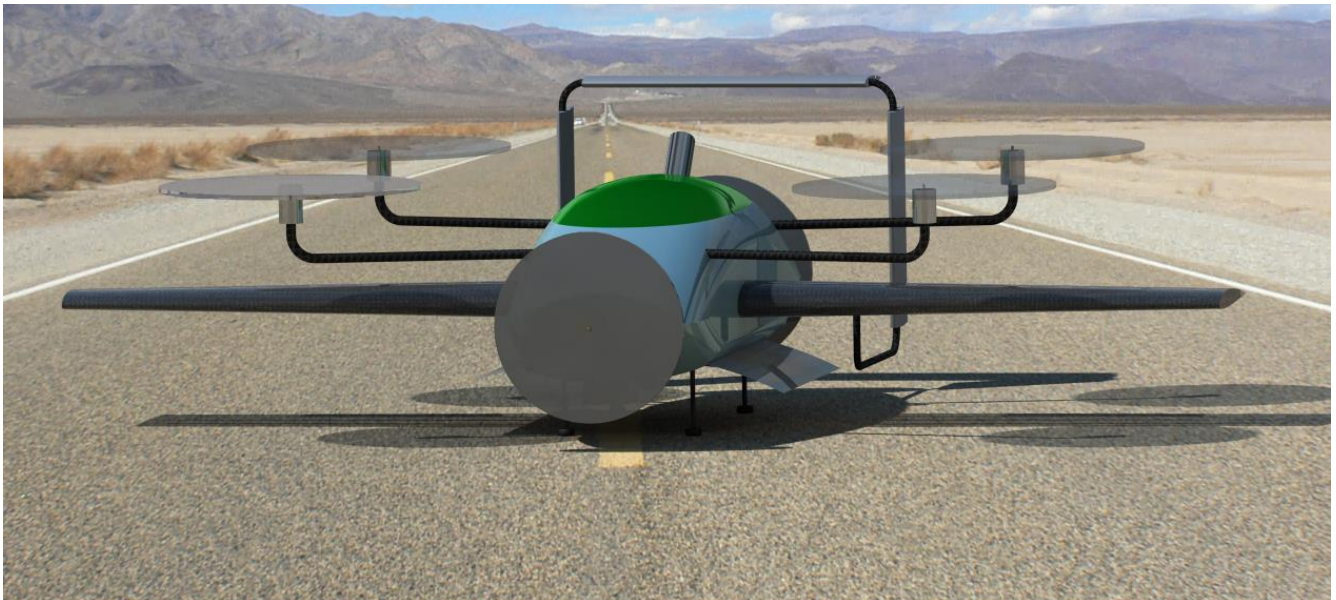




Report regarding Modularity of Cargo Drone

Hygeia Ex Machina



First Aid Cargo Drone

May 2016



Brief Introduction & Description

In this report the disassembly of the aircraft for storage and transportation is presented. The whole structure can be divided into smaller components that are easier to handle and store for transportation/shipability purposes. The steps required for this procedure are only 6 and are briefly presented here.

Step 1: Unplugging Wings

Wings are locked on fuselage using lock pins which can be accessed from the lower part of the wing near the root. When the pins are unplugged the wings can be separated from fuselage structure.

