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from ideas to
boards

Sound to RC Servo Driver V2.0, Arduino Compatible

SKU: EL135336

Open Source Hardware Projects

Sound to RC Servo Driver V2.0, Arduino Compatible

The project presented here is made for applications such as Animatronics, Puppeteer, sound-responsive toys, and robotics. The board is Arduino compatible and consists of LM358 OPAMP, ATMEGA328 microcontroller, microphone, and a few other components. The project moves the RC servo once receives any kind of sound. The rotation angle depends on the sound level, the higher the sound level the biggest the movement, in other words, the movement of the servo is proportional to the sound level. The microphone picks up the soundwave and converts it to an electrical signal, this signal is amplified by LM358 op-amp-based dual-stage amplifier, D1 helps to rectify the sinewave into DC, and C8 works as a filter capacitor that smooths the DC voltage. ATmega328 microcontroller converts this DC voltage into a suitable RC PWM signal.

The project is Arduino compatible and an onboard connector is provided for the boot-loader and Arduino IDE programming. Arduino code is available as a download, and Atmega328 chips need to be programmed with a bootloader before uploading the code. Users may modify the code as per requirement.
More information on burning the bootloader is here: https://www.arduino.cc/en/Tutorial/BuiltInExamples/ArduinoToBreadboard

> **i** **Direct Audio Input:**   The audio input signal should not exceed 5V, It is important to maintain the input audio signal at this maximum level, otherwise it can damage the ADC of ATMEGA328.

Features

- Supply 5V to 6V DC (Battery Power Advisable)
- RC Servo Movement 180 Degree with Loud sound
- Direct Sound Input Facility Using 3.5MM RC Jack
- On Board Jumper Selection for Micro-Phone Audio or External Audio Signal
- On Board Trimmer Potentiometer to Adjust the Signal sensitivity
- Flexible Operation, Parameters Can be Change using Arduino Code
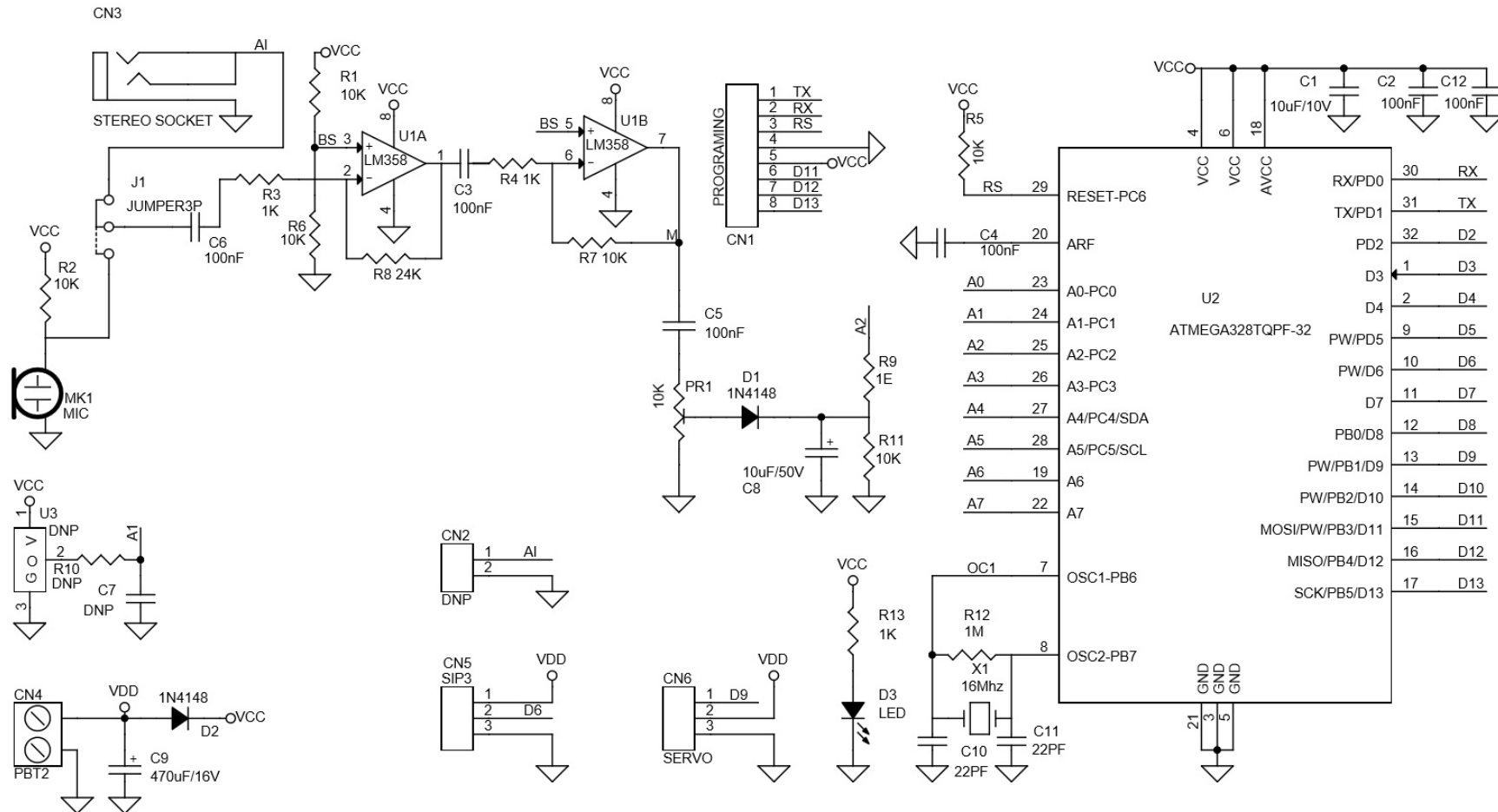- PCB Dimensions 44.45 X 36.20 MM

