

# REX

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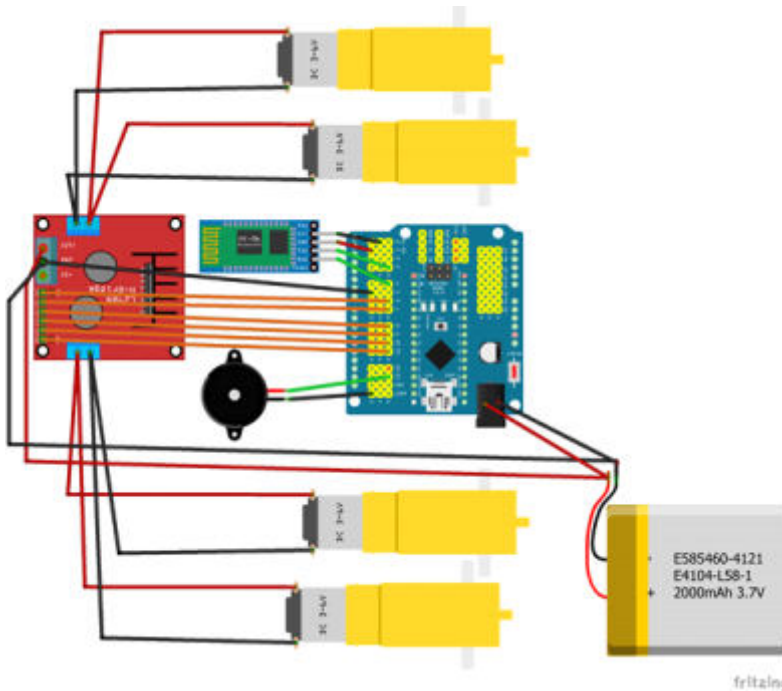
**REX EVOLUTION SERIES  
SUPER STAR TRANSFORMERS  
8 IN 1**

**Voice  
Controlled  
Survivor  
Robot**

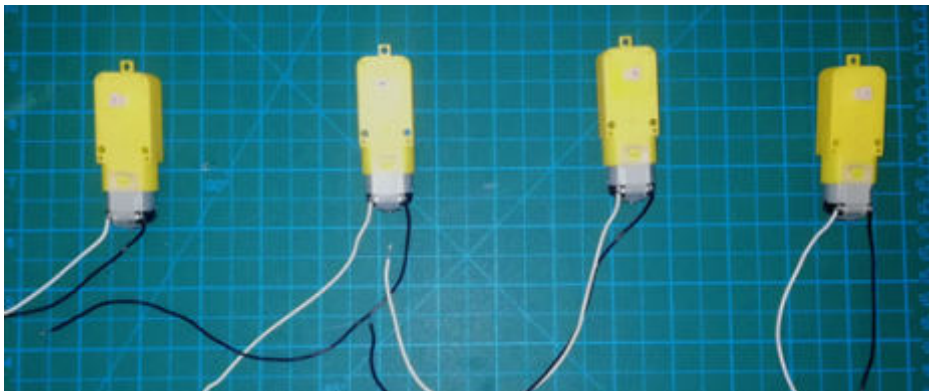
**Author: Mustafa Kemal AVCI**

**V-Tracker**

After completing the installation of our Survivor robot and the assembly of its electronic components, we must make the cable connections according to the circuit diagram below.



Connect Right Motor (+) poles to Out 1 (-) poles to Out 2, left motor (+) poles to Out 3 and (-) poles to Out 4. We will control the out1, out2, out3 and out4 outputs on the motor driver (L298N) with IN1, IN2, IN3 and IN4 pins, respectively. For right motor direction control, connect IN1 and IN2 pins to digital pins D7 and D8 on the sensor shield, respectively. Connect IN3 and IN4 pins to D9 and D10 digital pins for left motor direction control. Connect ENA pin to D6 pin for right motor speed control and ENB pin to D11 pin for left motor speed control.



