ByteRider

Version

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ByteRider documentation

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INTRODUCTION

HOW DOES IT WORK?

The BitByteRider RC car is powered by ESP32-C3 Breadboard & Power adapter developmemt board.

Reserved Pins & GPIOs

The following table summarizes GPIOs and pins reserved for operations purposes.

The GPIO numbers correspond to those on the ESP32-C3 WROOM microcontroller. The Pin number corresponds to the pin on the Breadboard and Power adapter development board.

x- and y- axis

The GPIO0 and GPIO1 assigned to measuring the voltage of x- and y- axis of the Joystick. Lastly, there is a group of GPIO pairs responsible for PWM for DC motors.

Direction and Speed

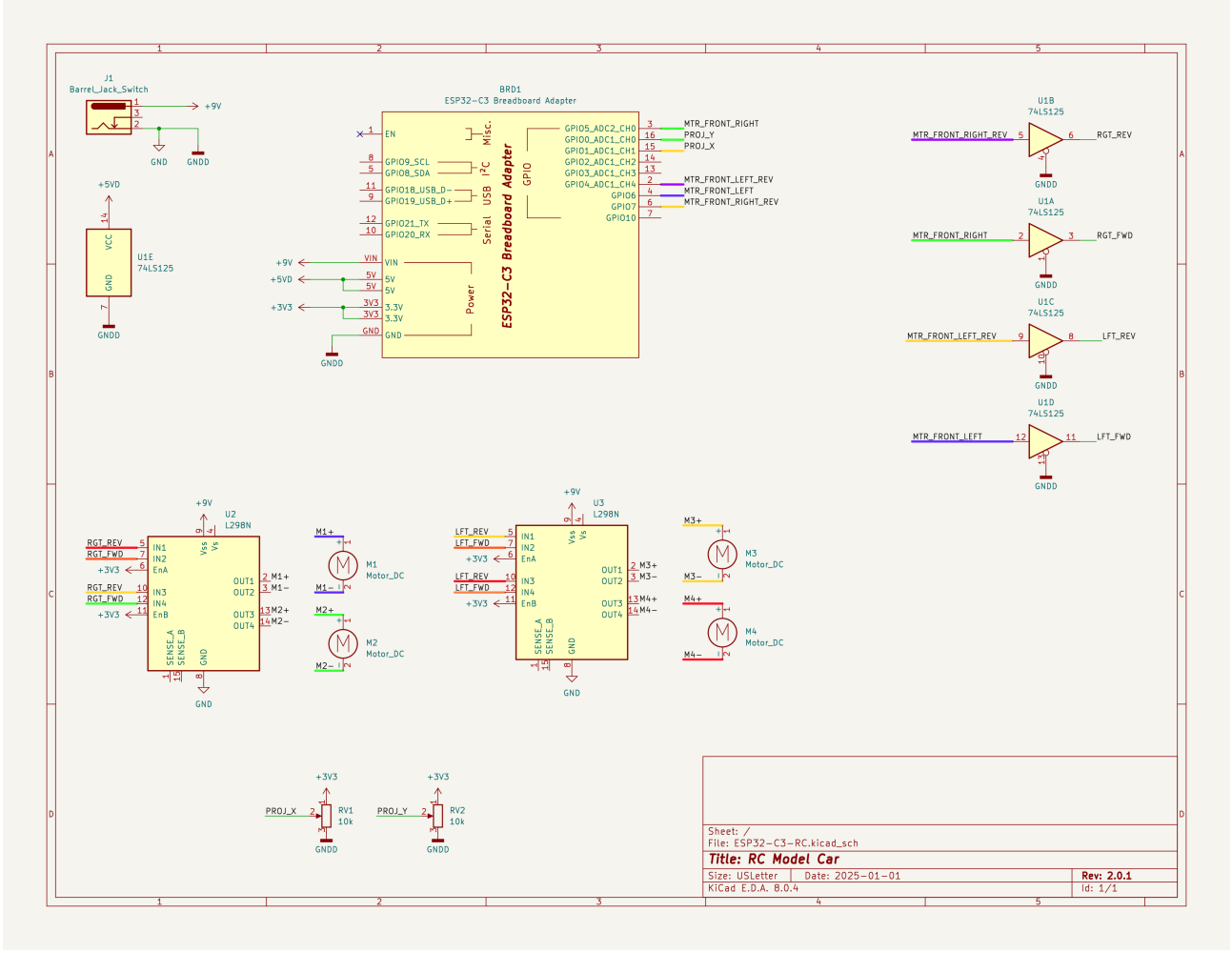
The two DC motors on the left side are wired to the dedicated PWM channels in pairs. This means that PWM channels can control rotation speed and direction of DC motors in pairs (i.e. left and right side). Consequently, only four PWM channels are required for controlling the direction of the RC car. Based on this constraint, the RC car can only move front, back, and rotate left and right. Any other movements are not possible (i.e. diagonal).

