

# **Project 5 - The Carousel**

**January, 2020**

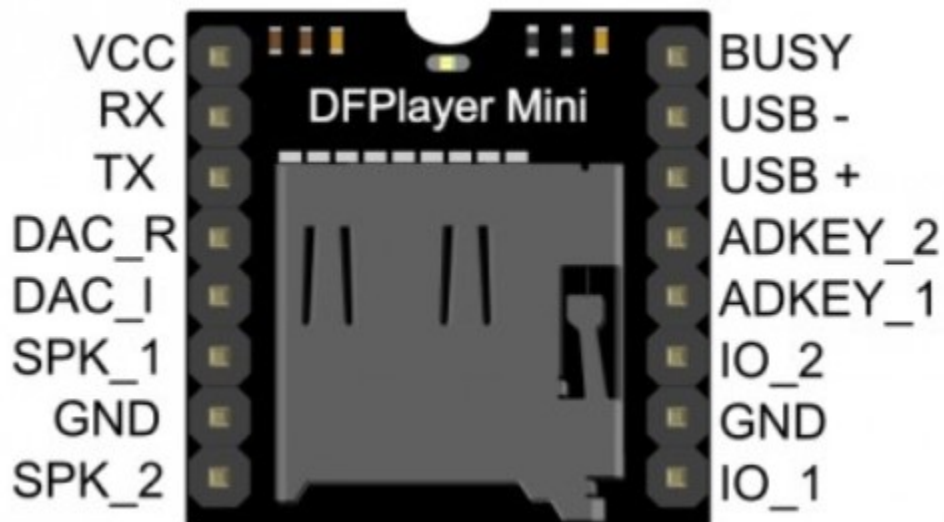
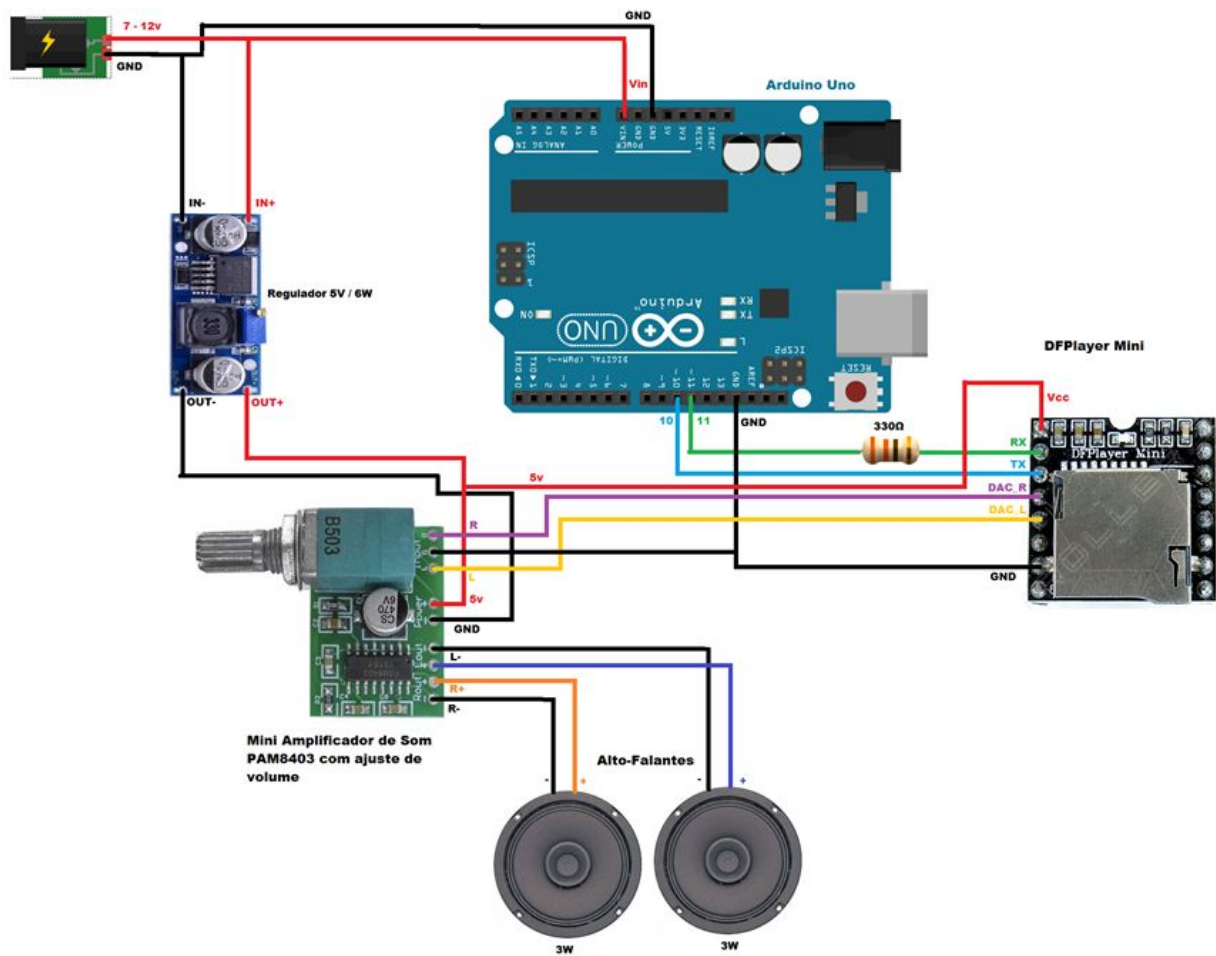
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This project takes an old IHC carnival carousel and adds an Arduino controlled MP3 player and amplifier playing a collection of John Philip Souza marches, and a replaces the IHC provided motor with a more powerful, quiet, RPM controlled Hanksraft motor. The result is a more attractive depiction of a classic carousel.

