

The Pulsinator Project



One of the biggest benefits of FIRST Robotics is the inspiration and creativity gained by building robots. FRC Team 2175, has used this inspiration to launch a product aimed at assisting other teams in building and testing their robots, both before and during competition.

In the fall of 2013, mentors from our shop space partners, Team 3130 The Errors, and our own team collaborated to develop an idea for a motor tester. The motor tester uses the pulse width modulation (PWM) signals that the motor controllers require and basically mimics the roboRIO in telling the motors how to move. We recruited students to work on the project and set about brainstorming how we should accomplish the objective of building a PWM motor tester.

For the first round of prototyping, we took a multi-path approach and tried many different designs. One used an Arduino chip to generate the pulsed signal, another used a smaller microcontroller, and yet another used a 555 timer chip to create the timed pulses. As we worked on the prototypes, some advanced to lead the potential set of solutions and others fell by the wayside. By the beginning of the 2014 game Aerial Assist we had a working prototype that used the 555 timer. Thus, the Pulsinator was born.

During the 2014 build season, we demonstrated the viability of our idea by using the prototype Pulsinator to control the motors in our shooter prototypes. The Pulsinator provided a critical advantage over our old way of running motorized prototypes, which involved lugging out a heavy, cumbersome power supply to provide power. Using the Pulsinator, we simply connect the battery to the motor controller and the motor controller to the Pulsinator. This simplifies the entire build season prototyping process and speeds up design iterations, as well. The Pulsinator also serves as a useful debugging tool by allowing us to test specific systems on our robot without us having to connect the robot to a computer and go through the Driver Station.

After the experience of the 2014 build season with the Pulsinator, we began to move into production mode in the fall of 2014. Our electronics captain finalized his circuit design, and we produced our first inventory of Pulsinators. To speed up the production and include new students, we taught anyone who was interested how to solder. We then let them participate in producing the Pulsinators. After we had a stock to sell, we set up a website for our product and commenced marketing, developing small-business skills along the way.

Now, with the Pulsinators ready to ship, we plan to open our online store to the public shortly!