Raspberry Pi Drone Design Document

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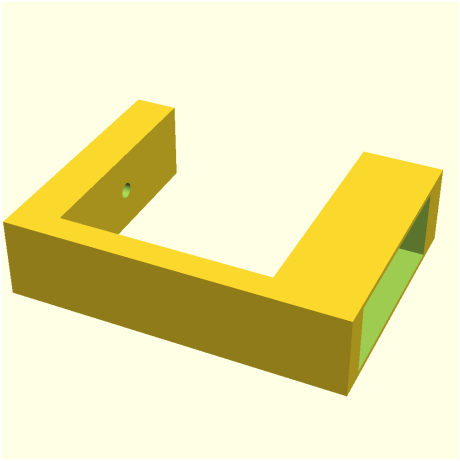

Fig. 1. The tilt gimbal base.

I. Introduction

This document outlines the design and construction of a small drone for field testing of an autonomous landing algorithm. The drone body is entirely 3D printed for relatively easy production. This drone extends a simple drone design that is available at [2]. Additions to the original design are specified in `.scad` files, and the entire drone design is available at [1].

II. CAD Design

The first addition to the original drone is a small tilt gimbal (shown in Figures 1 and 2), that is mounted on the front of the drone. The tilt gimbal includes a mount for a standard Raspberry Pi camera module and a space for a micro servo that serves as the gimbal's actuator. Its rotational axis is supported by a single screw and the rotational axis of the micro servo. The camera module is attached with screws, and its ribbon cable extends upwards above the drone body.

The second addition is a set of mounts for the drone's electronic speed controllers. The speed controllers fit into slots on the drone's body and are held in place simply with electrical tape.

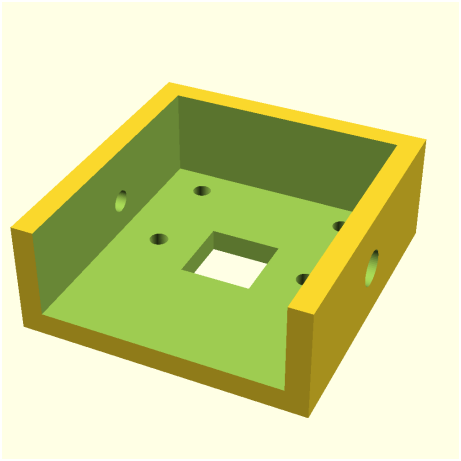

Fig. 2. The tilt gimbal camera mount.

References

[1] Joshua Springer. RPi Drone, 2021.
[2] Thingiverse.com. Raspberry Pi Drone (NIACAM: TXSEF 2016-2017) by arks007, 2017.