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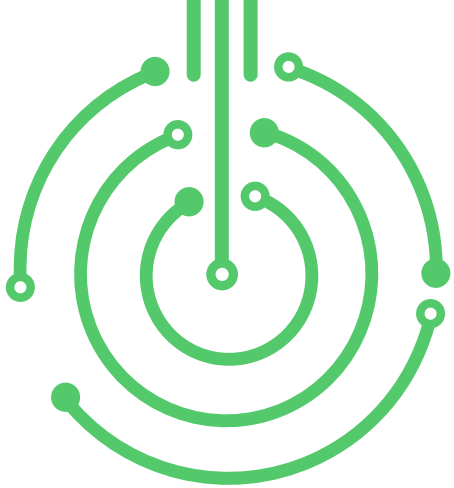


Sound to RC Servo Driver V2.0, Arduino Compatible

SKU: EL135336

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

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.

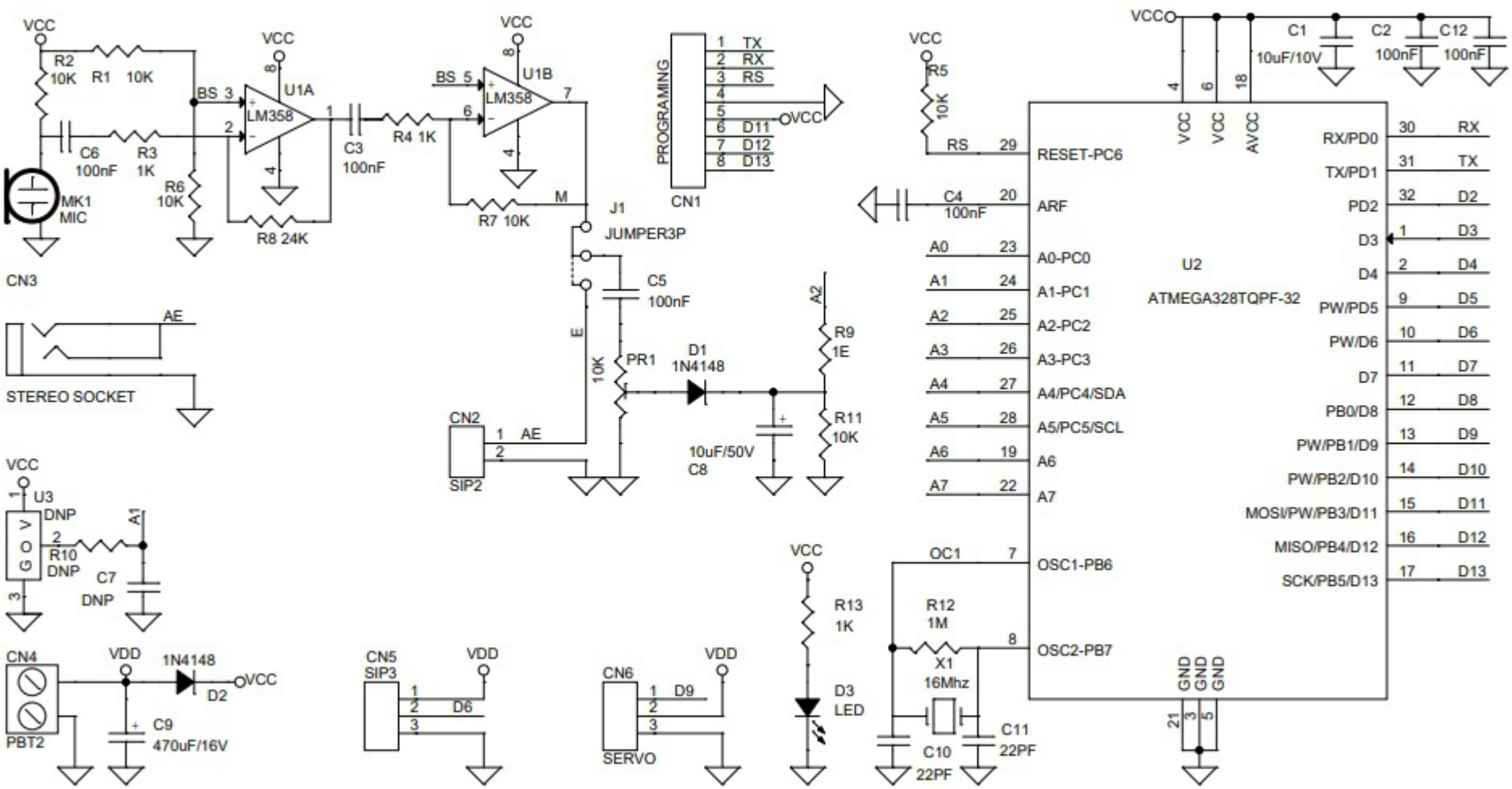
Features

