

The JAviator: A High-Payload Quadrotor UAV with High-Level Programming Capabilities

Rainer Trummer

Computer Sciences Workshop '08
Department of Computer Sciences
University of Salzburg, Austria

The JAviator (Java Aviator) Project

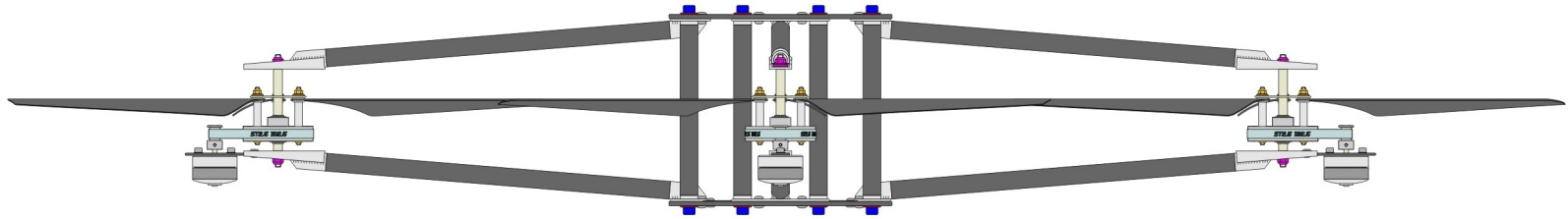
- Collaborative research project of the
 - Computational Systems Group, Department of Computer Sciences, University of Salzburg
 - IBM T. J. Watson Research Center, Hawthorne, New York, USA
- Primary project goals are to
 - develop high-level real-time and concurrent programming abstractions for Java
 - provide an infrastructure that is time-portable
 - verify system on UAV (unmanned aerial vehicle)

JAviator Design Evolution

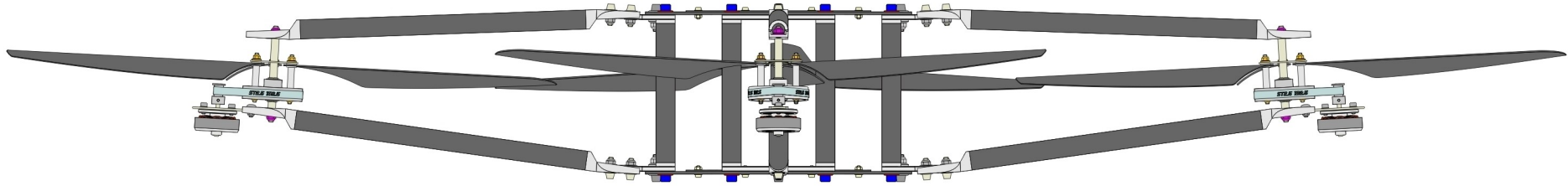
- Prototype version: JAviator V1
 - Entirely hand-manufactured (including motors)
 - Total diameter (over spinning rotors): 1.1 m
 - Empty weight (including electronics): 1.9 kg



JAviator Design Evolution



JAviator Design Evolution

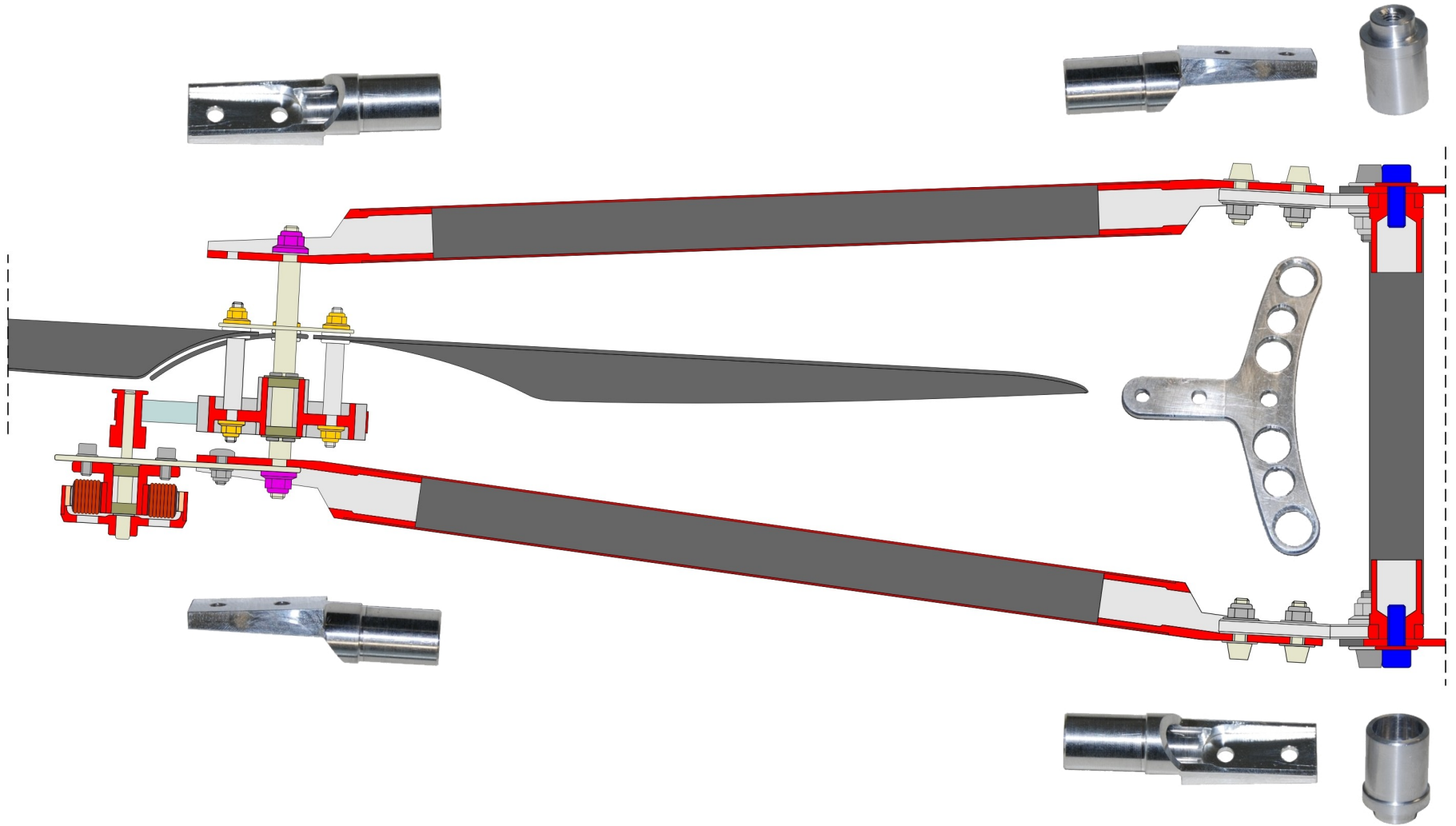


JAviator Design Evolution

- Advanced version: JAviator V2
 - CNC-fabricated, flow-jet, and laser cut components
 - Total diameter (over spinning rotors): 1.3 m
 - Empty weight (including electronics): 2.2 kg