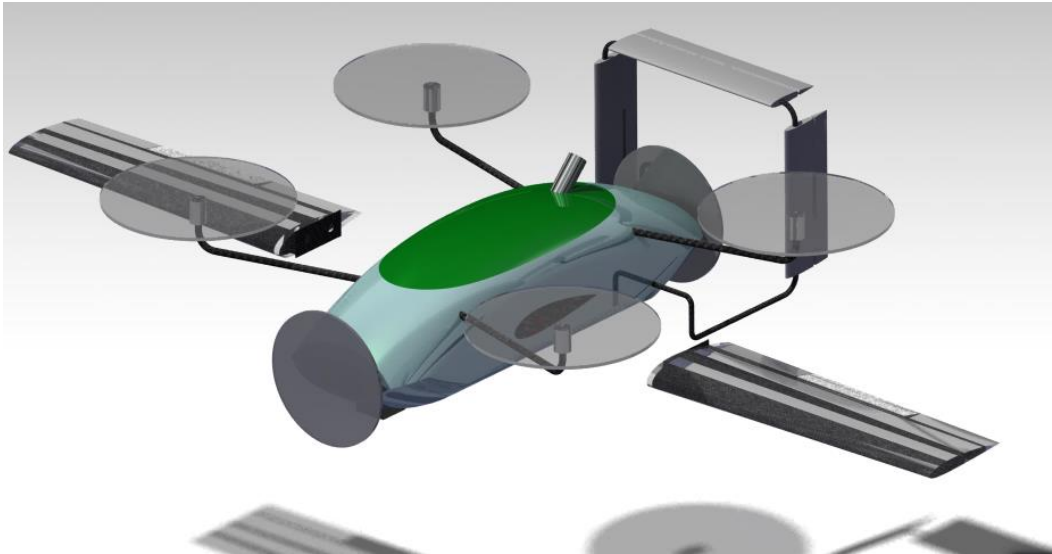


Figure 1: Unplugged Wings

Step 2: Removing Upper Surface Skin

The skin structure on the upper aerodynamic surface of the aircraft is connected with the fuselage structure using simple push clips like the one demonstrated in Figure 2. When the upper surface skin is removed the part of the inner structure is available for maintenance or adjustments. The securing parts of the VTOL motors support arms are also accessible. By turning the screws securing the support arms the latter can be removed.



Figure 2: Push Clip

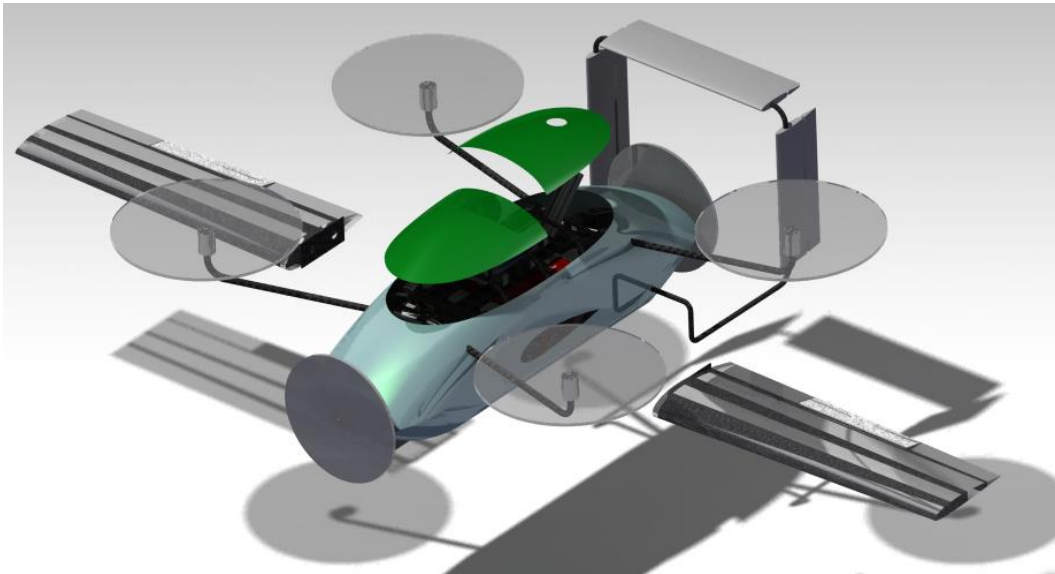


Figure 3: Removed of Upper Surface

Step 3: Unplugging VTOL Support Arms

When the support arms of the VTOL motors are unplugged they can be easily removed from the aircraft and stored. Here it should be noted that they can be replaced with different arms with different motors given that the wiring for providing power is the same.