- 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

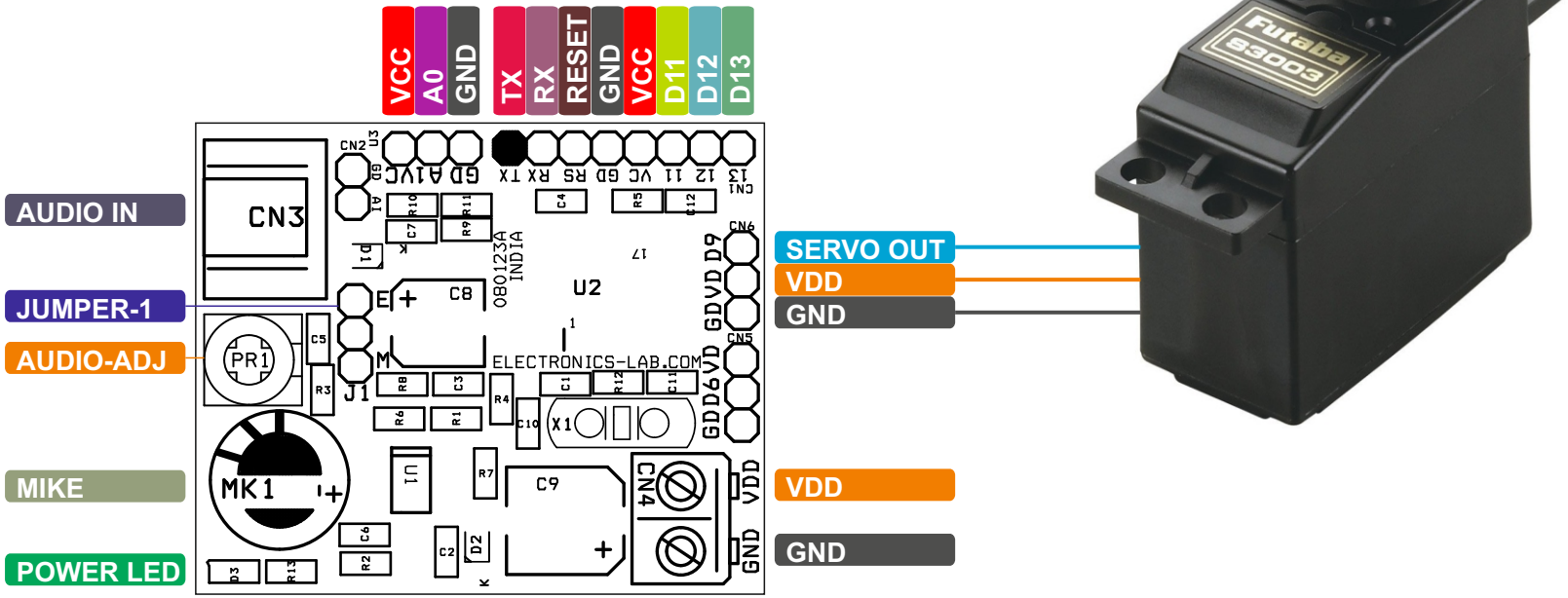
Project is Arduino compatible, onboard connector provided for boot-loader and Arduino IDE programming, Arduino code available as download, Atmega328 chips needs boot-loader before uploading the code. User may modify the code as per requirement.

