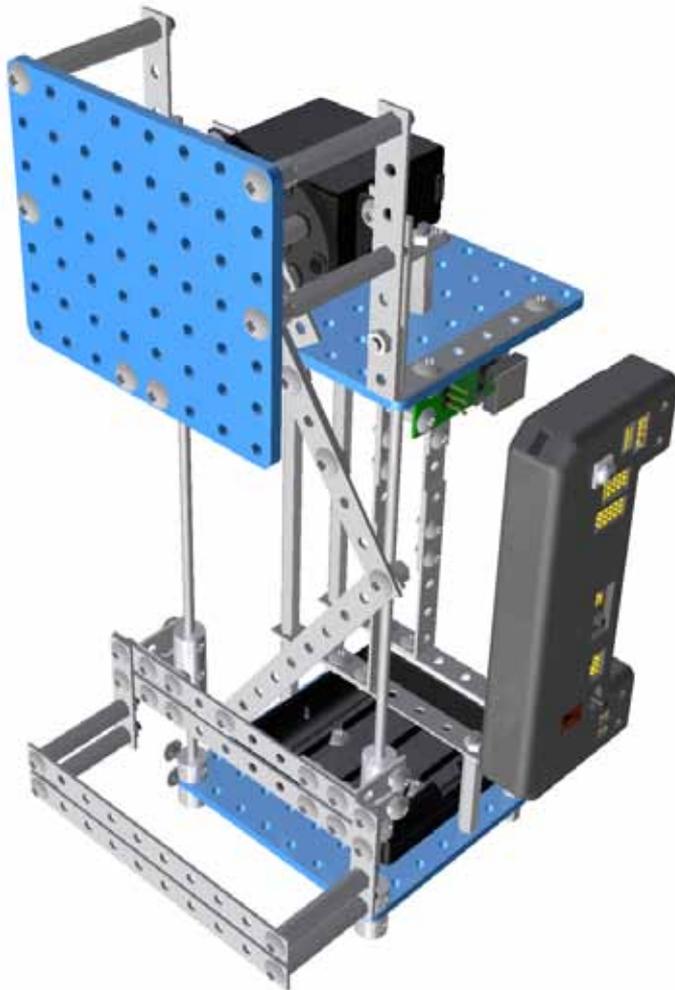


## 9. Melody Robot



# Introduction and working principle

– Measuring the height of a sound wave



Sound is a series of longitudinal or compression waves that moves through air into our ears, and the waves that create vibrations in air are called sound waves.

The height of a sound depends on how fast it vibrates. If a fan is swayed from side to side just one time, it may not create any audible sound worth of attention to human ear. But if a fan is able to be swayed side to side more than 30 times per second, it can create a sound of a certain height. It is same with a guitar string. When a string is picked, it continues waving faster than eye can follow and creates vibrations in air, thus enabling to produce a sound of a constant height.

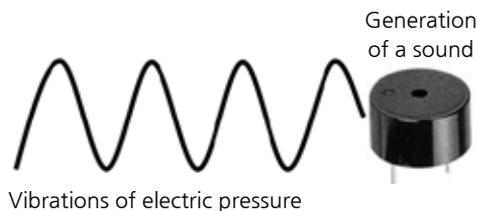


Figure 1. Generation of a sound

In the controller of melody robot, piezo buzzer is embedded, an electronic device commonly used to produce sound by changing electric pressure into vibrations. When the piezo electric material is subjected to an alternating electric field, it stretches or compressed, in accordance with the frequency of the signal thereby producing sound. Hz is the unit of frequency based on the number of vibrations per second to produce a sound in the piezo buzzer. For example, if piezo buzzer is vibrated with the frequency of 13hz, Do sound in 3 octave scale is produce. If vibrated with the frequency of 349hz, Fa sound in 4 octave is produced. We can see that a sound is generated as the number of frequency increase.