ⓘ Project is Arduino compatible, onboard connector provided for boot-loader and Arduino IDE programming, Arduino code available as download, Atmega328 chips needs boot-loader before uploading the code. User may modify the code as per requirement.
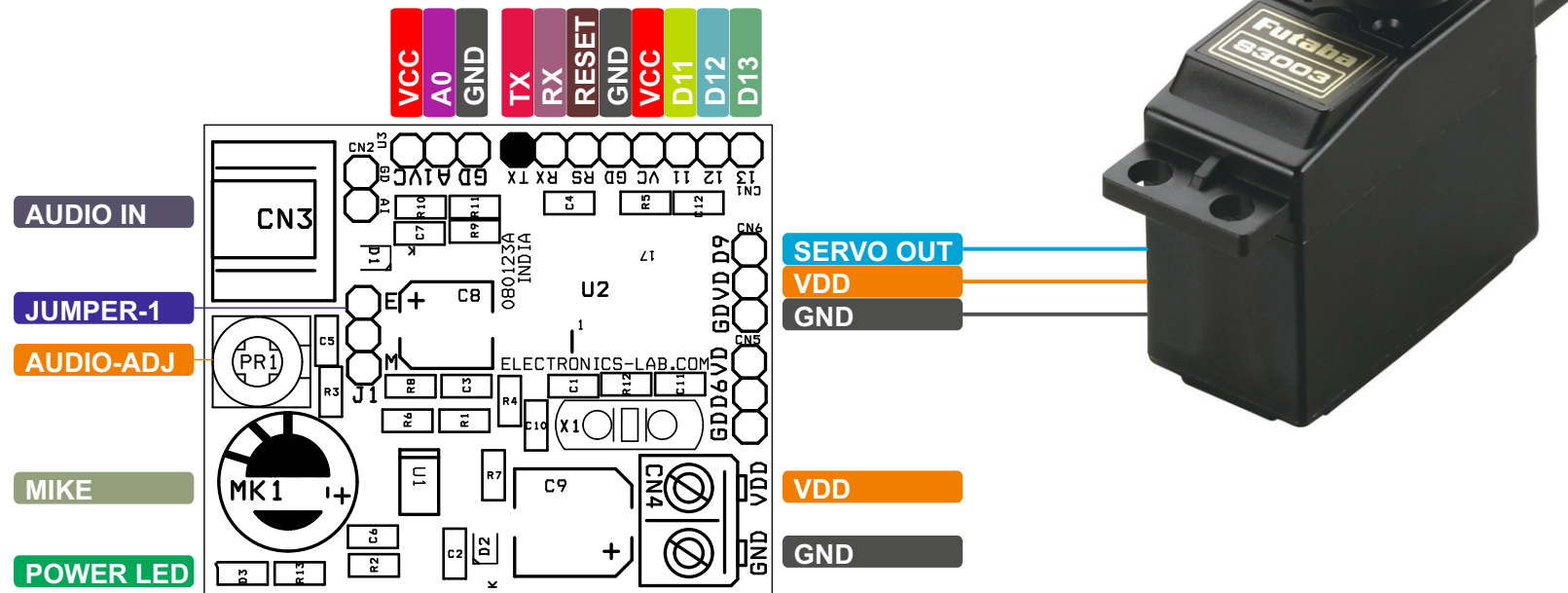
ⓘ Direct Audio Input: Audio input signal should not exceed 5V, it is important to maintain input audio signal, otherwise it can damage the ADC of ATMEGA328.