Side-Arm Details



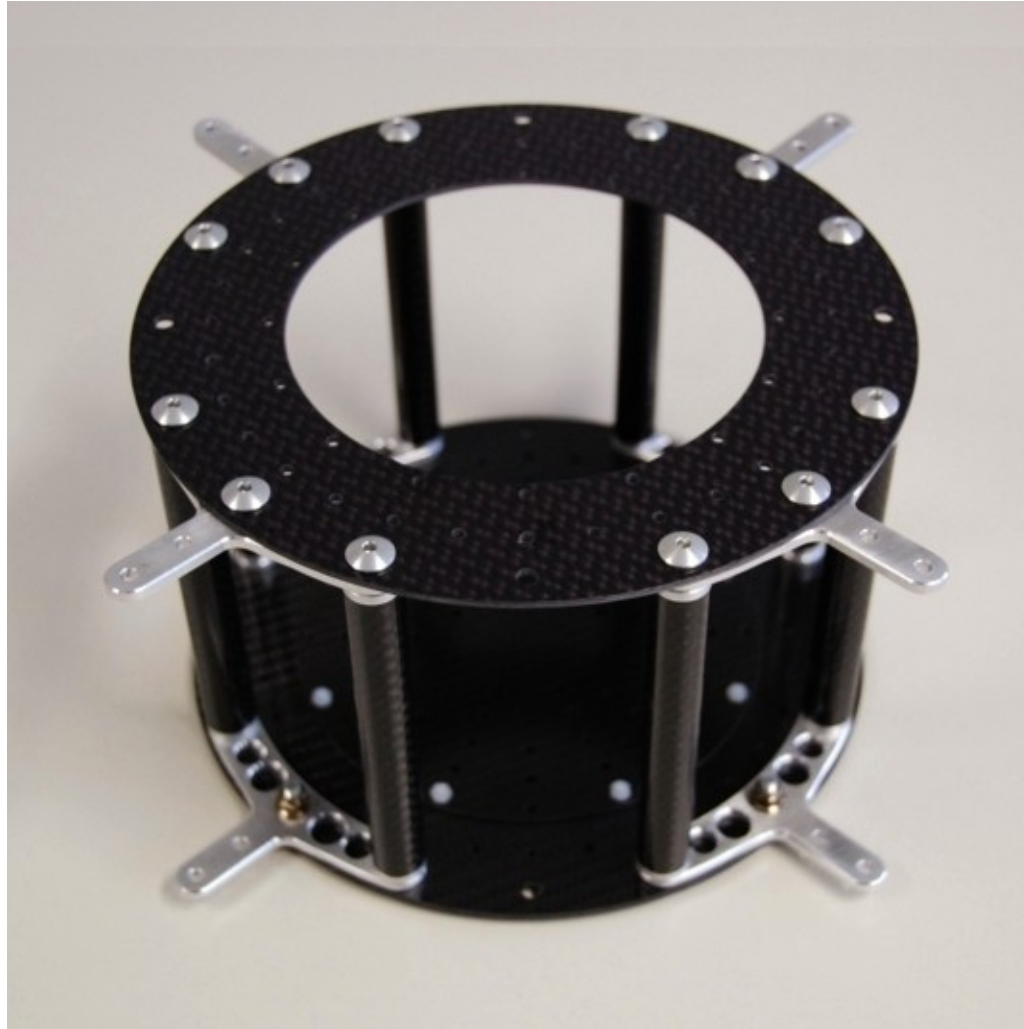
Frame Construction



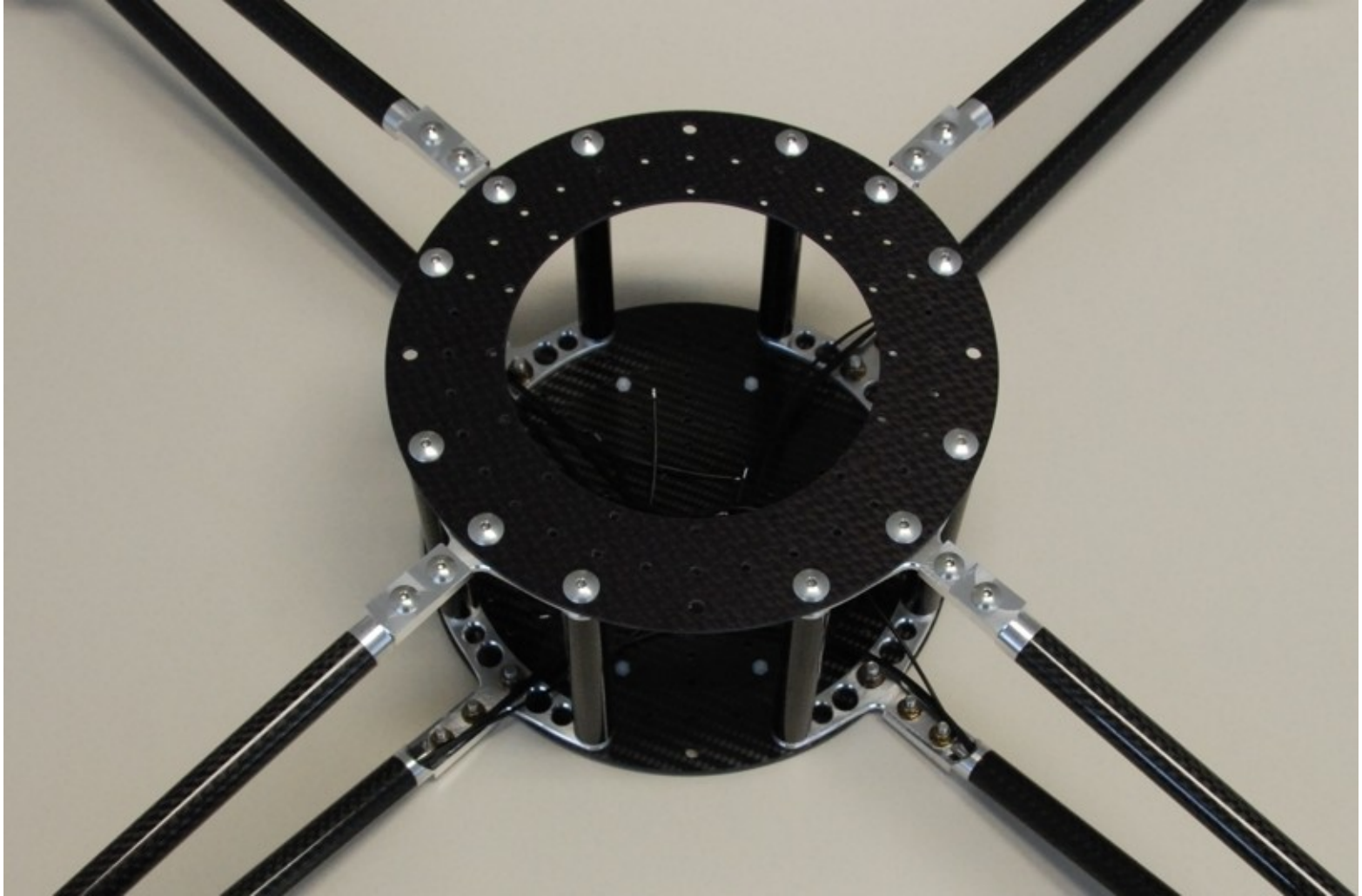
Frame Construction



Frame Construction



Frame Construction



Frame Construction



Propulsion System