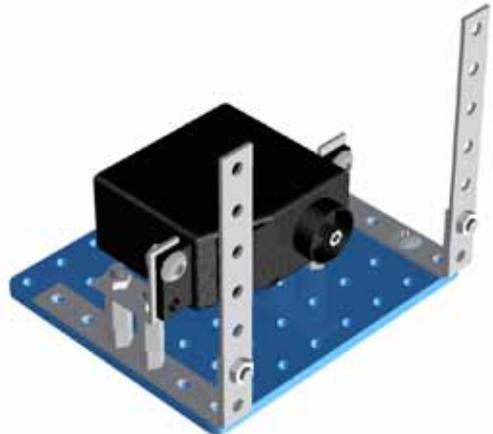
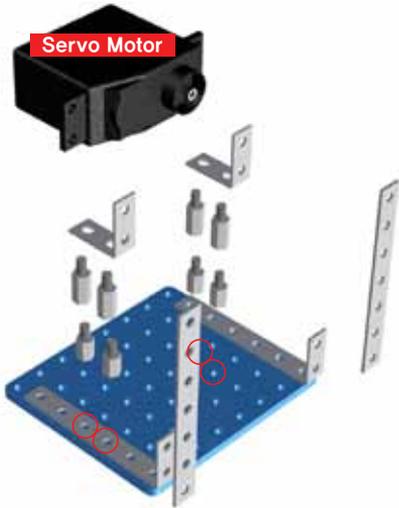
Figure 2. Potentiometer  
Module

The frequency in the melody robot is adjusted by the potentiometer module. A potentiometer is a three-terminal resistor with a sliding or rotating contact that forms an adjustable voltage divider. The height of a sound varies with turn of a rotating contact to the left or right. It is because as the resistance value changes so does the frequency that vibrates buzzer.

1



2

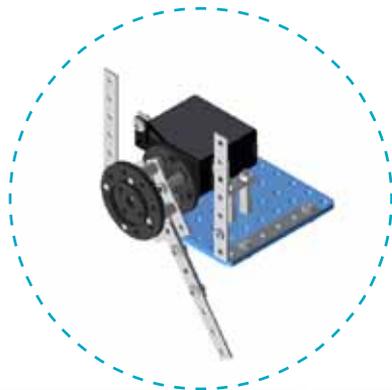
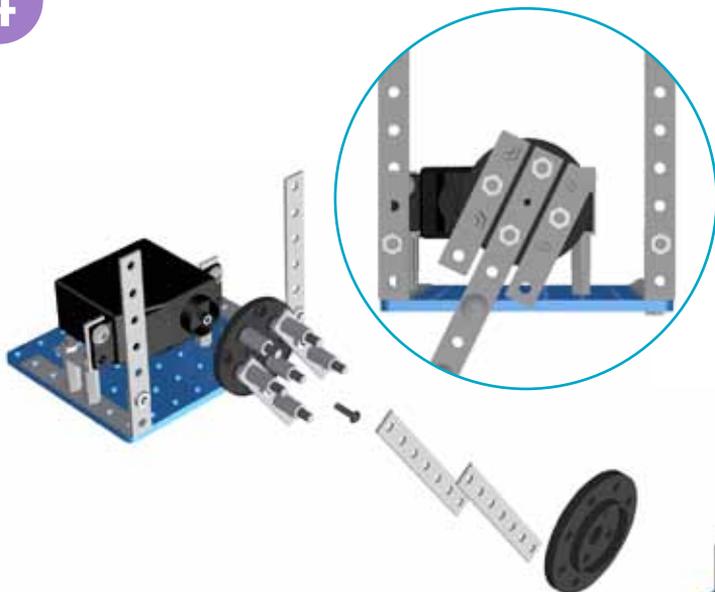


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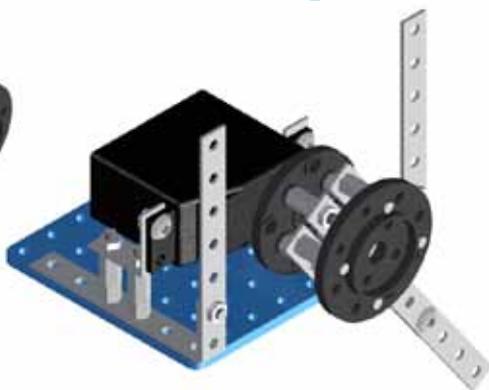