Schematic

Connections

AUDIO IN

JUMPER-1

AUDIO-ADJ

MIKE

POWER LED

VCC · A0 · GND · TX · RX · RESET · GND · VCC · D11 · D12 · D13

SERVO OUT

VDD

GND

VDD

GND

Connections and Other Details

- CN1 Arduino Programming and Boot-Load Connector: Pin 1 = TX, Pin 2 = RX, Pin 3 = Reset, Pin 4 = GND, Pin 5 = VCC 5V DC, Pin 6 = D11, Pin 7 = D12, Pin 8 = D13
- Cn2 Direct Audio Input: Optional, Pin 1 Audio from External Speaker, Pin 2 = GND
- CN3 Stereo EP 3.5MM Female Connector for External Audio Signal Input from Speaker
- CN4 DC Input: Pin 1 VDD 5V to 6V DC, Pin 2 GND
- CN5: No USE – Optional
- CN6: RC Servo
- Jumper J1: Input Signal Source Selection (External Audio Signal or Microphone)
- PR1 Trimmer Potentiometer: Audio Signal Level Adjust
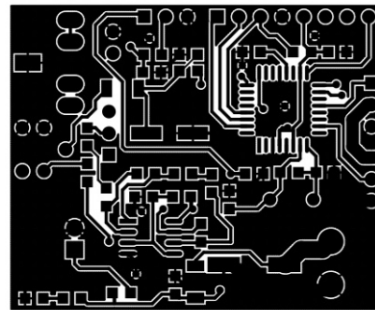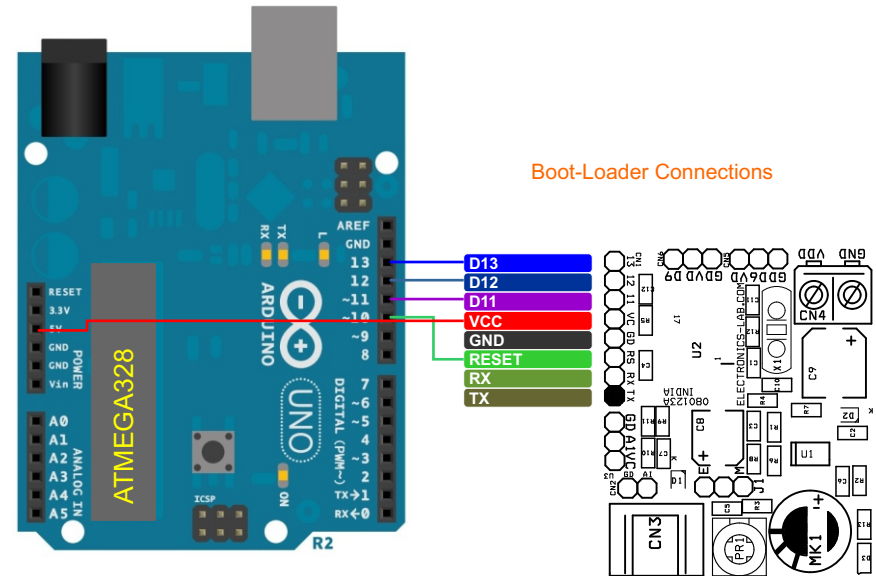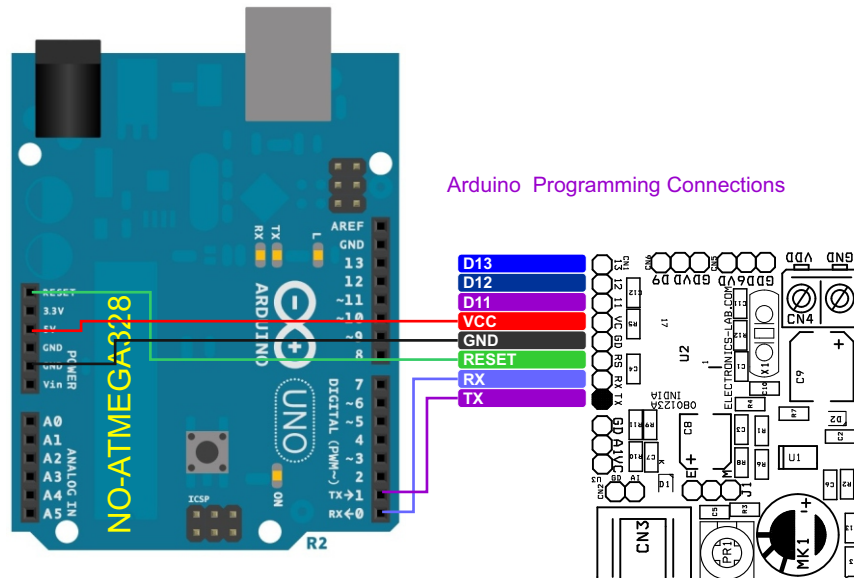- Mk1: Condenser Microphone