Propulsion System



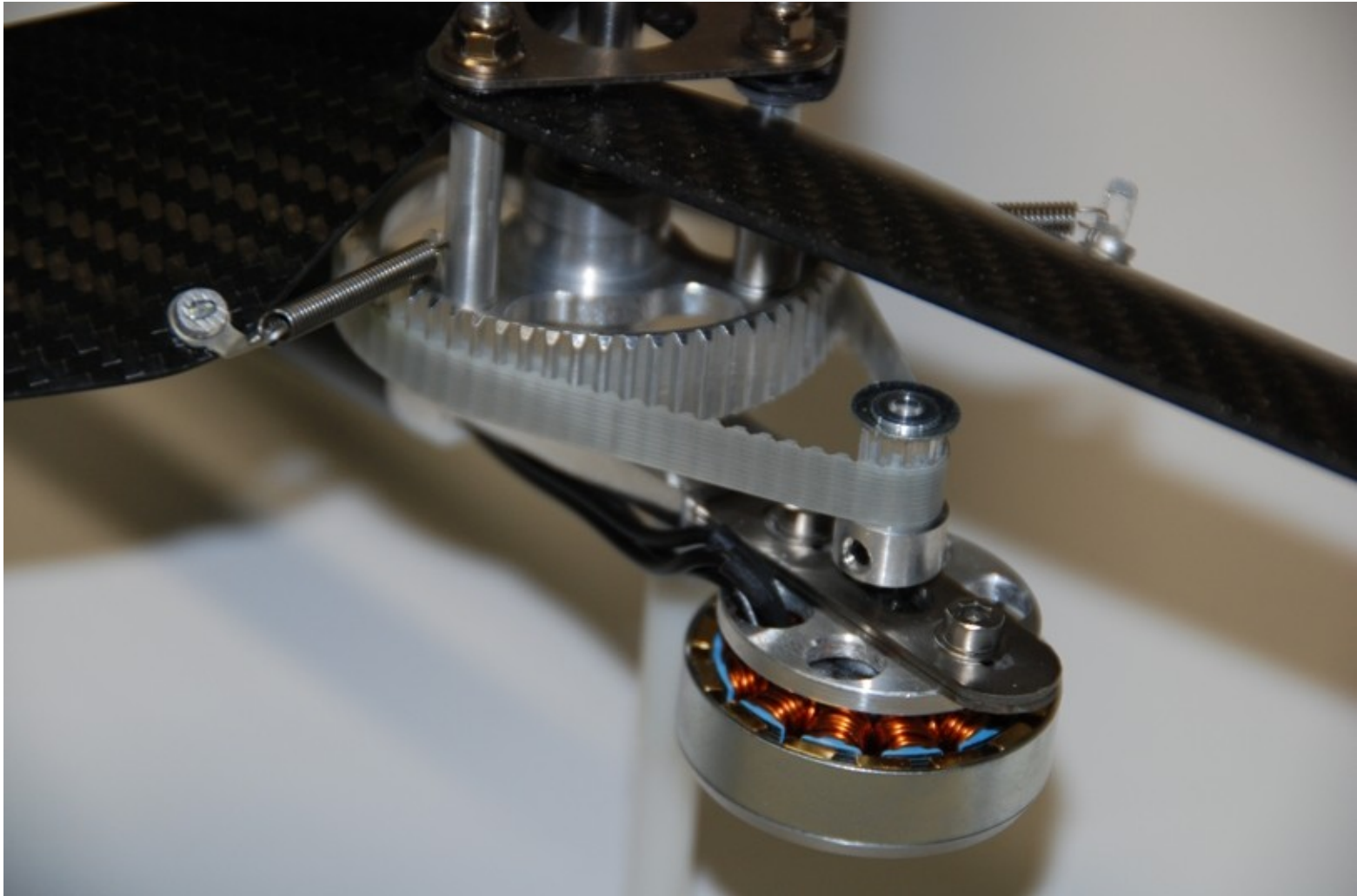
Propulsion System



Propulsion System

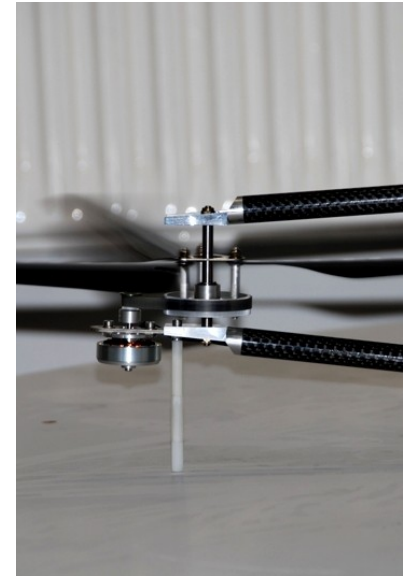
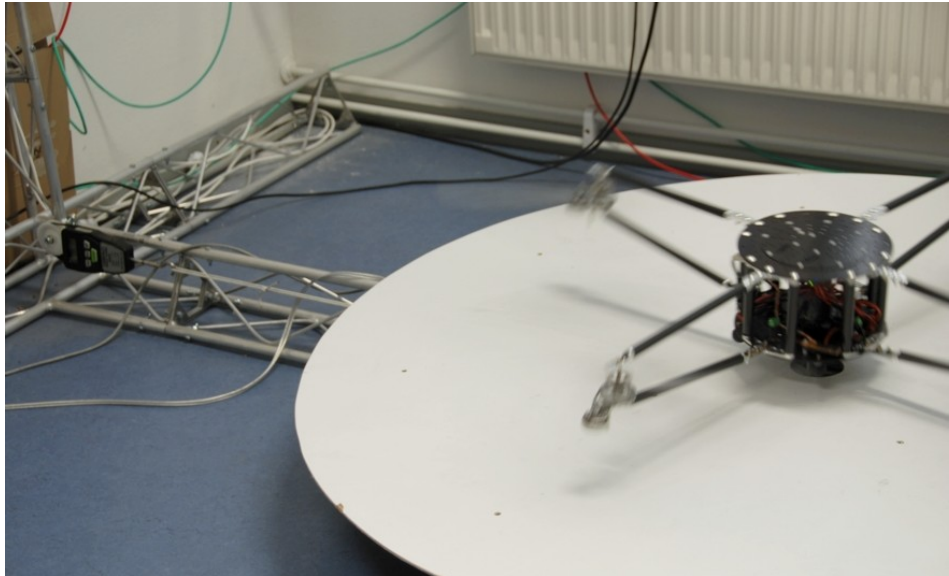
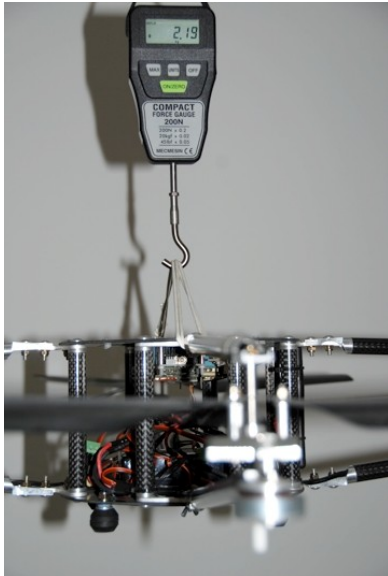


