DESIGN AND FABRICATION OF RETRACTABLE LANDING GEAR

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ABSTRACT

The landing gear system is one of the primary structures in the aircraft. It is a critical system that not only guides the maneuvers on runway but it also provides cushion to the aircraft structure by absorbing shock loads. It is designed as such to absorb and distribute the kinetic energy of landing impacts, thus decreasing the impact stresses on the aircraft.

The manufactured landing gear is tricycle type and it is retractable and will operate electrically. The interface is controlled by the microcontroller, which is specifically programmed for this project. The struts are made from carbon fiber which also adds novelty to the project. The landing gear doors will be of sliding type as compared to the conventional folding doors for the landing gears.

HYPOTHESIS

Retractable light weight landing gear will reduce the weight and sliding doors will reduce the drag during flight.

OBJECTIVES

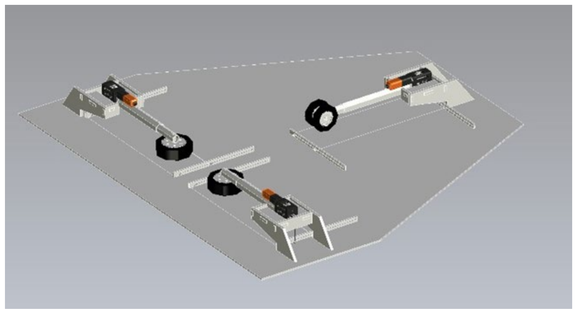
In this project, our objective was to design and manufacture the landing gear for the drone. The task was to make it light weight and to develop a mechanism that reduces the drag associated with the landing gear doors. We designed sliding doors for the landing gear i.e. the doors when in open position, will remain inside the body and thus will reduce the profile/interference drag. The system was made light weight by choosing carbon fiber material for struts, which significantly reduced the weight of the landing gears. The system is operated by programmable controller.

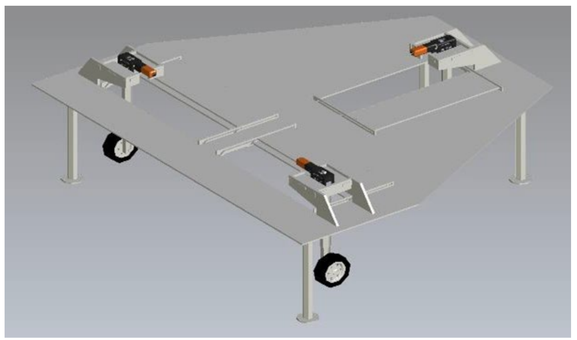
METHODS

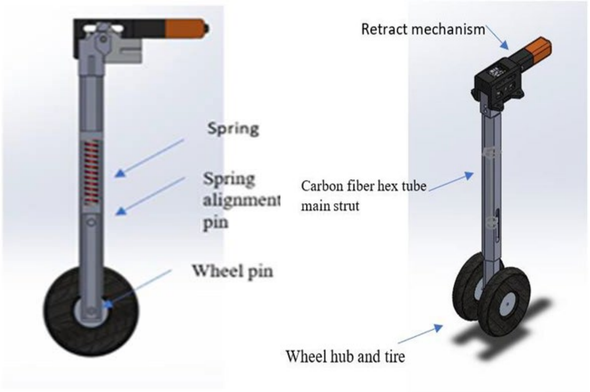
To complete this project and meet the challenge proposed by this project, we manufactured:

1. Carbon fiber shock struts.
2. Sliding doors for reduced drag.
3. Controller to operate the system.

RESULTS







CONCLUSIONS

We designed and manufactured a tricycle retractable landing gear for the drone. In contrast to the traditional folding landing gear doors, the landing gear doors will be sliding and made from composite.

For the future recommendations, electromagnetic brake can be installed along with steering system of the nose landing gear. Radio and receiver can be used to operate the system.