10mm X 8

4



X 1



5



7mm

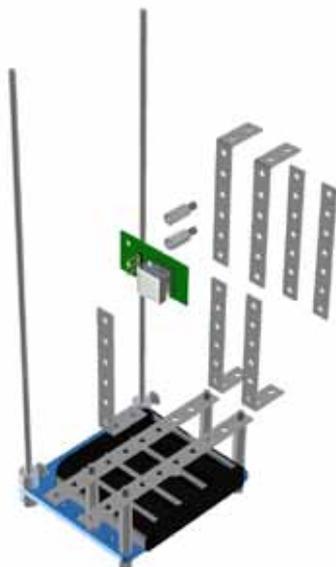
X 4

30mm

X 4



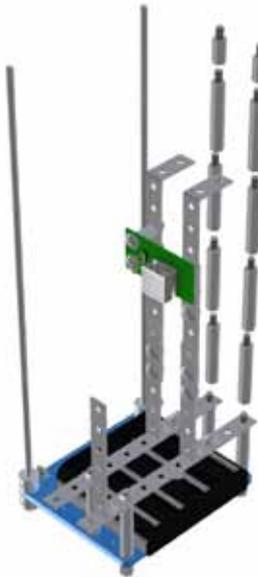
6



10mm X 2



7

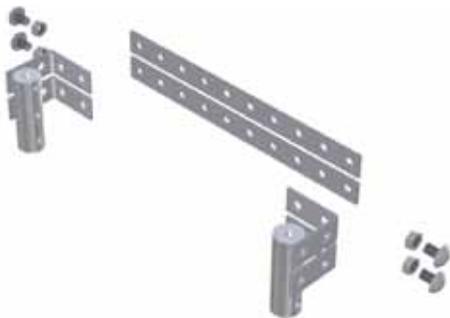


X 2

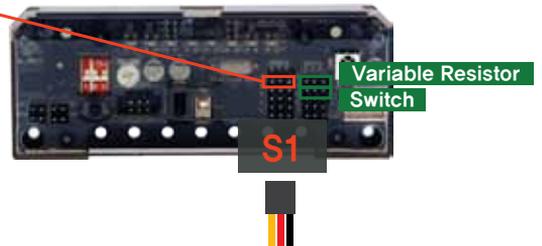
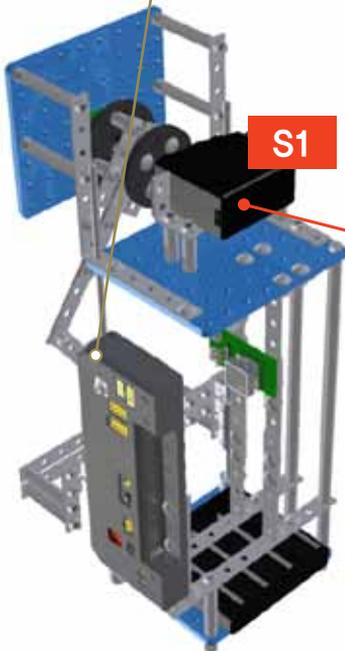
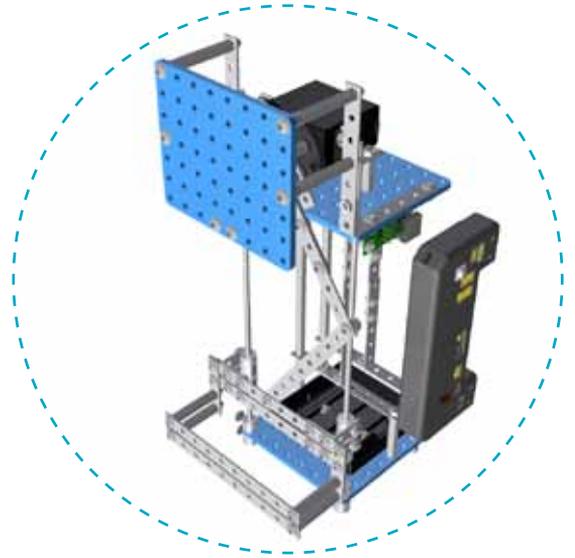
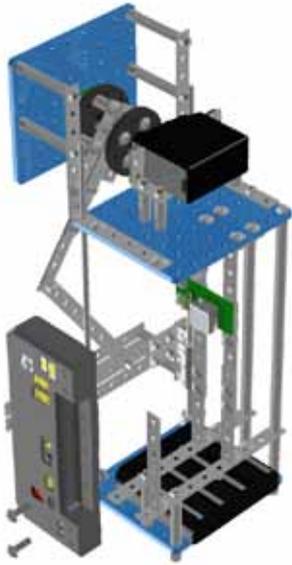