Propulsion System



Propulsion Capacity

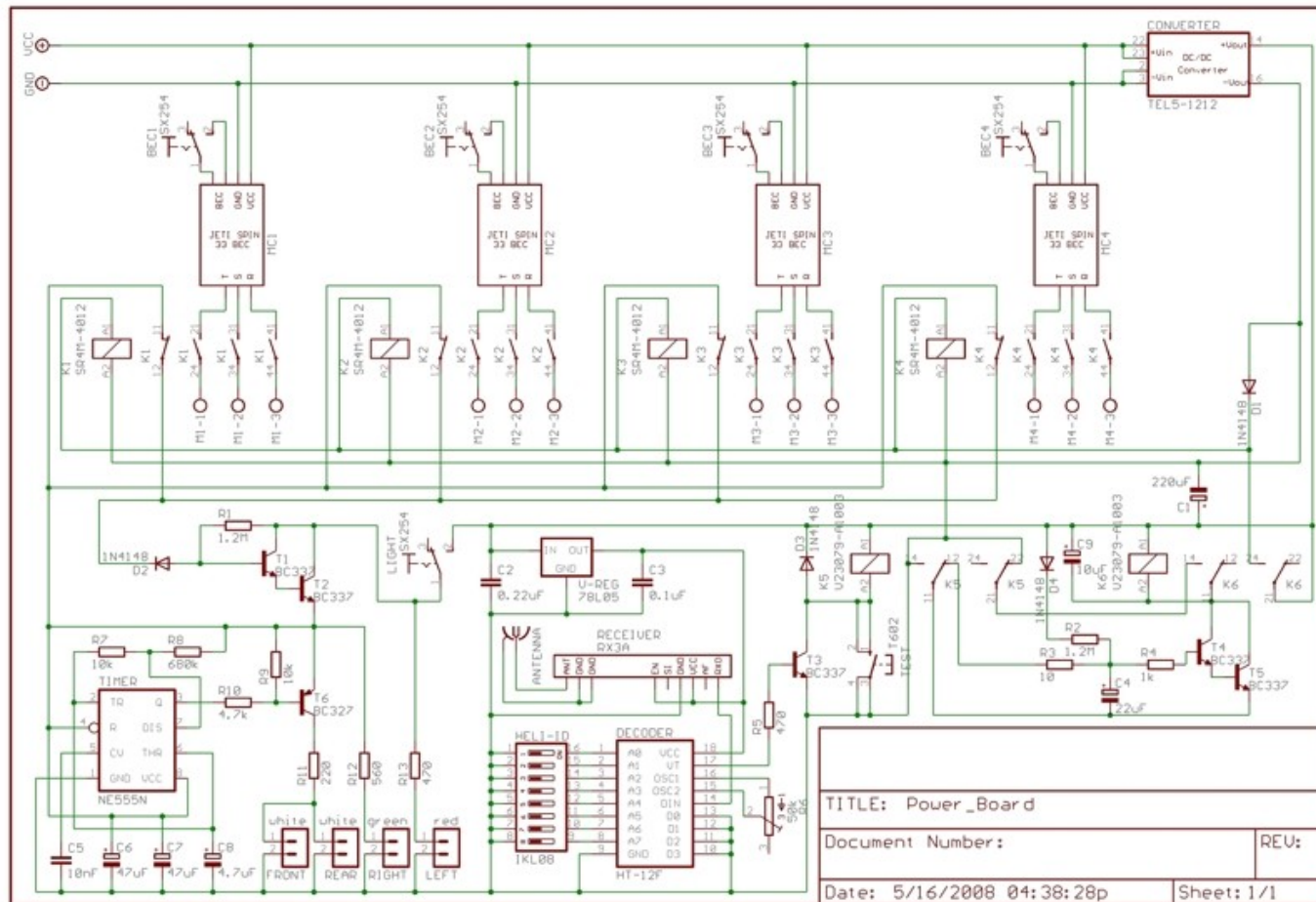
- Maximum lift capacity: 5.4 kg
 - 2.2 kg empty weight + 3.2 kg payload
- Maximum flight time: 40 min
 - 40 min w/o payload down to 8 min with 3.2 kg



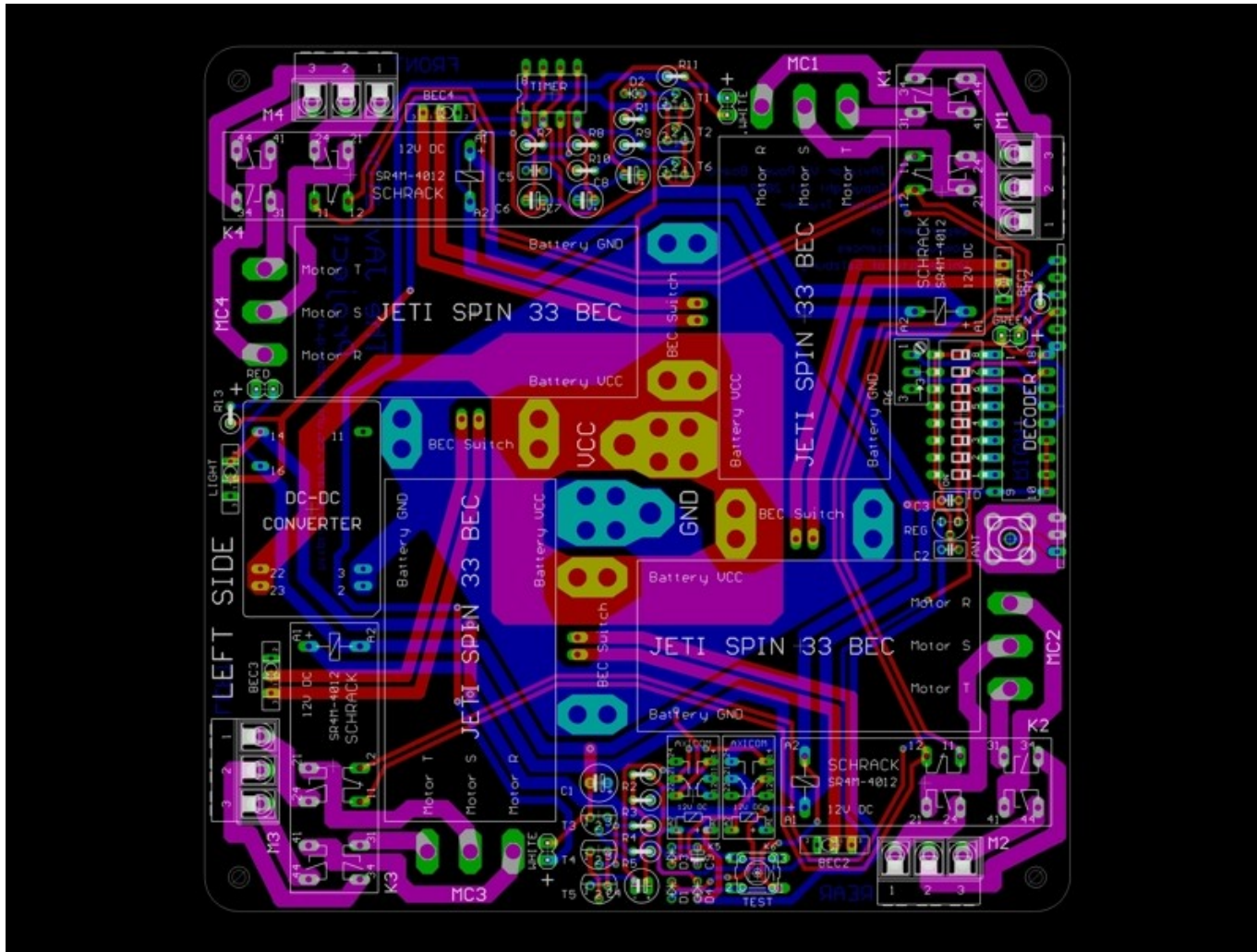
Power Board Design

- Need for central board containing ...
 - four motor controllers
 - high-current circuit breaker
 - R/C emergency shutdown
 - signal-lights mechanism
 - low-voltage power supply