A pair of PWM channels are required for defining rotation speed and direction of the DC motors on each side. In particular, __GPIO6__ and GPIO5 provide PWM to the left- and right- side DC motors to rotate in a clockwise direction. Similarly, GPIO4 and GPIO7 provide PWM to the left- and right- side DC motors to rotate in a counter-clockwise direction. Changing PWM on each channel determines the speed and direction of the RC car.

GPIO	Pin	Function	Notes
0	16	Joystick x-axis	ADC1_CH0

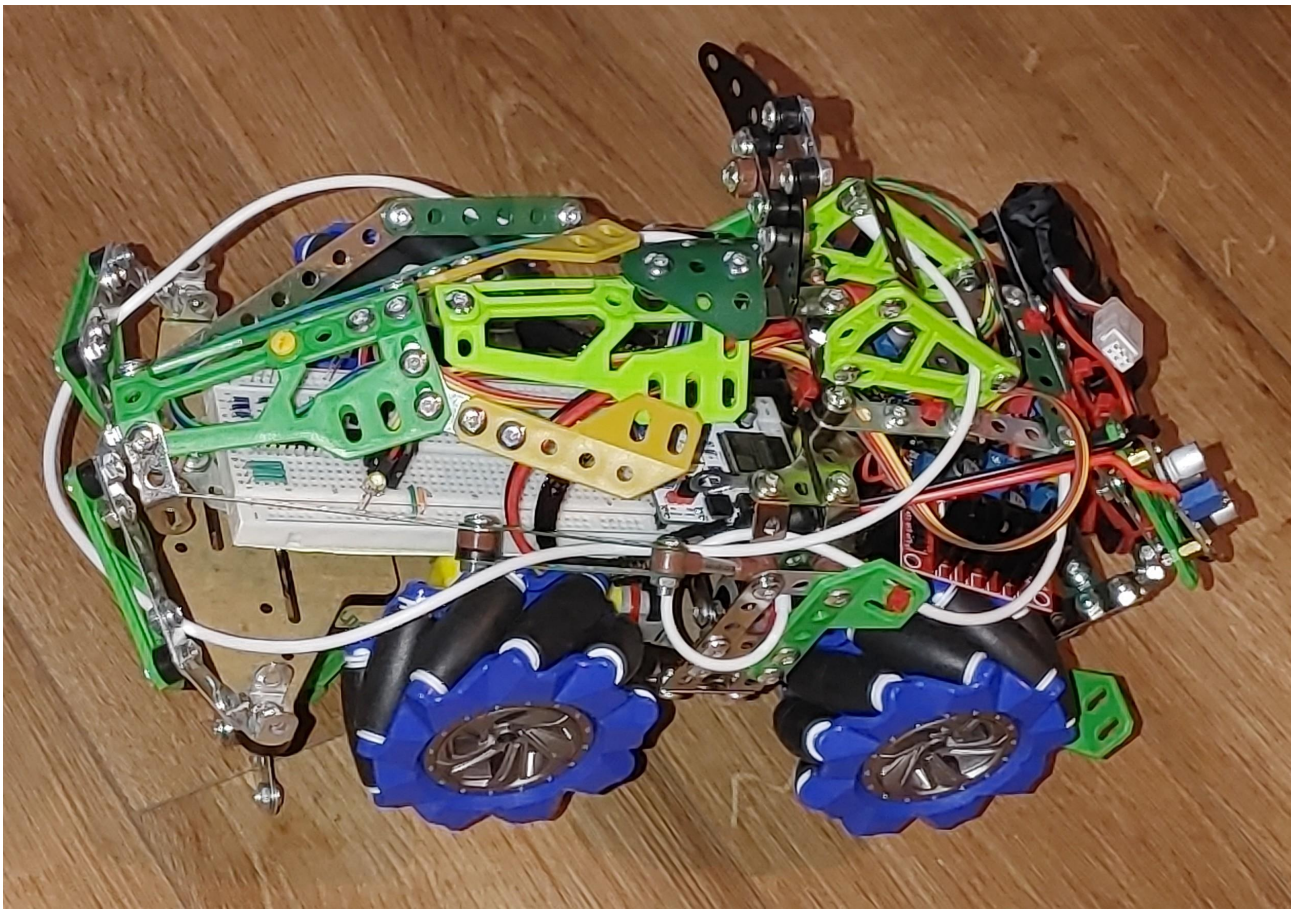
GPIO	Pin	Function	Notes
1	15	Joystick y-axis	ADC1_CH1
8	5	Joystick push button	
6	4	PWM for clockwise rotation of left-side motors	LEDC_CHANNEL_1
5	3	PWM for clockwise rotation of right-side motors	LEDC_CHANNEL_0
4	2	PWM for counter-clockwise rotation of right-side motors	LEDC_CHANNEL_2
7	6	PWM for counter-clockwise rotation of left-side motors	LEDC_CHANNEL_3