X 8

8







Scan the QR code with your Smart phone, and watch How the robot is driven. →

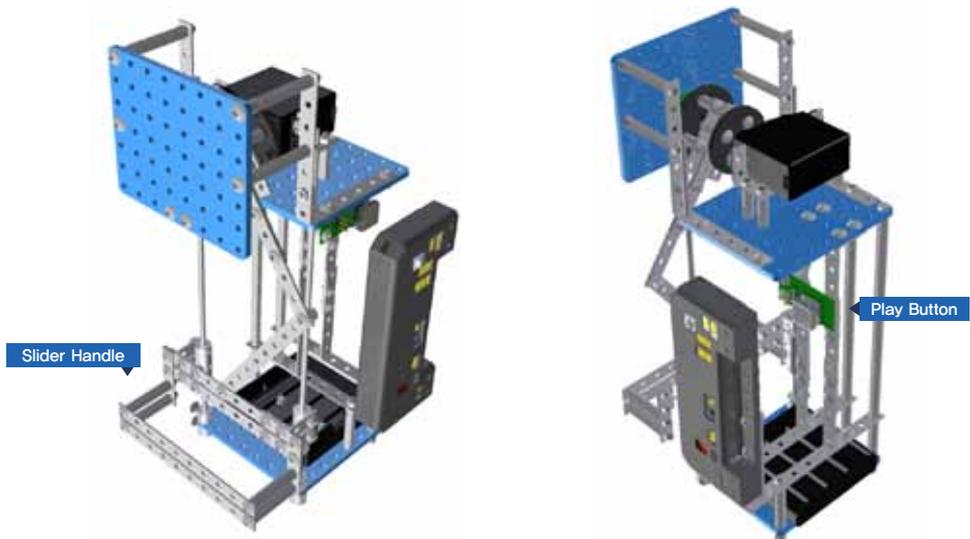


# Acting Module



For driving Melody Robot, select and press program mode 9.

Melody Robot is an instrument player robot that is able to play music. Hold the slider handle and move it up and down. While moving it up and down, push the buttons at the same time to play music. It sounds off melodies depending on the moving locations of the slider handle.



## Tuning Mode

When the melody robot seems to have troubles; and when the performed melodies are off-beat or sound strange, you can trouble-shoot it on Tuning Mode.

Before running melody robot program, move the slider handle down to the bottom. Run melody robot program. Continue pressing the button for over 4 seconds until a beep is sounded off. As soon as a beep has been sounded off, move the slider handle to the top slowly. Get your hands off and then you can play music as usual.

# Play the Game!



Let's play a few simple children's songs.

## 1. Jack Rabbit

### Jack Rabbit

Moderato

Jack Rabbit Jack Rabbit Where are you going now?

Jumping Jumping everywhere Where are you going now?

## 2. Like an apple is my face

### Like an apple is my face

Like an apple is my face How I look so beautiful!

Eyes are shiny! Nose is shiny! And my lips are shiny!