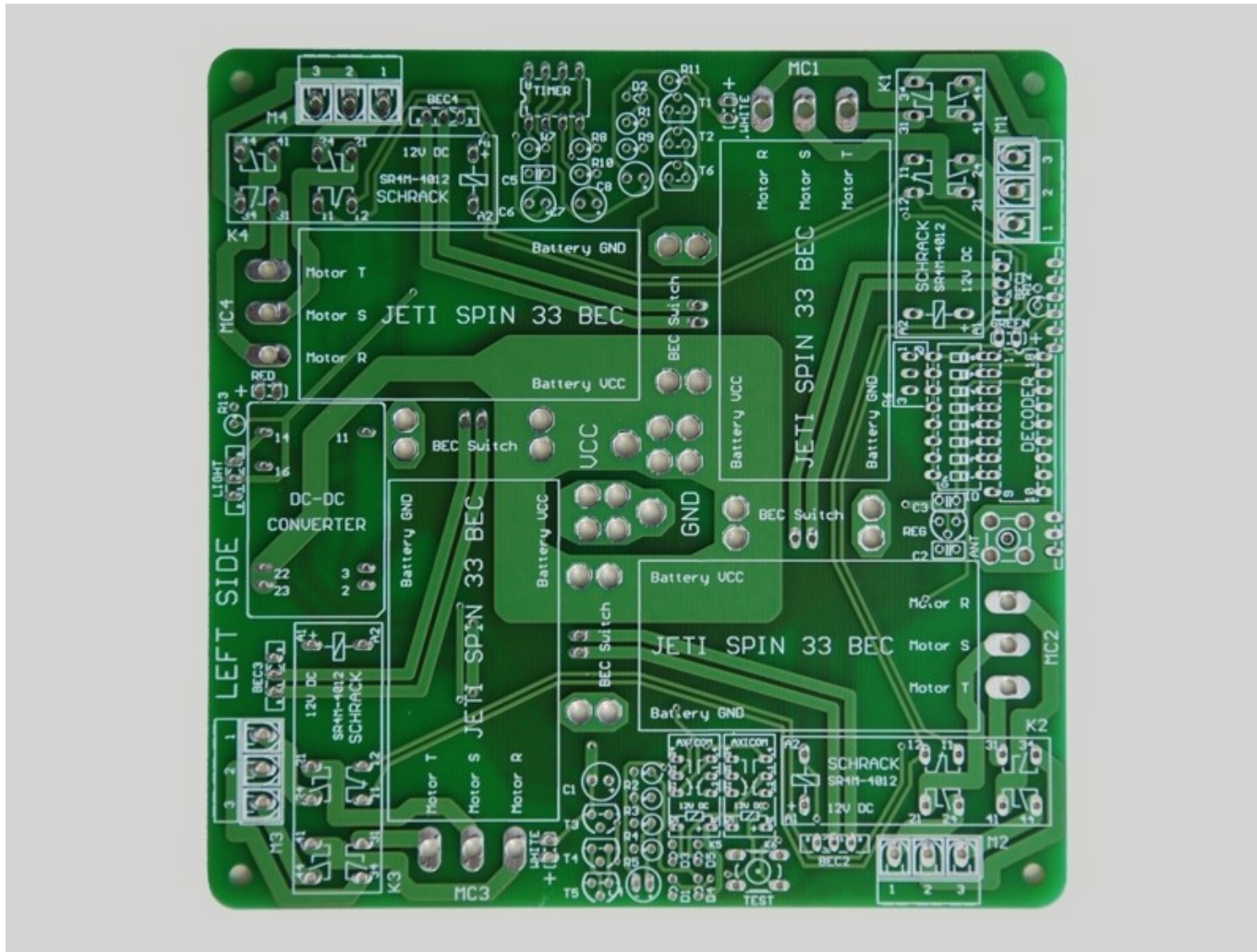
June 2008



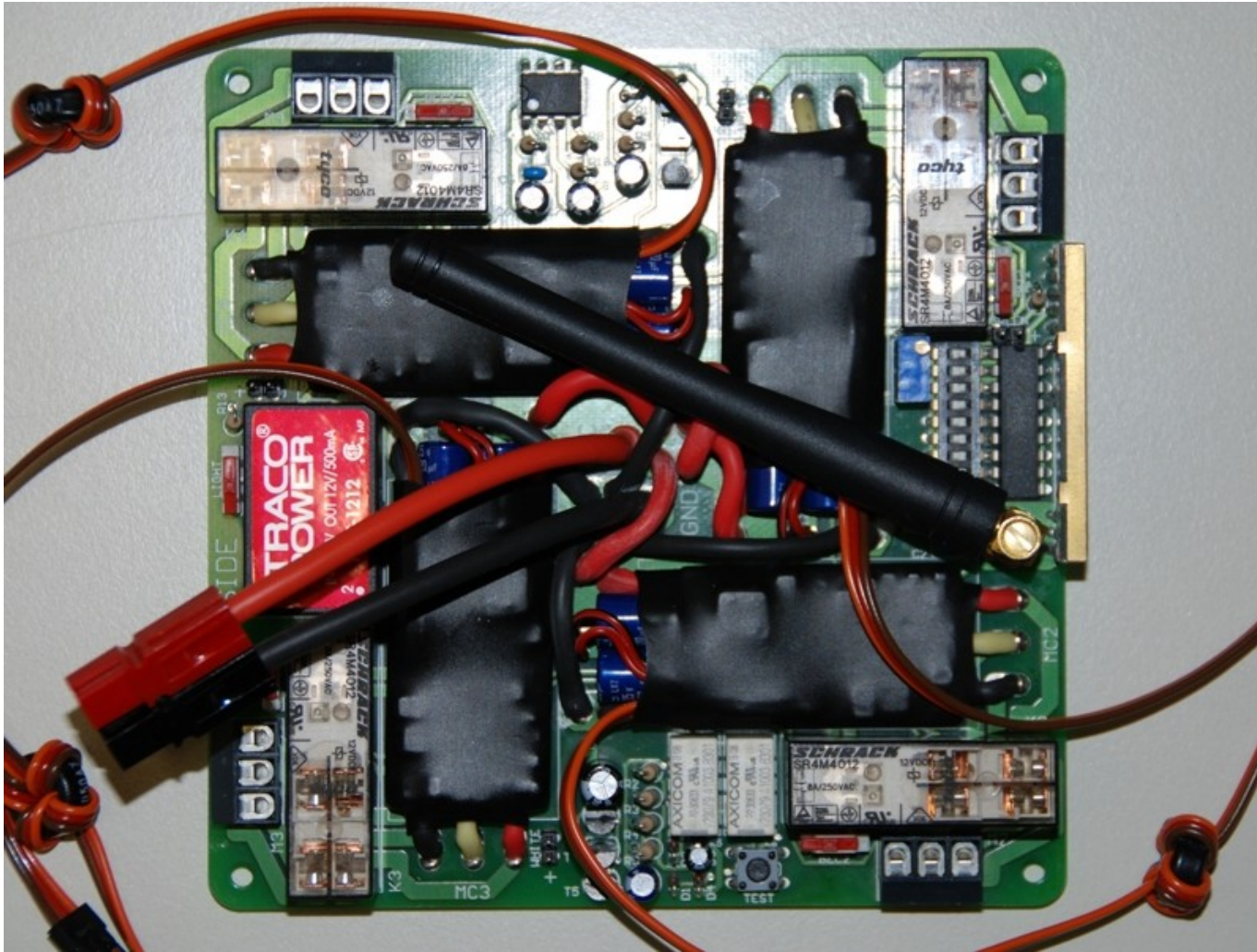
Power Board Design



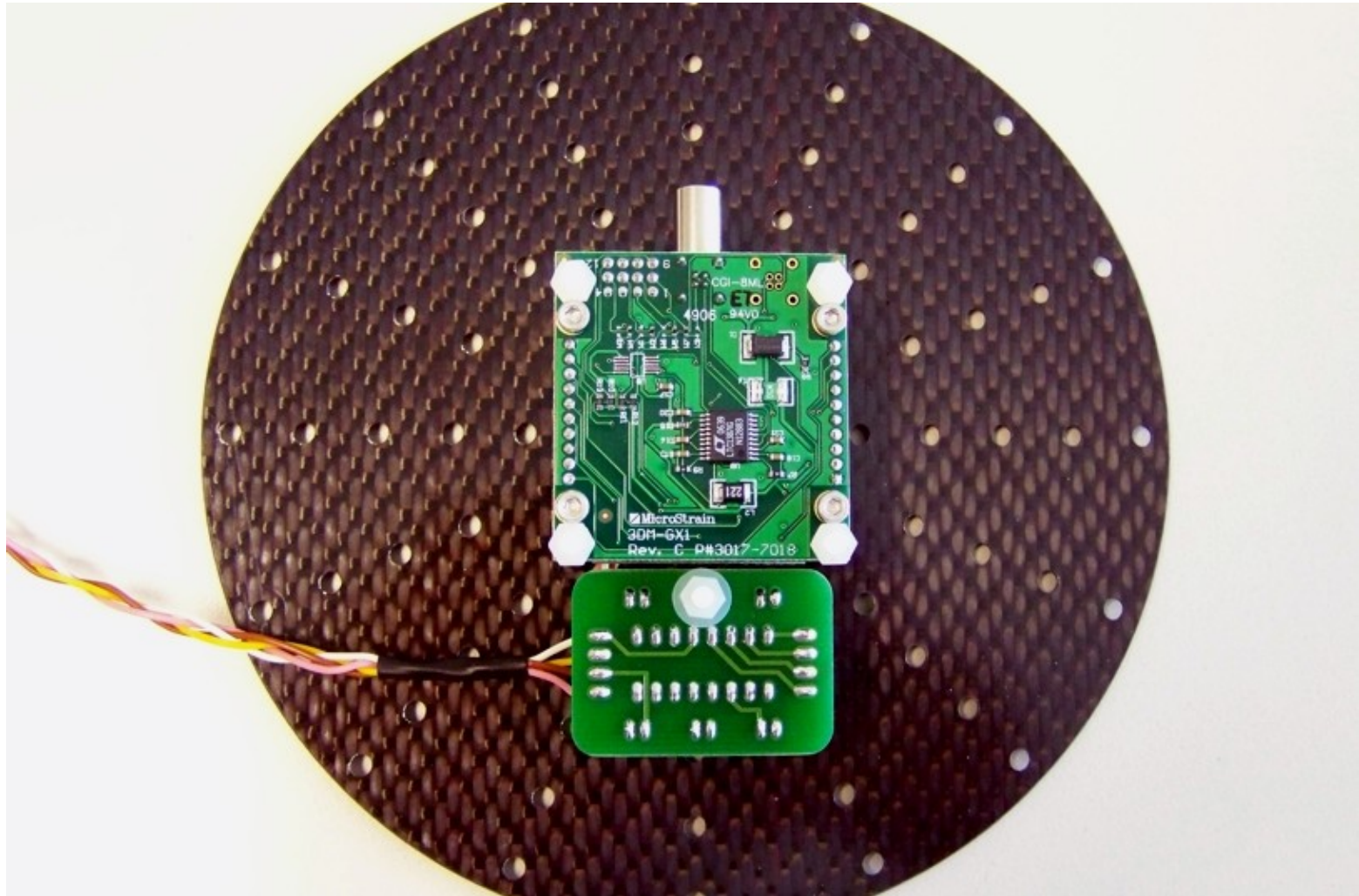
Power Board Design



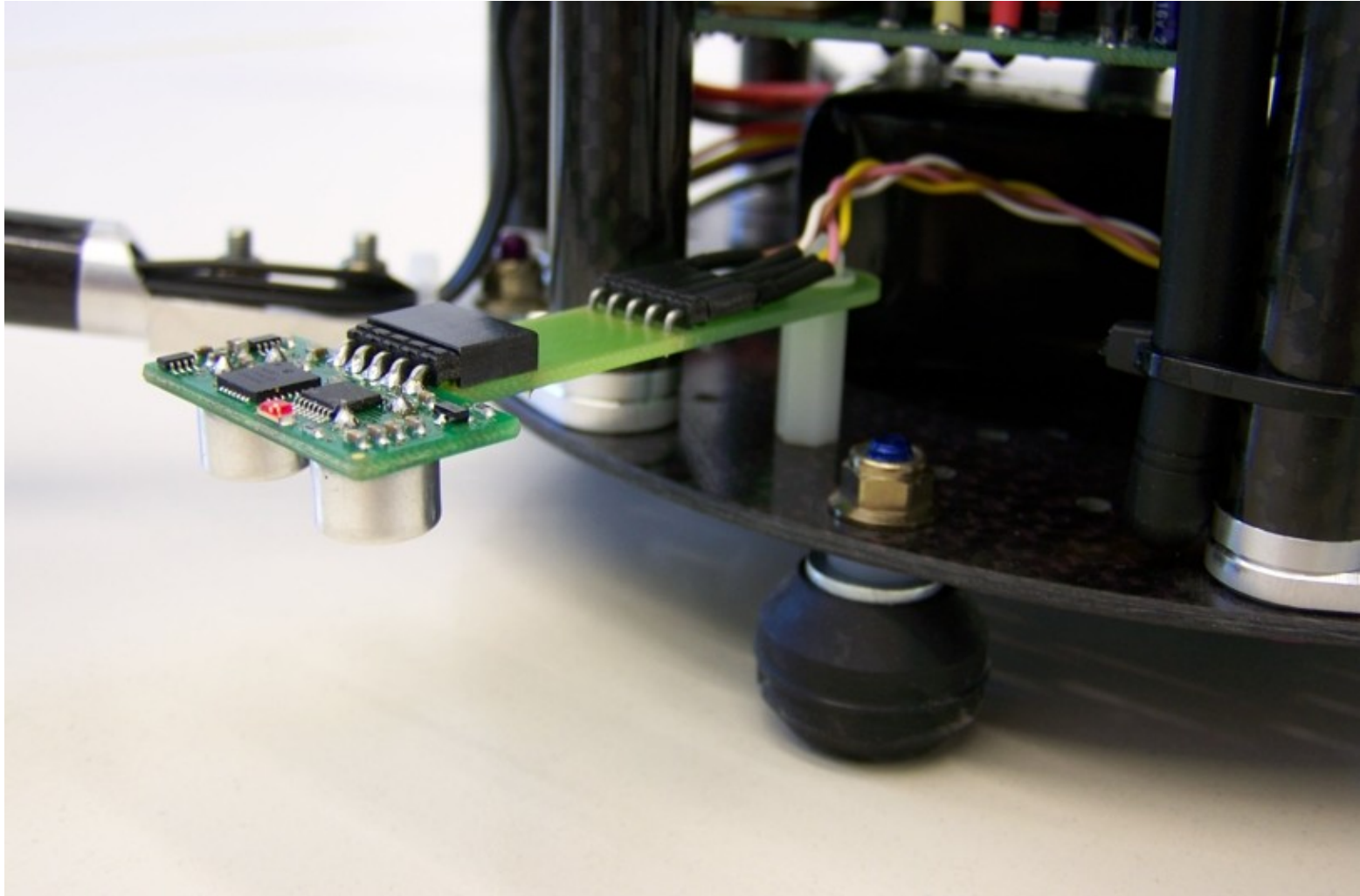
Power Board Design



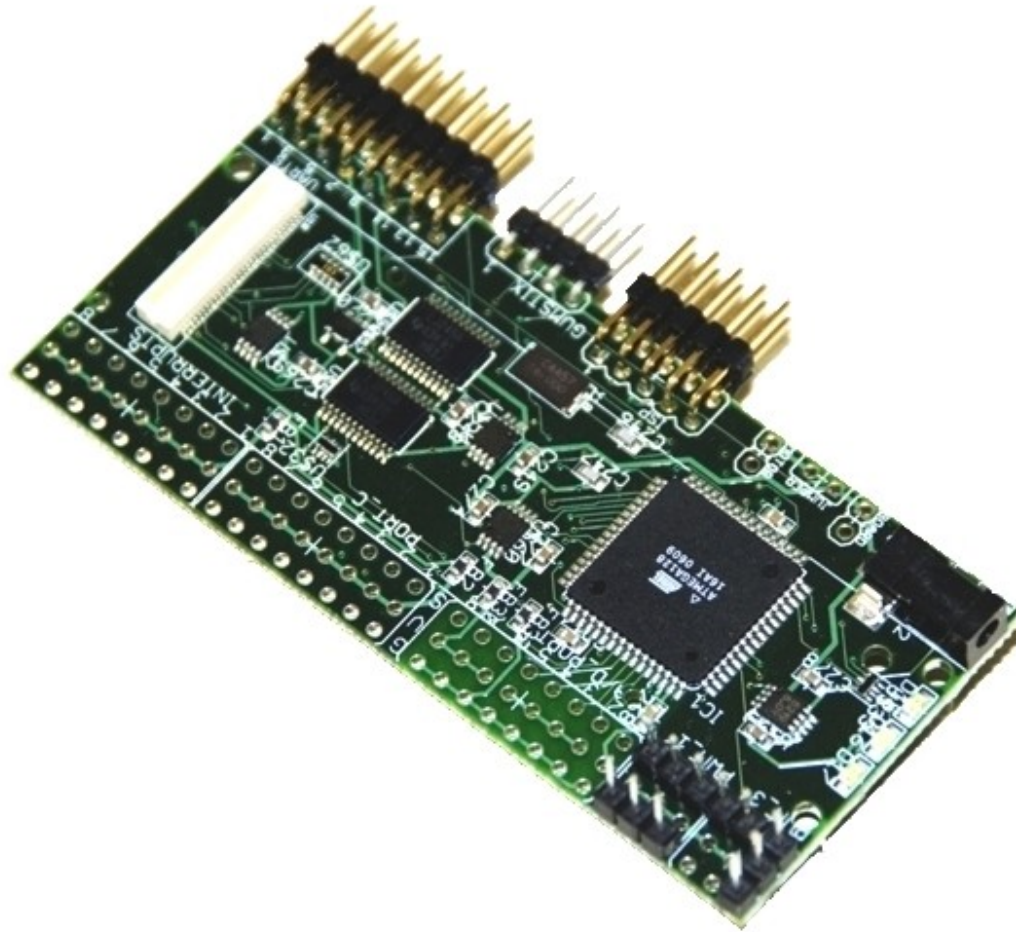