Schematic

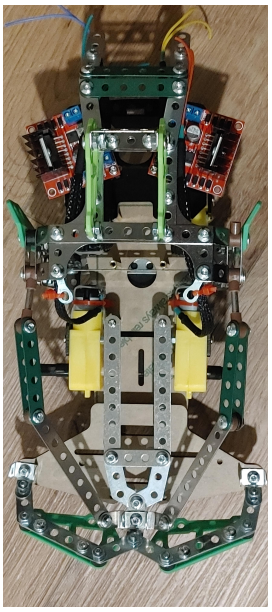

J1
Barrel_Jack_Switch
+9V
GND
GNDD
BRD1
ESP32-C3 Breadboard Adapter
ESP32-C3 Breadboard Adapter
EN
GPIO9_SCL
GPIO8_SDA
GPIO18_USB_D-
GPIO19_USB_D+
GPIO21_TX
GPIO20_RX
VIN
5V
3V3
GND
Misc.
I2C
Serial USB
Power
GPIO
GPIO5_ADC2_CH0
GPIO0_ADC1_CH0
GPIO1_ADC1_CH1
GPIO2_ADC1_CH2
GPIO3_ADC1_CH3
GPIO4_ADC1_CH4
GPIO6
GPIO7
GPIO10
MTR_FRONT_RIGHT
PROJ_Y
PROJ_X
MTR_FRONT_LEFT_REV
MTR_FRONT_LEFT
MTR_FRONT_RIGHT_REV
+5VD
U1E
74LS125
U1B
74LS125
MTR_FRONT_RIGHT_REV
RGT_REV
U1A
74LS125
MTR_FRONT_RIGHT
RGT_FWD
U1C
74LS125
MTR_FRONT_LEFT_REV
LFT_REV
U1D
74LS125
MTR_FRONT_LEFT
LFT_FWD
U2
L298N
RGT_REV
RGT_FWD
+3V3
M1
Motor_DC
M2
Motor_DC
U3
L298N
LFT_REV
LFT_FWD
M3
Motor_DC
M4
Motor_DC
PROJ_X
PROJ_Y
RV1
10k
RV2
10k
Sheet: /
File: ESP32-C3-RC.kicad_sch
Title: RC Model Car
Size: USLetter
Date: 2025-01-01
Rev: 2.0.1
KiCad E.D.A. 8.0.4
Id: 1/1