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PCB

PCB GERBER FILES AVAILABLE
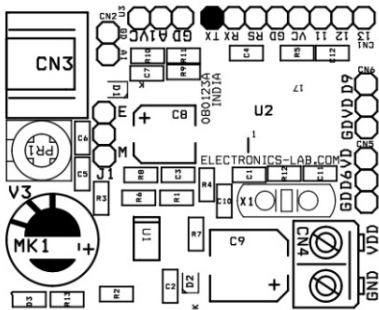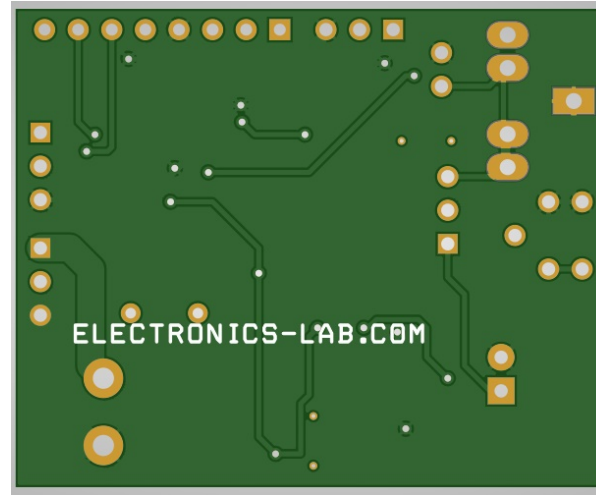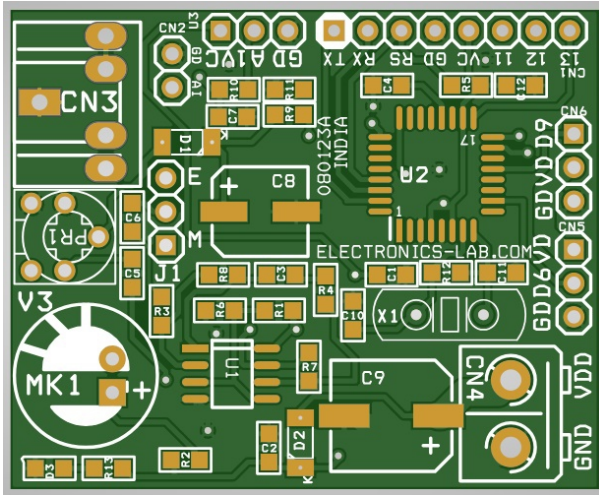
SILK SCREEN TOP
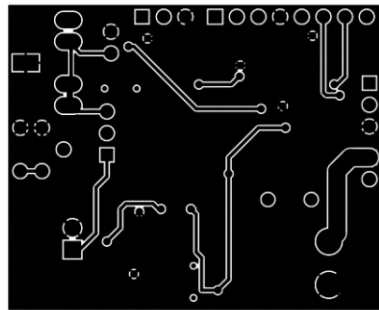
BOTTOM LAYER