## **Required Components:**

- Arduino Uno (not a Nano) with USB cable, or Equivalent
- LCD2004 I2C Display (4 rows by 20 characters)
- DFPlayer Mini MP3 Player and 4GB Micro SD Card
- PAM8403 Mini Amplifier
- SPST Toggle Switch
- 5V Relay Board
- LM2596 Buck Converter, aka: "Voltage Regulator" (qty 2)
- 8 Ohm, 3W Speakers (qty 1 or 2)
- 9VDC, 1 Amp Power Supply ("Wall Wart")
- Hanksraft 12VDC 4RPM motor
- Jumper wires, perforated board, 330Ω, 10KΩ resistors,  
1/8" ID plastic tubing solder and tools

Before we begin, I would like to credit Fernando Koyanagi for his work on an "MP3 Player with Arduino" as can be found in [Instructables.com](https://www.instructables.com/id/MP3-Player-With-Arduino/); his work is the foundation of my implementation of animating a model railroad carousel, and I encourage you to review his web page at <https://www.instructables.com/id/MP3-Player-With-Arduino/> before attempting this project. A native of Brazil, he names his Arduino variables in Portugese (I have translated variable names into English before adding my enhancements), but even for me being a native English speaker I found it well worth the effort to understand his excellent work.



## PinOut

Number	Name	Description	Note
1	VCC	Input Voltage	DC3.2-5.0V;Type;DC4.2
2	RX	UART serial input	
3	TX	UART serial output	
4	DAC_R	Audio output right channel	Drive earphone and amplifier
5	DAC_L	Audio output left channel	Drive earphone and amplifier
6	SPK2	Speaker	Drive speaker less than 3W
7	GND	Ground	Power Ground
8	SPK1	Speaker	Drive speaker less than 3W
9	IO1	Trigger port 1	Short pree to play previous(long press to decrease volume)
10	GND	Ground	Power Ground
11	IO2	Trigger port 2	Short pree to play next(long press to increase volume)
12	ADKEY1	AD port 1	Trigger play first segment
13	ADKEY2	AD port 2	Trigger play fifth segment
14	USB+	USB+ DP	USB Port
15	USB-	USB- DM	USB Port
16	Busy	Playing Status	Low means playing\High means no

Scraping the risers from the carousel bottom.

