

Construction of a Desktop Arduino Controlled Propeller Test Stand

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Abstract : Aerospace engineering and aeronautical engineering students studying propulsion often learn about propellers and their importance in aviation propulsion. In order to reinforce concepts introduced in the classroom, laboratory projects are used. However, to test a full scale propeller, an engine mounted on a test stand must be used. This engine needs to be enclosed in a test cell for appropriated safety requirements, is expensive to operate, and requires a significant amount of time to change propellers. In order to decrease costs and time requirements, the authors designed and built an electric motor powered desktop Arduino controlled test stand. This test stand is used to enhance student understanding of propeller size and pitch on thrust. The test stand can accommodate propellers up to 25 centimeters in diameter. The code computer allowed for the motor speed to be increased or decreased by 1% per second. Outputs that are measured are thrust, motor rpm, amperes, voltage, and motor temperature. These data are exported as a .CVS file and can be imported into a graphing program for data analysis.

Keywords : Arduino, Laboratory Project, Test stand, Propeller

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