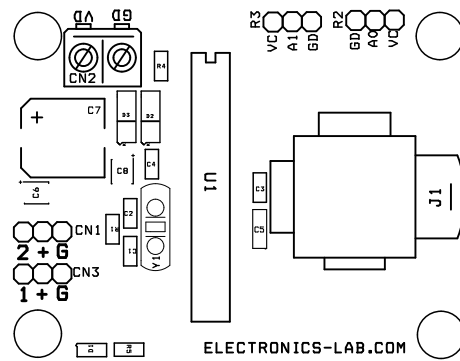
https://www.arduino.cc/en/Tutorial/BuiltInExamples/ArduinoToBreadboard

https://www.circuito.io/blog/atmega328p-bootloader/

Features
- Supply 5V DC 2Amps
- 2XRC Servo
- Power LED
- Dimensions: 61.12 x 47.63 mm

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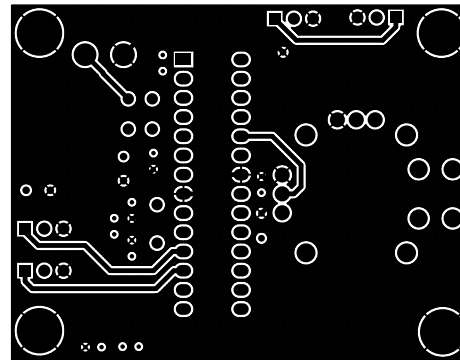VCC R4 10K RST 1 RST

OS2 R1 OS1 Y1 1M

16MHZ C1 22PF C2 22PF

D0 2 RX/D0
D1 3 TX/D1
D2 4 D2
D3 5 D3-PWM
D4 6 D4
VCC 7 VCC
GND 8 GND
OS1 9 OSC1
OS2 10 OSC2
D5 11 D5-PWM
D6 12 D6-PWM
D7 13 D7
D8 14 D8

U1 ATMEGA328DIP

SCL-A5 28 A5
SDA-A4 27 A4
A3 26 A3
A2 25 A2
A1 24 A1
A0 23 A0
GND 22 GND
AN-REF 21 ARF
VCC 20 VCC
D13 19 D13
D12 18 D12
PWM-D11 17 D11
PWM-D10 16 D10
PWM-D9 15 D9

VCC C3 0.1uF

CN1 1 2
2 VDD
3
Servo
CN3 1
2 VDD 1
3
Servo

VCC R5 1K D1 LED

VCC 0.1uF C4 C5 10uF C8 10uF

VCC R2 A0 Joystick-X
VCC R3 A1 Joystick-Y

VCC CN5 1 A1 2 3 DNP
VCC CN4 1 A0 2 3 DNP

VCC D2 1N4007 D3 1N4007 VDD C7 5V DC CN2
C6 0.1uF 470uF/25V GND 5V DC

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SERVO 2

SERVO 1

VDD +

GND

SILK SCREEN TOP

BOTTOM LAYER
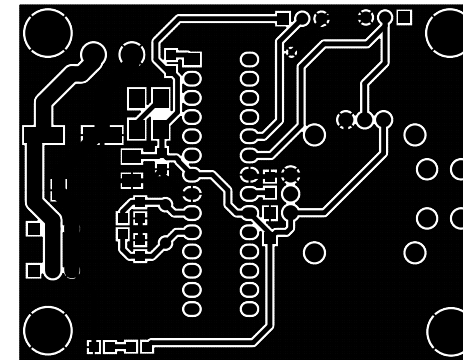
TOP LAYER

PCB DIMENSIONS 61.12MM X 47.63MM

BOM						
NO.	QNTY.	REF.	DESC.	MANUFACTURER	SUPPLIER	SUPPLIER PART NO
1	2	CN1,CN3	3 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5316-ND
2	1	CN2	2 PIN SCREW TERMINAL	PHOENIX CONNECT	DIGIKEY	277-1247-ND
3	2	CN4,CN5	DNP			OMIT
4	2	C1,C2	22PF/50V SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
5	3	C3,C4,C6	0.1uF/50V SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
6	2	C5,C8	10uF/16V SMD SIZE 1206	MURATA/YAGEO	DIGIKEY	
7	1	C7	470uF/25V ELECTROLYTIC	PANASONIC	DIGIKEY	PCE4886TR-ND
8	1	D1	LED RED SMD SIZE 0805		DIGIKEY	
9	2	D2,D3	1N4007	DIODE INCORP.	DIGIKEY	S1MBDITR-ND
10	1	R1	1M 5% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
11	2	R2,R3	Joystick	C&k	DIGIKEY	108-THB001P-ND
12	1	R4	10K 5% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
13	1	R5	1K 5% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
14	1	U1	ATMEGA328DIP	MICROCHIP	DIGIKEY	ATMEGA328-PU-ND
15	1	Y1	16MHZ	ECS INC	DIGIKEY	X1103-ND

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