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


VCC
R2 10K
R1 10K
BS 3
U1A
LM358
C6 100nF
R3 1K
R6 10K
MK1 MIC
R8 24K
C3 100nF
R4 1K
BS 5
U1B
LM358
R7 10K
M
J1
JUMPER3P
CN3
AE
STEREO SOCKET
C5 100nF
E
10K
PR1
D1 1N4148
A2
R9 1E
R11 10K
CN2
1 AE
2
SIP2
10uF/50V C8
PROGRAMING
1 TX
2 RX
3 RS
5
6 D11
7 D12
8 D13
CN1
VCC
R5 10K
RS 29
RESET-PC6
C4 100nF
20 ARF
A0 23 A0-PC0
A1 24 A1-PC1
A2 25 A2-PC2
A3 26 A3-PC3
A4 27 A4/PC4/SDA
A5 28 A5/PC5/SCL
A6 19 A6
A7 22 A7
U2
ATMEGA328TQPF-32
C1 10uF/10V
C2 100nF
C12 100nF
4 VCC
6 VCC
18 AVCC
RX/PD0 30 RX
TX/PD1 31 TX
PD2 32 D2
D3 1 D3
D4 2 D4
PW/PD5 9 D5
PW/D6 10 D6
D7 11 D7
PB0/D8 12 D8
PW/PB1/D9 13 D9
PW/PB2/D10 14 D10
MOSI/PW/PB3/D11 15 D11
MISO/PB4/D12 16 D12
SCK/PB5/D13 17 D13
OC1 7 OSC1-PB6
8 OSC2-PB7
R12 1M
X1 16Mhz
C10 22PF
C11 22PF
21 GND
3 GND
5 GND
U3
DNP
R10 DNP
C7 DNP
A1
CN4
PBT2
VDD
1N4148
D2
VCC
C9 470uF/16V
CN5
SIP3
1
2 D6
3
CN6
1 D9
2
3
SERVO
R13 1K
D3 LED

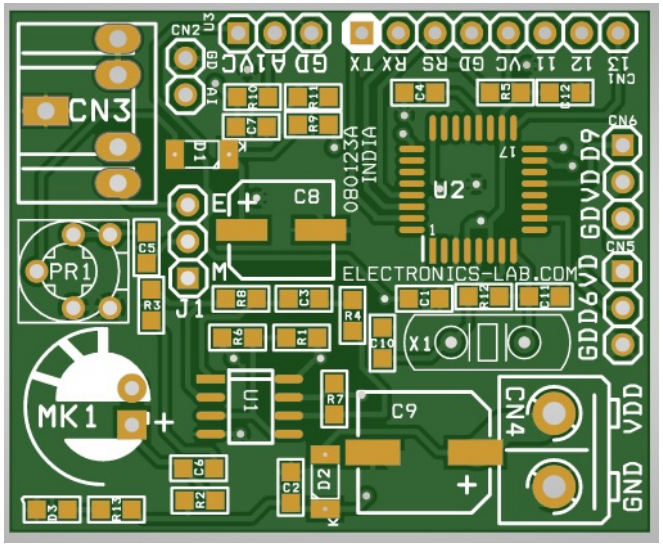
Connections

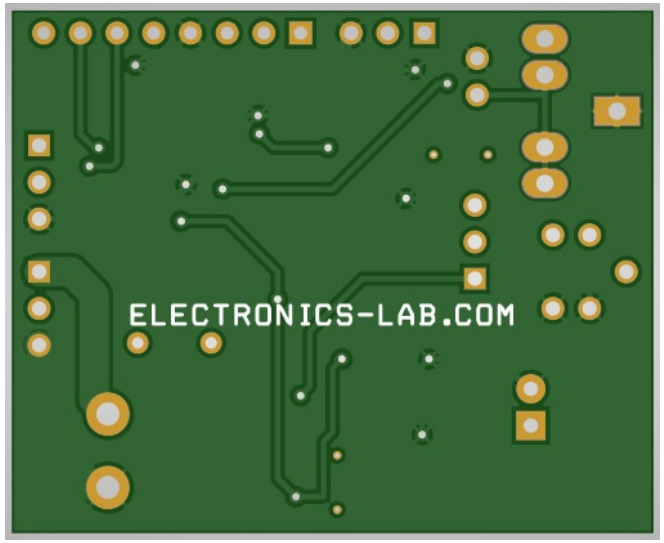


Connections and Other Details

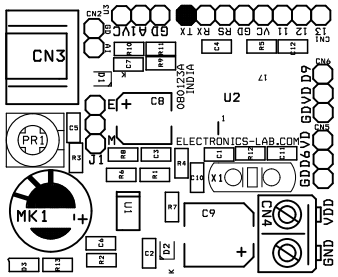
- CN1 Arduino Programming and Boot-Load Connector: Pin 1 = TX, Pin 2 = RX, Pin 3 = Reset, Pin 4 = GND, Pin 5 = VCC 5V DC, Pin 6 = D11, Pin 7 = D12, Pin 8 = D13
- Cn2 Direct Audio Input: Optional, Pin 1 Audio from External Speaker, Pin 2 = GND
- CN3 Stereo EP 3.5MM Female Connector for External Audio 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