Avionics System



Avionics System



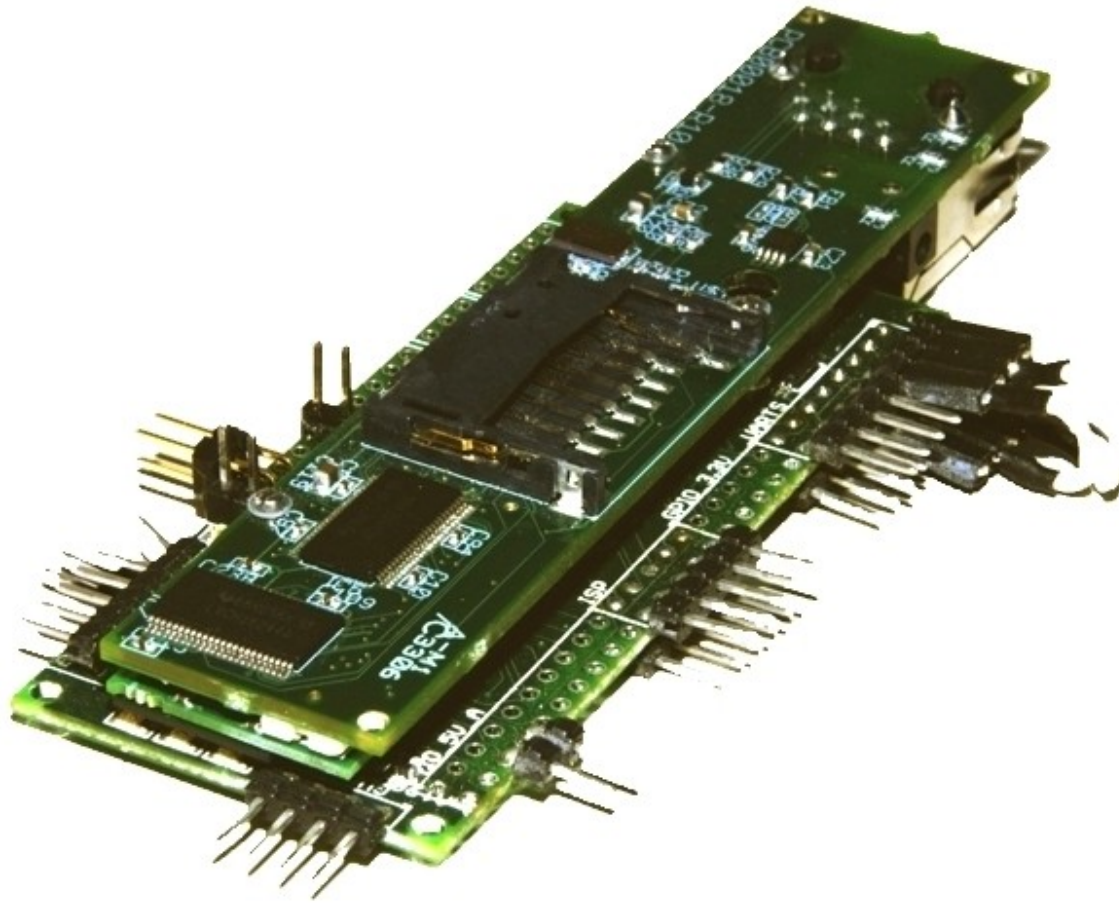
Avionics System



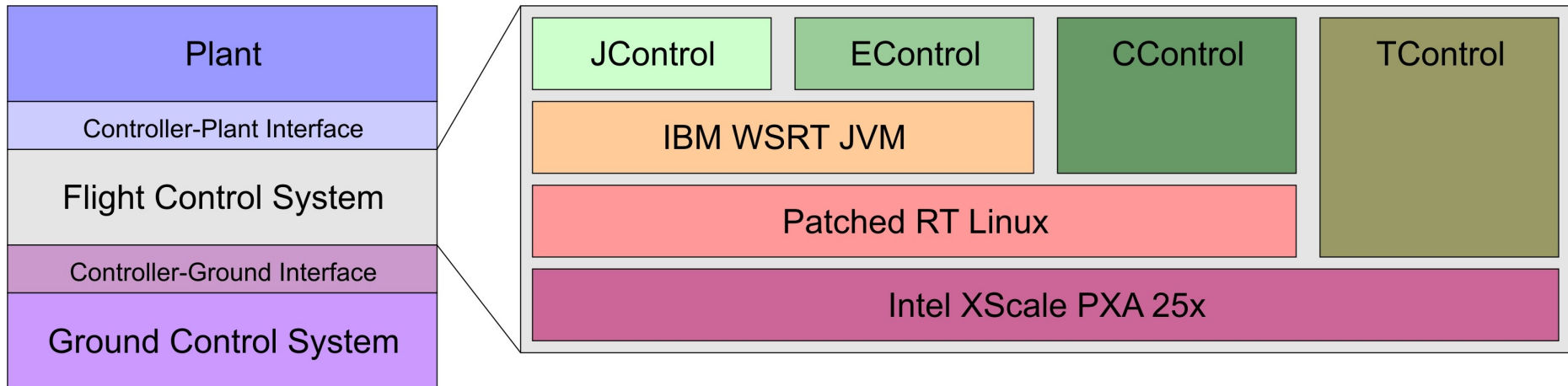
Avionics System



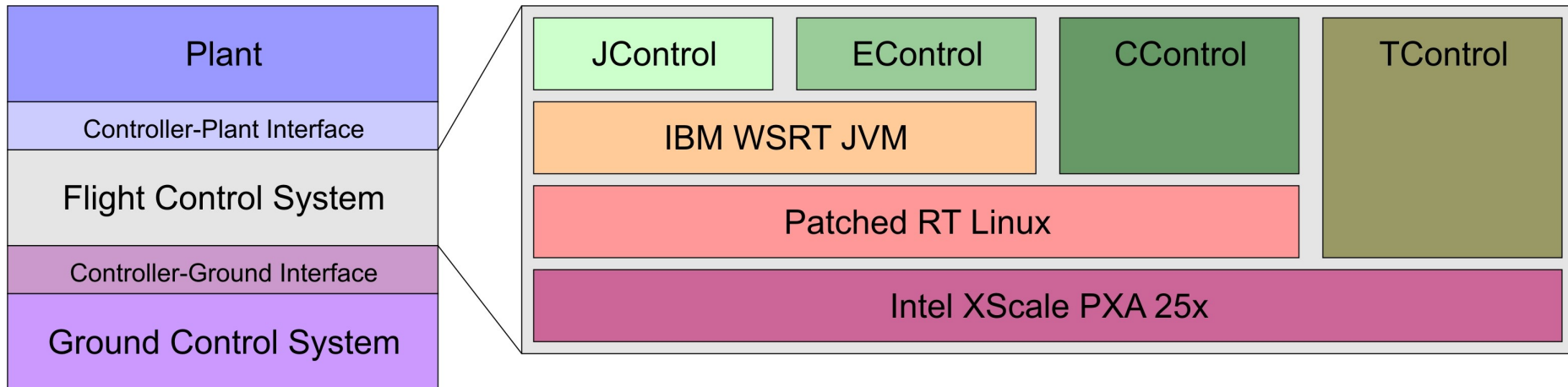
Avionics System



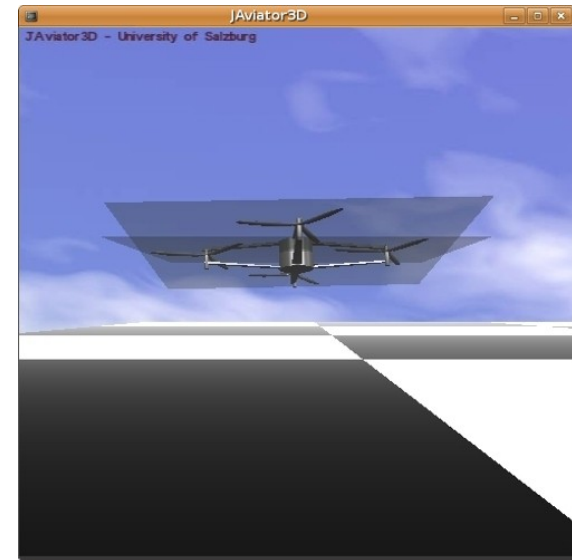
