PROTOTIPO DE CARRO CONTROLADO MEDIANTE BLUETOOTH

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ABSTRACT

In that document it is presented in a simple and practical way how to create a prototype of a RC car.

for this, a PIC 16F15244 was used as a base, which was programmed in C LANGUAGE and oversees receiving the signal from a BLUETOOTH module and controlling the rest of the device. In the following **GitHub repository**, you can find the algorithm in C language and more information about the project.

https://github.com/JFelipeReyes/Prototype-of-a-car-controlled-by-Bluetooth

INTRODUCTION

The microcontroller is a programmable integrated circuit that contains different resources. Used to control the operation of assigned tasks by programming, its pins support the connection of the actuators or modules of the device to be controlled, these can be both input and output. [1] These devices have been used in the electronics industry for a long time because it helps reduce circuit size [2]

In this case a prototype Bluetooth-controlled carriage can be observed. this is intended to show how you can use a cell phone into a remote control.
This will be controlled by an MCU (PIC16F15244 Curiosity Nano).

OBJECTIVES

General

Develop a Bluetooth-controlled device remotely using a smartphone.

Specific

- Develop a code to control the PIC16f15244 through a Bluetooth module.
- To assemble the trolley to be controlled.
- Develop an Android application that works as a control of the device.

METHODOLOGY

Sketch what will be the assembly of the device and develop the software, make the purchase of the necessary components for the construction of the device, inform us about the development of the mobile application through which the device will be controlled, assemble the components purchased to have as a result the assembly of the device, the support of the MPLAB X IDE software and the XC8 compiler is needed to implement the code which will govern the behavior of the device. The materials required for the elaboration of this project are: PIC 16F15244 CURIOSITY NANO, Bluetooth module HC-05, L298N module, four motors, four wheels, four tires, acrylic chassis, two-cell lipo battery and its charger.

Table 1. Materials

COMPONENTES	CANTIDAD	PRECIO
PIC 16F15244	1	$ 78.000,00
HC-05	1	$ 21.000,00
L298N	1	$ 12.700,00
CHASIS	1	$ 50.000,00
LM7805	1	$ 1.000,00
2N2222	15	$ 4.500,00
RESISTENCIAS	21	$ 2.100,00
LEDS	6	$ 1.000,00
BATERIA LIPO	1	$ 25.000,00
CARGADOR	1	$ 40.000,00
APP CONTROL	1	NA
VIÁTICOS	NA	$ 100.000,00
TOTAL COSTOS		$ 335.300,00

Table 2. MCU Connections

MICROPROCESSOR CONNECTIONS	
PIN	**CONNECTION**
RA1 (PWM)	EN1, EN2
RB4	IN1 (L298N)
RB6	IN2 (L298N)
RB7	W. L. RIGHT
RC0 (TX)	RX (BT)
RC1 (RX)	TX (BT)
RC4	IN4 (L298N)
RC5	IN3 (L298N)
RC6	W. L. LEFT
RC7	W. L. STOP

BT: BLUETOOTH MODULE
W. L.: WARNING LIGHTS

RESULTS

The prototype was assembled, but there were drawbacks when it came to controlling the car via Bluetooth, so we chose to make a reading communication on the cell phone instead of controlling through it.

it was not fully met with the proposed objectives, but we found an alternative to demonstrate that the cell phone can be linked to the pic16f15244 and demonstrate a relationship with operation.

Figure 1. Car

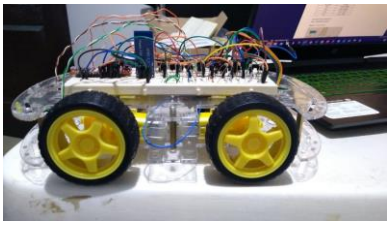

Figure 2. Car

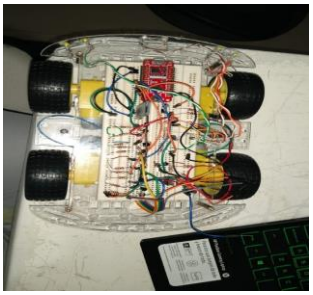

Figure 3. Final circuit

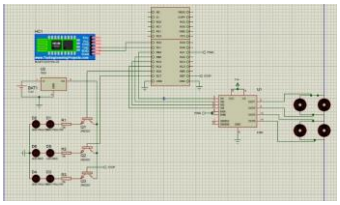

Figure 4. distribution

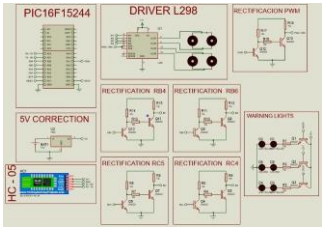

Figure 5. PIC Schematic

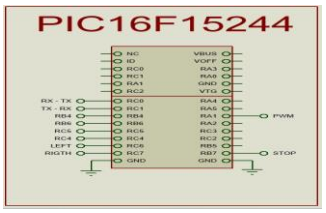

Figure 6. L298N Schematic

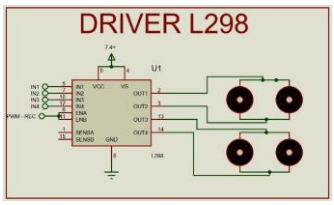

Figure 7. Regulation

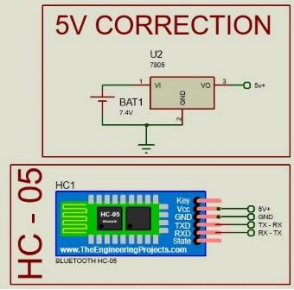

Figure 8. Transistor converter

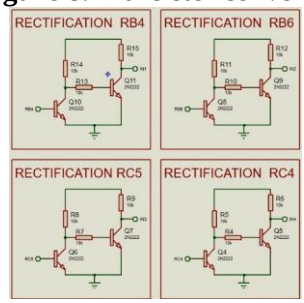

Figure 9. Warning lights

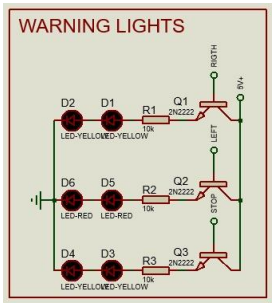

Figure 10. App image

CONCLUSIONS

In conclusion, microcontrollers have multiple applications. These devices are very versatile and help a lot to reduce costs in complex circuits, because they have many functions that can be executed by it.

Also, the use of this pic can be very versatile in the development of simple projects, when trying to do very complex things it is inevitable to run into incompatibilities due to the little that has been used and the lack of libraries.

BIBLIOGRAPHY

[1] J. Angulo Usategui y I. Angulo Martinez, Microcontroladores -PIC- Diseño práctico de aplicaciones, España: McGRAWHILL/INTERAMERICANA DE ESPAÑA, S. A. U, 2003.

[2] E. Palacios, F. Remiro y L. López, Microcontrolador PIC16F84-Desarrollo de proyectos, Mexico: Ra-Ma, 2002. **Figure 3.** LCD operation