## Ses Kontrollü Survivor Robot

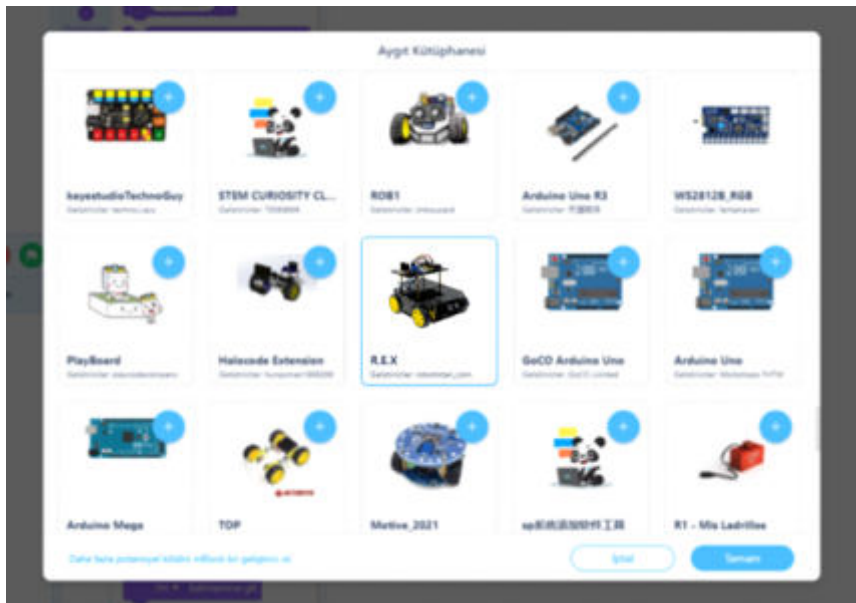
You should solder the motors with 25-30 cm cable as in the photo. We will use the white leads (+) and the black leads (-) as poles. In this case, when we connect the (+) black cable (-) pole to the white wires of the motors, the wheels rotate clockwise.

Connect the long leg of the buzzer that we will use for the horn (horn) to the D13 pin and the other leg to any GND pin designated as G on the sensor shield.

Our HC06 bluetooth module will communicate with the “BT Voice Control For Arduino” mobile application. Let's connect the RX pin of the Bluetooth module to the D4 pin and the TX pin to the D3 pin. Let's connect the VCC pin to the 5V output on the shield and the GND pin to any G pin on the shield.

### Coding

Let's start the mBlock 5 software and add R.E.X from the device library and move on to the coding stage.



Our algorithm will be as follows;

1. Start
2. Identify engines
3. Define Bluetooth
4. Read message if bluetooth connect
5. React by message
6. Stop



Drag and drop the "When REX Starts" block from the event blocks to your code.

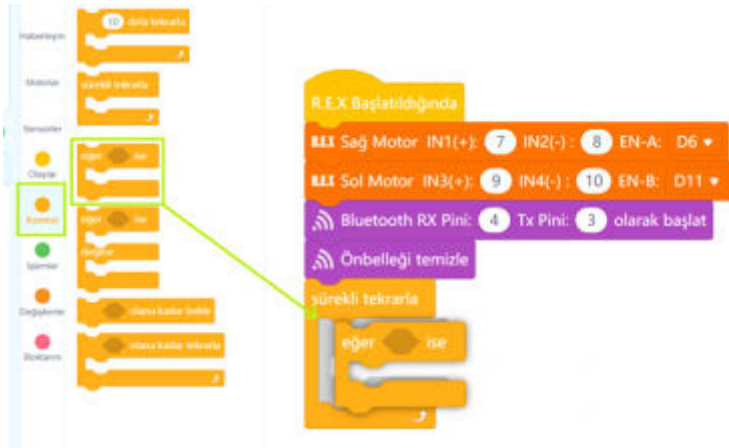
Drag and drop the blocks that we have defined the Right and Left Motor control pins in the "Motors" category, to the "When REX Starts" block, respectively, as in the image. Write the pin definitions in the circuit diagram to the necessary places as in the image.



We find the Bluetooth identification block in the "Communication" category as in the image and place it under the engine identification blocks. Then we change the pin numbers to be the same as the numbers on the circuit diagram, as in the image. With the "clear cache" block, we remove possible cache problems in our connection.



