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## DESIGN, MANUFACTURING AND FLIGHT TEST OF CUSTOM MODEL ROCKET

**Abstract**

The purpose of this project is to test author's general knowledge in the field of aerospace engineering and his practical abilities in the field of computer aided design & manufacturing by devising and building a fully functional model rocket capable of flying approximately 700 meters high, landing safely back on the ground, capturing images and measuring various flight data with its onboard computer in the process. Every component of the rocket is completely own design, including the experimental solid fuel motor (running on potassium nitrate and sorbitol mixture) with total impulse of approximately 150Ns and chute deployment system based on mechanical release via precompressed springs, triggered by onboard computer when certain flight conditions are met, rather than utilizing commonly used delayed pyrotechnic charges. Flight stabilisation via automatic fin control (using PID regulators) is considered in the development, but currently not expected to be implemented considering the time constraints. Various manufacturing processes such as turning, milling, 3D printing, welding, soldering, etc. are used to make the practical part of the project very diverse and to encourage younger engineering students to work on similar seemingly difficult and complex projects.

The rocket is scheduled to be finished by the end of April/beginning of May, with public flight test expected to happen at the end of May within the airspace of Tocna airport in Prague.

This project serves as author's Bachelor thesis at the Czech Technical University in Prague as well and meets all local laws and restrictions.