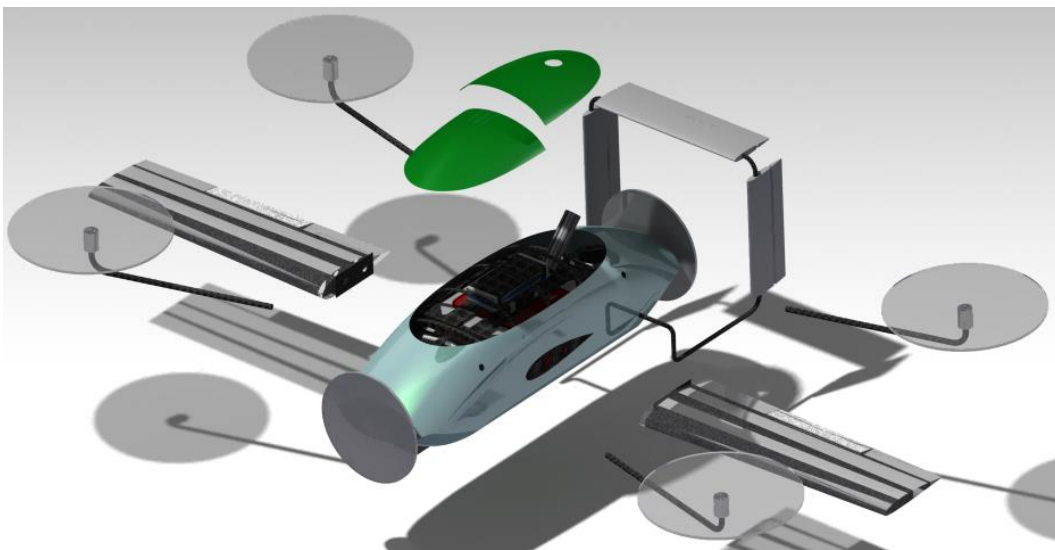


Figure 4: Unplugging VTOL Motors Support Arms

Step 4: Folding Horizontal and Vertical Tail

Horizontal and vertical tail can be folded to reduce the requiring storage space.

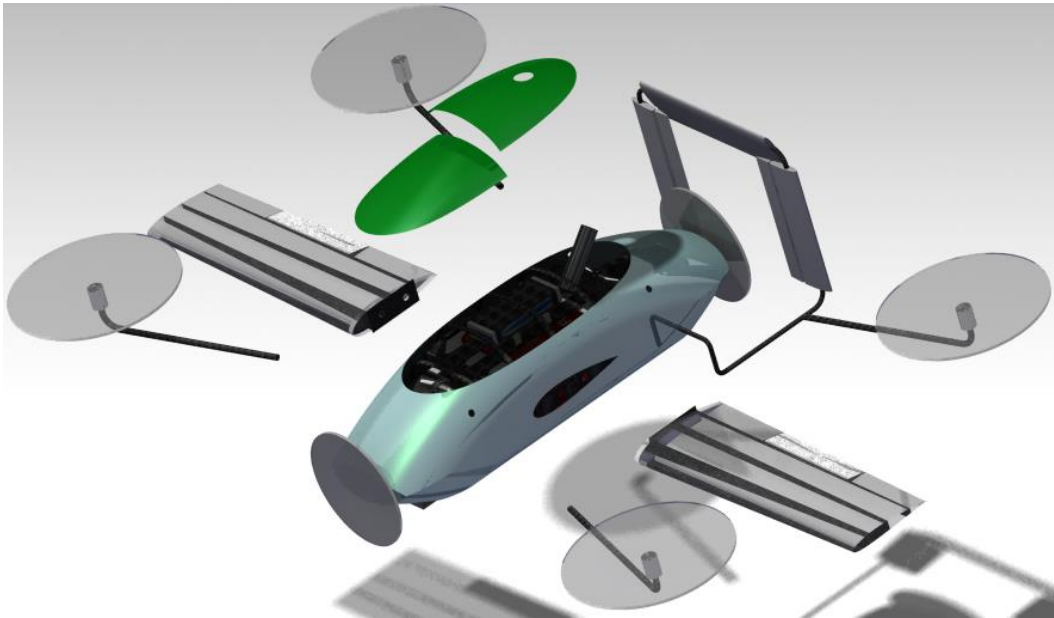


Figure 5: Horizontal and Vertical Tail Folded

Step 5: Placing Upper Skin & Folding Tail Compartment

While part of the inner structure is accessible the support joint of the tail that is connected rigidly with the fuselage plate can be located. The support joint can permit the tail compartment to rotate around proper axis in order to be folded and reduce storage space. When the upper skin is placed again the tail compartment can be folded as shown in Figure 6.