WORK-IN-PROGRESS WALK THROUGH

Finished Work

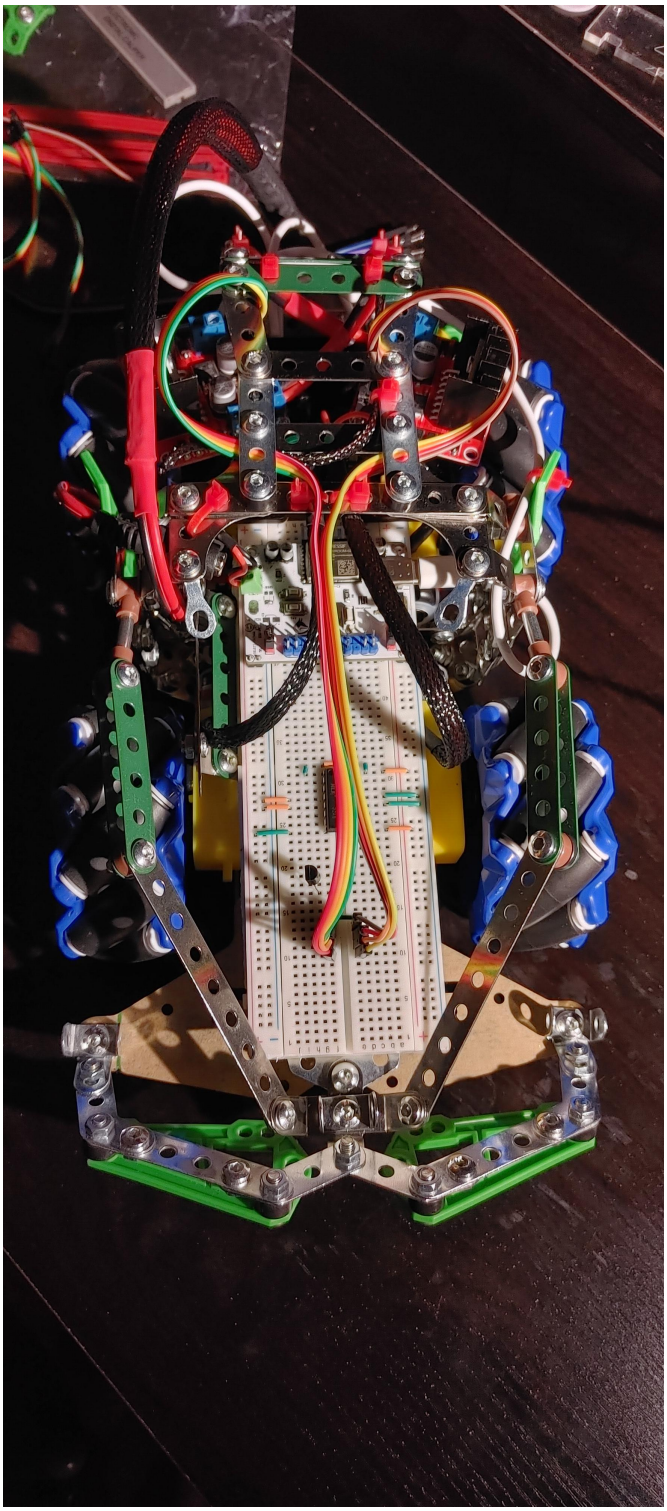


Chassis



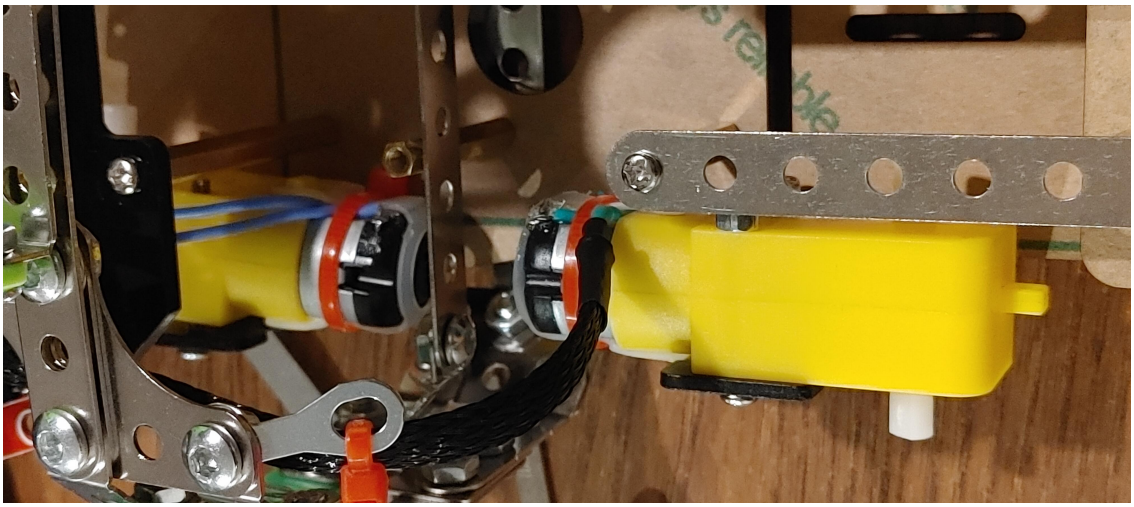
Completed chassis with only DC motor controllers installed.

Wiring



Completed wiring.

Motor Wires Harness



DC Motors wires secured inside harnes.