TOP LAYER

PCB DIMENSIONS 44.45 x 36.20 mm

Parts List

NO	QNTY.	REF.	DESC.	MANUFACTURER	SUPPLIER	SUPPLIER PART NO
			BOM			
1	1	CN1	8 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5321-ND
2	1	CN2	2 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5315-ND
3	1	CN3	STEREO SOCKET 3.5MM FEMALE	CUI DEVICES	DIGIKEY	CP1-3525N-ND
4	1	CN4	2 PIN SCREW TERMINAL PITCH 5.08MM	PHOENIX	DIGIKEY	277-1247-ND
5	1	CN5	3 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5316-ND
6	1	CN6	3 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5316-ND
7	1	C1	10uF/10V CERAMIC SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
8	6	C2,C3,C5,C12,C4,C6	100nF/50V CERAMIC SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
9	1	SHUNT	SHUNT FOR JUMPER	SULLINS CONNCT	DIGIKEY	S9001-ND
10	3	U3,C7,R10	DNP			
11	1	C8	10uF/50V SMD ELECTROLYTIC	WURTH	DIGIKEY	732-8451-1-ND
12	1	C9	470uF/16V SMD ELECTROLYTIC	ELITE	DIGIKEY	4191-CEE1C471MCB08A5CT-ND
13	2	C10,C11	22PF/50V SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
14	2	D1,D2	1N4148 SMD	ONSEMI	DIGIKEY	FDLL4148CT-ND
15	1	D3	LED RED SMD SIZE 0805	LITE ON INC	DIGIKEY	160-1427-1-ND
16	1	J1	3 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5316-ND
17	1	MK1	CONDENSOR MICE	PUI AUDIO	DIGIKEY	668-1484-ND
18	6	R1,R2,R5,R6,R7,R11	10K 5% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
19	3	R3,R4,R13	1K 5% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
20	1	R8	24K 5% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
21	1	R9	1E 5% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
22	1	R12	1M 5% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
23	1	U1	LM358 SMD SOIC8	TI	DIGIKEY	296-18457-1-ND
24	1	U2	ATMEGA328TQPF-32	MICROCHIP	DIGIKEY	ATMEGA328PB-AURCT-ND
25	1	X1	16Mhz	ECS INC	DIGIKEY	X1103-ND
26	1	PR1	10K TRIMMER POT	KYOCERA	DIGIKEY	478-601030-ND

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Arduino Programming Connections

| D13 |
| D12 |
| D11 |
| VCC |
| GND |
| RESET |
| RX |
| TX |

Boot-Loader Connections

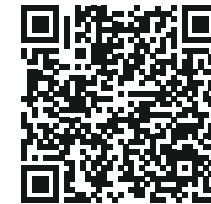| D13 |
| D12 |
| D11 |
| VCC |
| GND |
| RESET |
| RX |
| TX |

Notes

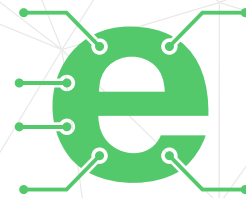## APP

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Android App

DOWNLOAD

Android App launched in 2017 and has 100k+ downloads - rated with 4.5 stars.

SCAN QR CODE

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