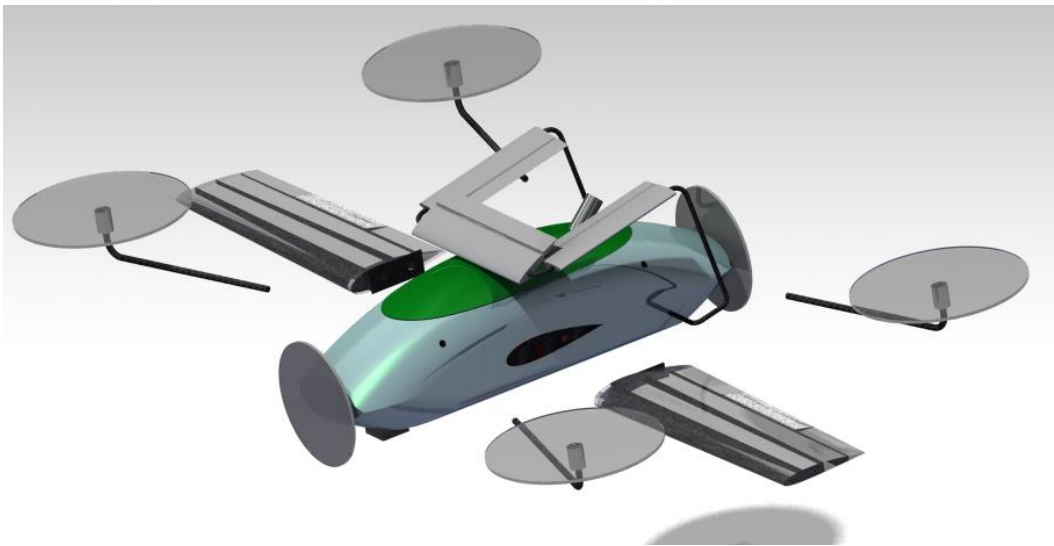


Figure 6: Upper Skin Placed and Tail Compartment Folded

Step 6: Storage

In this last step all the disassembled components are gathered and placed inside a box for transportation. In the following figures the parts have been placed inside a box having dimensions 1500x850x700. The box dimensions can be further decreased if the components are placed carefully in predefined positions.