PCB

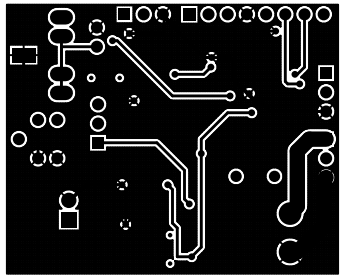




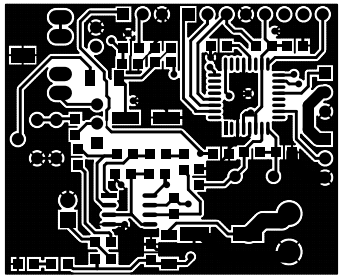
PCB GERBER FILES AVAILABLE



SILK SCREEN TOP



BOTTOM LAYER

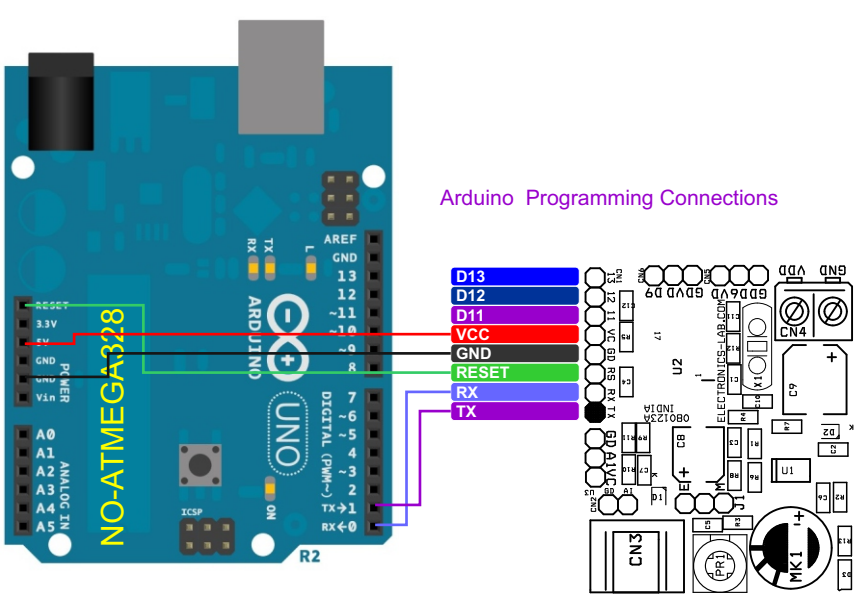


TOP LAYER

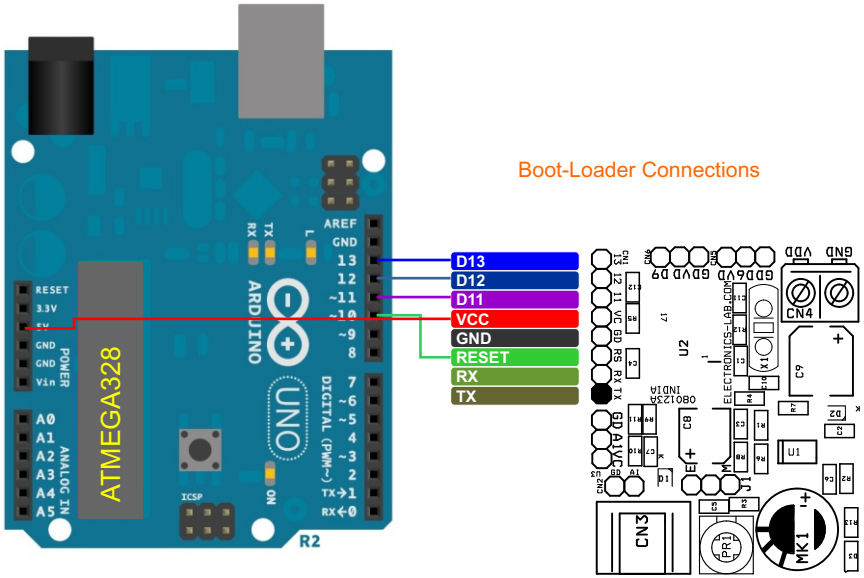
PCB DIMENSIONS 44.45 X 36.20 MM

Parts List

BOM						
NO	QNTY.	REF.	DESC.	MANUFACTURER	SUPPLIER	SUPPLIER PART NO
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



Arduino Programming Connections



Boot-Loader Connections

Notes

APP

Android App

DOWNLOAD

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

SCAN QR CODE

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