When our robot constantly receives data from the bluetooth connection, it should read and respond to it. For this, let's drag and drop the "If" block from the "Control" category into the "Repeat continuously" block.



Let's place the "Bluetooth connection available" status block in the "Communication" category in the condition field of the "If" block. The full meaning of our conditional expression will be if there is a bluetooth connection.



When the connection is established, we must first ensure that the incoming message is read. For this, let's make STRING by clicking the CHARACTER field in the "Read CHARACTER data pin from IT" block in the "Communication" category. String means a string of characters.

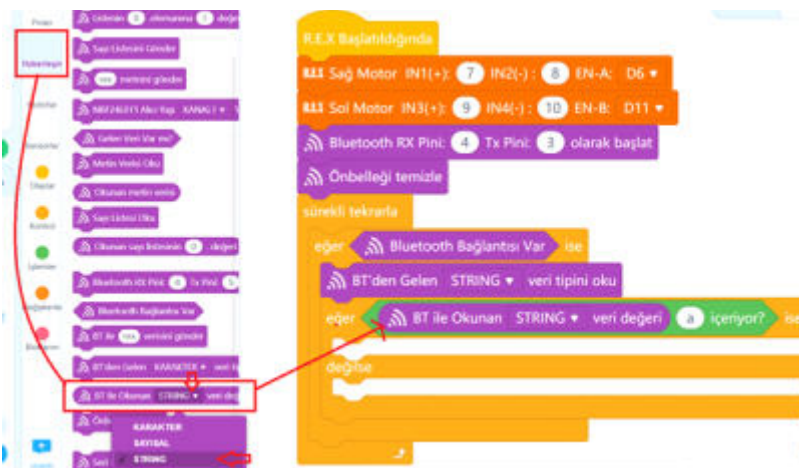




If not, we need to make a Mental comparison to the condition field of the block. For this, as in the image below, the "Apple contains a?" Let's drag and drop the status block. This block gives us a true or false value. With this block, we can understand whether the character or strings we want are in the value read.



We will place the STRING data we read from BT in the section of the green colored male comparison operator block that says "apple". Because the data to be compared is O. As in the image below, we take the "STRING data value read by BT" block from the "Communication" category and insert it into the place where apple is written.



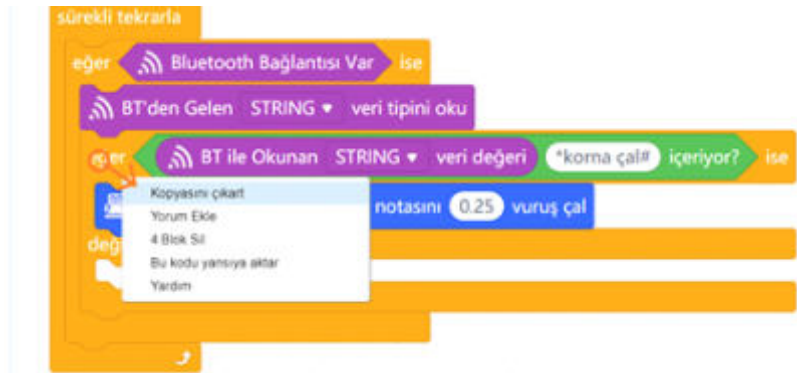


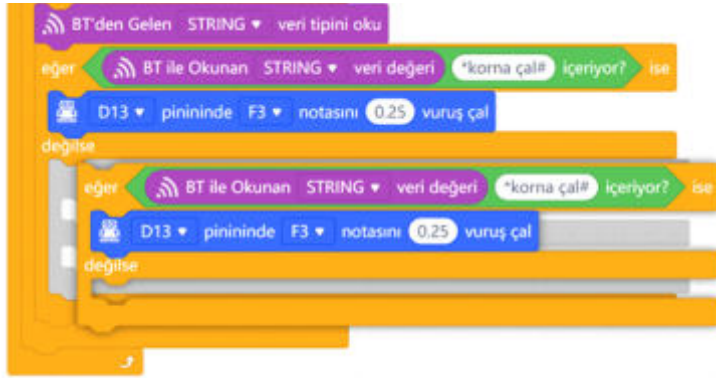
BT Voice Control For Arduino app recognizes your speech using Google Voice recognition service. It takes the defined words and sends it via bluetooth by adding the "\*" character to the beginning and the "#" character to the end. For example, if you click on the microphone icon in the mobile application and say hello, it comes to our robot as \*hello#.