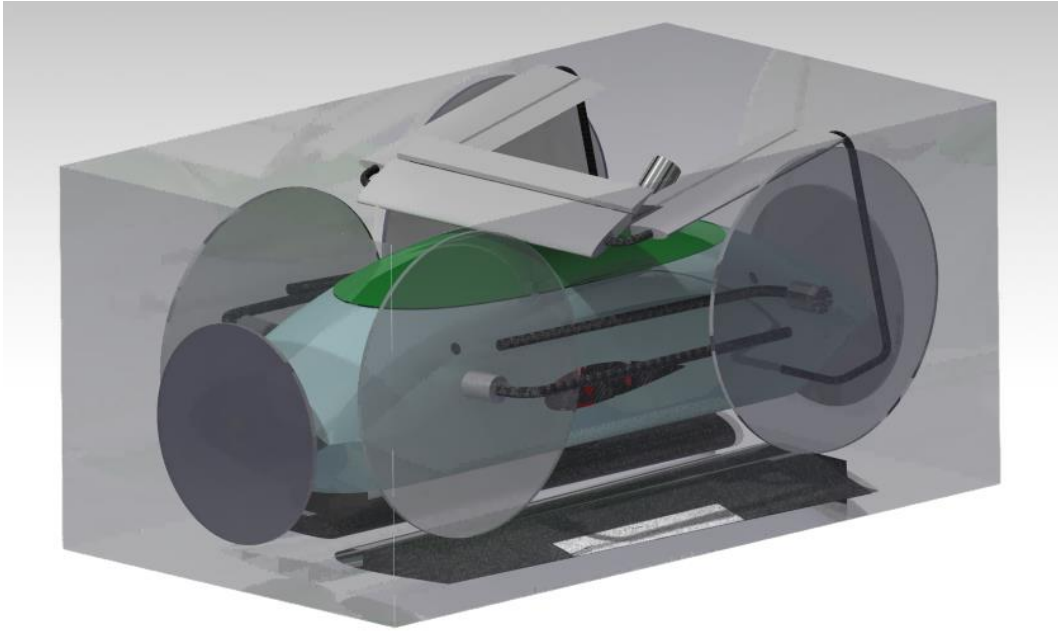


Figure 7: Aircraft inside Transportation Box – Isovview

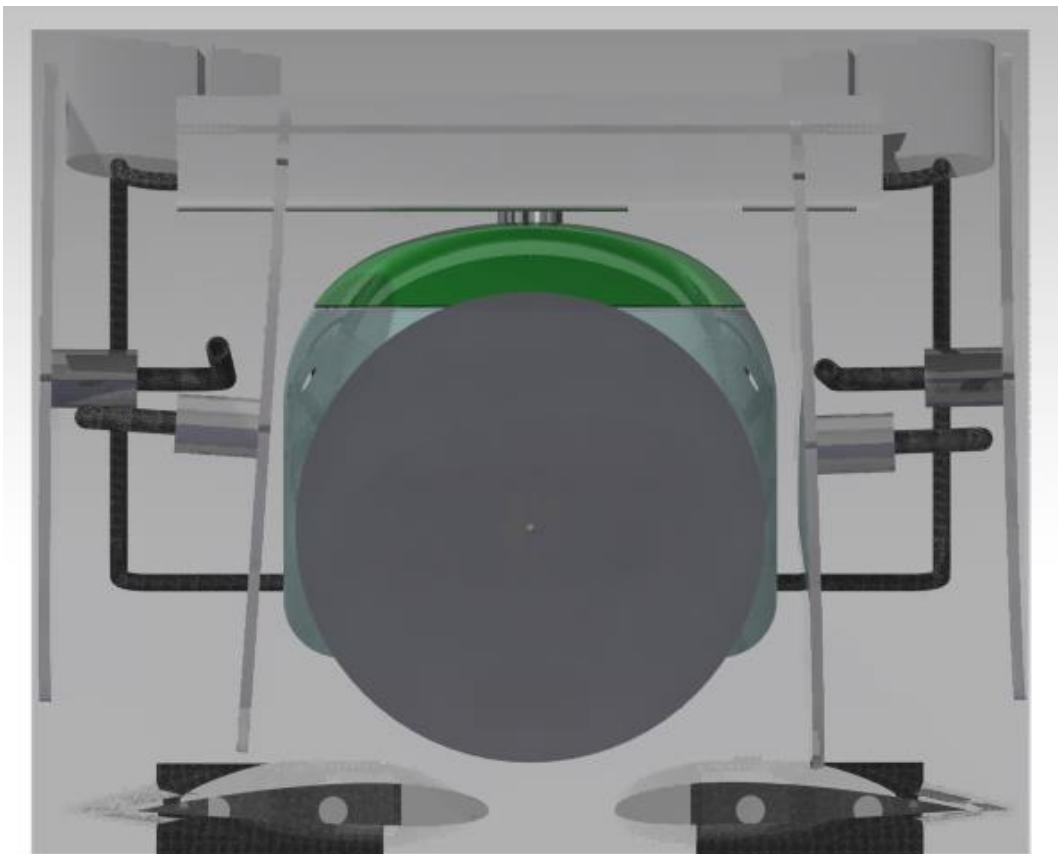


Figure 8: Aircraft inside Transportation Box – Front View

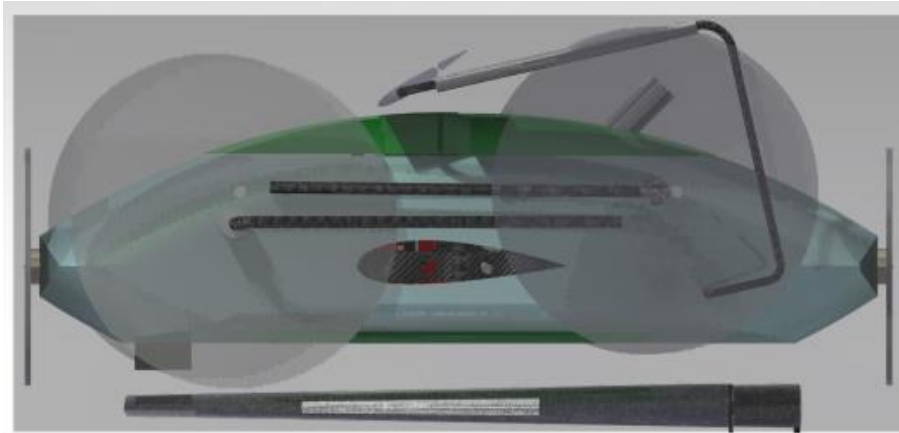


Figure 9: Aircraft inside Transportation Box – Side View