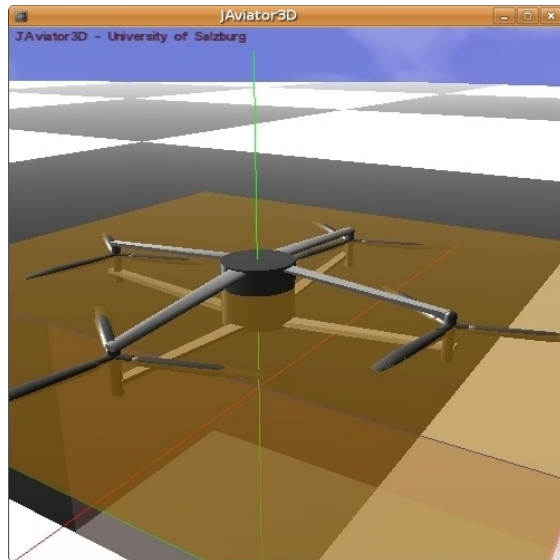
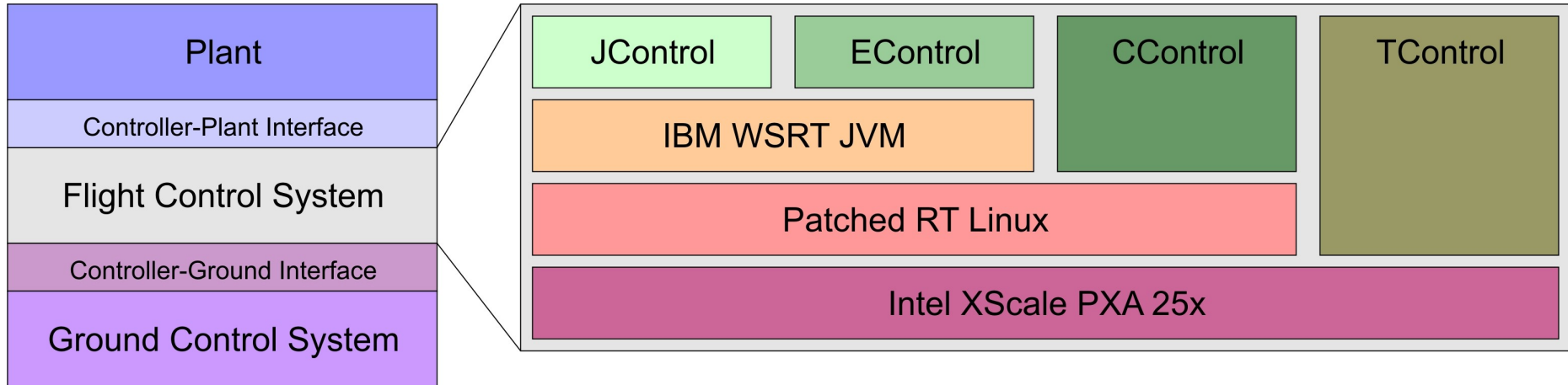
Software System



Software System



Software System



Upcoming Event

The poster features a satellite with two large solar panels extending outwards, set against a dark blue background with a glowing, orange-hued nebula or galaxy. The text is white and red, providing event details.

AIAA Guidance, Navigation, and Control
Conference and Exhibit

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Hawaiian Convention Center, Honolulu, Hawaii

www.aiaa.org/events/gnc

Thank You and ...

Aloha!