First of all, let's prepare a command that will play a note from the buzzer when it is said "strum the horn" in the sense of playing the horn. For this, we need to write \*strum# in the field inside the green block. Then, if the condition is true, let's make our robot respond to make a sound with the block to play the F3 note 0.25 beats on the D13 pin from the "Pins" category.



We should place the "if not" block, which we will use for each of the menial comparison expressions that we will add from now on, in the "if not" field of the previous one. Right-click on the "if not" block and give the "copy" command. If not, we insert a copy of the blocks that will be formed at that moment.





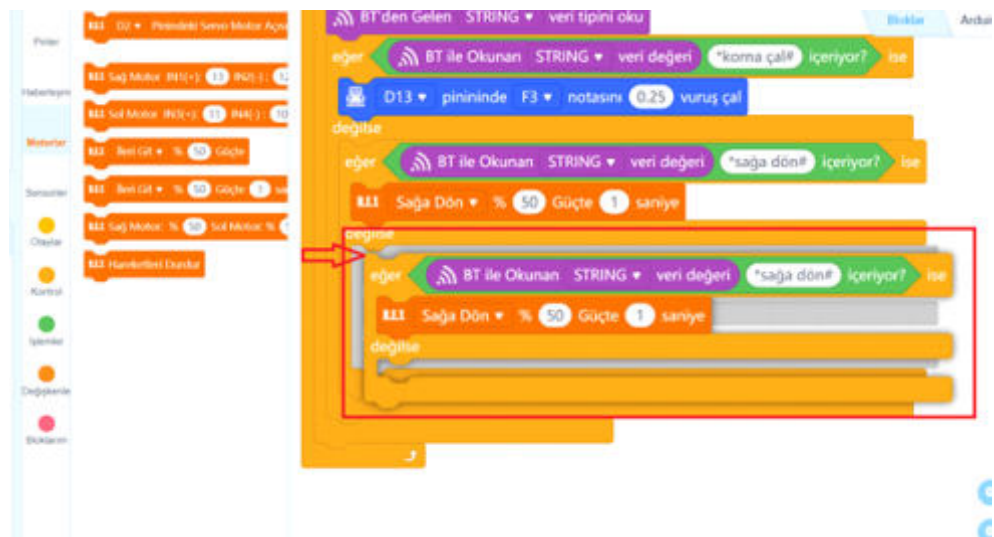
We make \*turn right# by changing the menial comparison expression in the blocks we have copied. If the condition is true, we delete the blue-colored Note playing block in the code area that will work by right-clicking on it. We replace it with the "Turn right, 1 second at 50% power" block from the "Engines" category.



Let our next condition be \*turn left#. For this, we right-click on the "If not" block that we placed last and give a copy command.



If not, we place the copied blocks in the field.

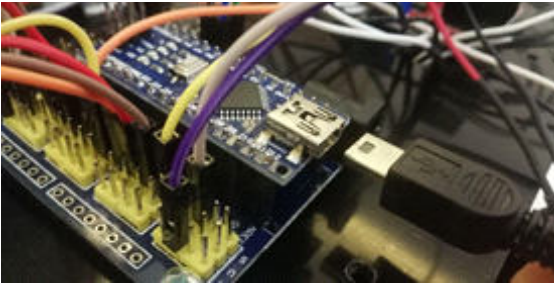


We replace the last inserted \*turn right# with \*turn left#. We're also changing the phrase "turn right" in the engine block to "turn left".



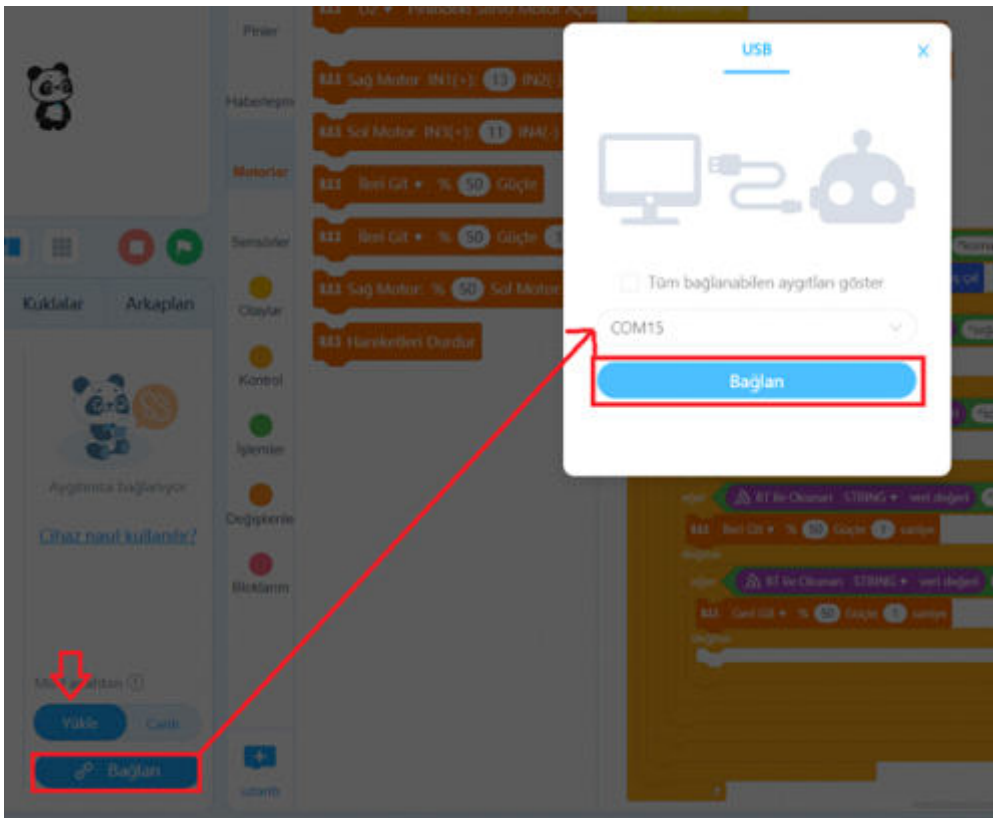
Let's copy it this way and change the condition expression and motor direction to create \*go forward# and \*backward# conditions as follows and learn how to code.



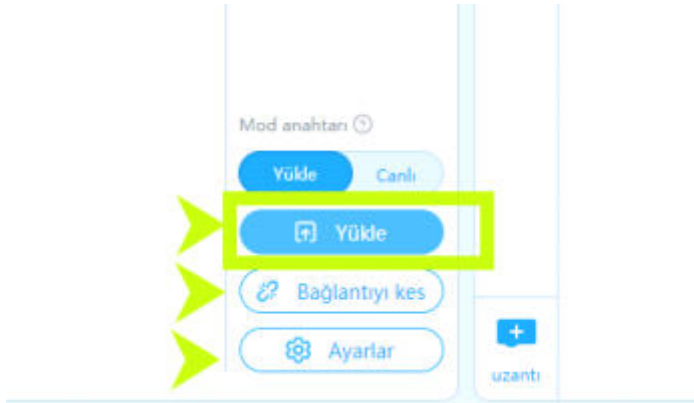


We can now upload the codes we have prepared to our robot. We connect one end of the USB cable to Arduino nano and the other end to our computer.

Click on the now connect button in the installation mode and tick the option to show all connectable devices. The mBlock software will automatically insert the COM port number to which our CH340 chip card is connected. If connection is not possible, you can select other COM port numbers from the drop-down list.

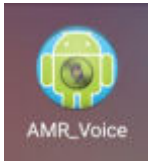


When the connection is established, the "disconnect", "settings" and "Install" buttons will be active. Let's upload the code to our robot by clicking the upload button.

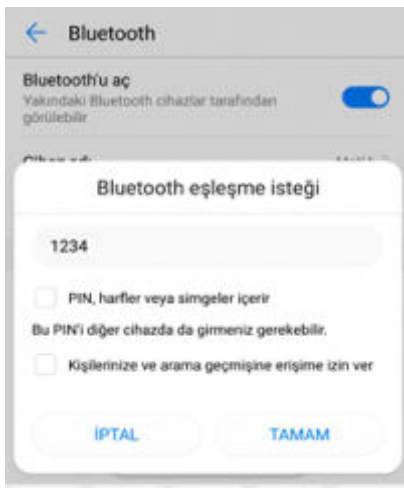


### Execution of Codes

To control our robot, we download the "BT Voice Control For Arduino" application from our application store.



We start our application, which is downloaded and installed on our device.



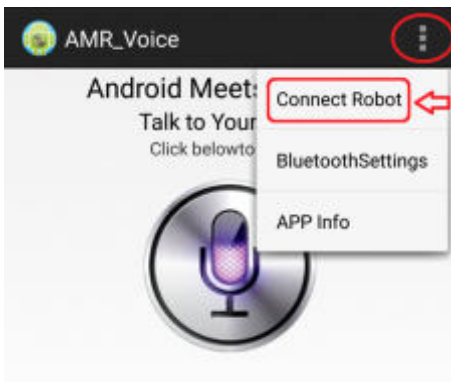
We search for a device by entering the bluetooth settings of our mobile device. Let's wait for him to see our robot as HC-06. After seeing our device HC-06, when we click on it, we enter 1234 as the password and complete the pairing process.



We can open our application now. If our phone's Bluetooth connection is not active, the application will automatically open your Bluetooth connection when opening. When the application is opened, you should see the screenshot below.

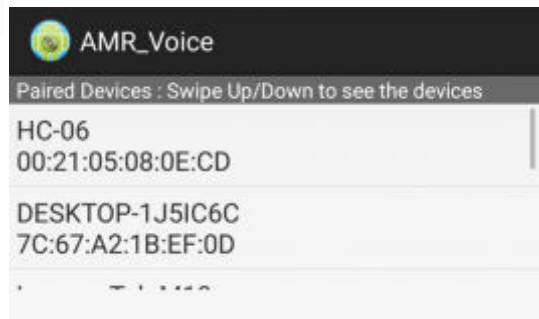


Now we will connect our robot to our application. We have to make the power connections of our robot. After making the power connections to the jag input of the sensor shield and the motor driver, the red LED on the HC06 module will start to flash. A flashing response means that the bluetooth device is not connected. In order to connect, we click on the 3 dots icon in the upper right corner and give the "Connect Robot" command.



A list of bluetooth devices paired with our device will appear. Scroll through the list and find the HC-06 and click on it.

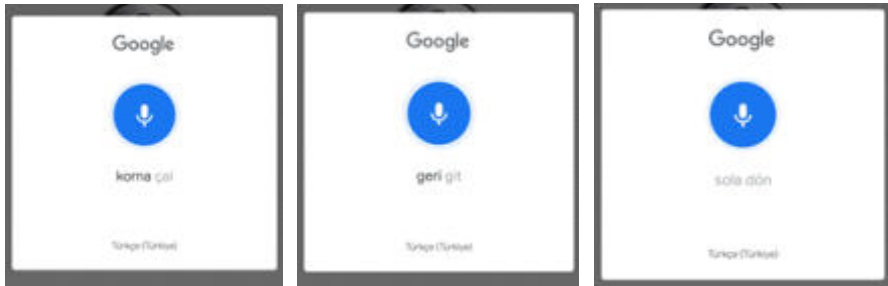
When you click on it, the notification "Connected to HC-06" will appear at the bottom of the screen for 1-2 seconds.





Connected to HC-06

After receiving the notification that our application has been connected to our robot, the LED of the HC06 module on our robot should turn solid red. We can now give voice commands from our app. We click on the microphone icon and say the words we determined during coding.



When the voice command is detected and converted to text, we will hear a short beep from our device. 1-2 seconds after this sound, it is sent to our robot with our speech and it gives a response as soon as it receives food with the robot.

You can code your robot to react differently to different words.



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FORUM



[forum.robotistan.com](https://forum.robotistan.com)

BLOG



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