CLAIMS

We claim:

1. An unmanned aerial vehicle comprising:

a power source;

a processor module comprising one or more processors; and

a plurality of boom arms, each boom arm being physically connected to a printed circuit board (PCB) and a plurality of propellers;

wherein a PCB of each boom arm comprises a power hub electrically connected to the power source and to corresponding propellers of the boom arm, and a signal hub electrically connected to at least one processor of the one or more processors and to the corresponding propellers;

wherein the power hub of each PCB comprises a plurality of selector switches corresponding to each of the plurality of corresponding propellers, wherein the power hub of each PCB is configured to transfer power from the power source to the corresponding propellers when the selector switches are in the engaged state, and wherein the signal hub of each PCB is configured to transfer signals from the one or more processors to the corresponding propellers, wherein the processor module controls the plurality of propellers.

2. The UAV of claim 1, further comprising a sensor module comprising at least one sensor, wherein the sensor module is electrically connected to the processor module, and wherein the signal hub of each PCB is configured to transfer signals from the processor module to the corresponding propellers, wherein the processor module controls the plurality of propellers based at least in part on sensor data of the sensor module.

3. The UAV of claim 2, further comprising a wing and a fuselage, wherein the wing and fuselage each comprise one or more sensors of the sensor module, and wherein the wing further comprises a plurality of propellers controllable by the processor module.

4. The UAV of claim 2, wherein the PCBs of the UAV are incorporated into the wing, and wherein each PCB is electrically connected to the corresponding propellers via electrical leads connected to the booms.

5. The UAV of claim 1, wherein each PCB that corresponds to a boom arm further comprises a processor, and wherein the processor module of the UAV comprises the processors of each PCB and a central processor of the UAV.

6. The UAV of claim 5, wherein the PCB associated with each boom arm is further configured to serve as a controller area network (CAN) bus node of the UAV.

7. The UAV of claim 1, wherein at least one of the boom arms further comprises a tail and a servo, wherein the tail moves based on movement of the servo, and wherein the signal hub of the PCB associated with the at least one boom arm is configured to transfer signals from the processor module to the servo, wherein the processor module controls the movement of the servo.

8. The UAV of claim 1, wherein the plurality of boom arms consists of four boom arms, and wherein each of the four boom arms comprises three propellers.

9. The UAV of claim 1, wherein the PCBs are connected in parallel via a high voltage end of the power source and a low voltage end of the power source.

10. The UAV of claim 1, wherein the corresponding propellers are connected in parallel via the power hub when the selector switches are in the engaged state.

11. The UAV of claim 1, wherein the one or more processors are configured to control motor controllers that correspond to the plurality of corresponding propellers based on an engagement state of one or more of the selector switches.

12. The UAV of claim 1, wherein the processor module is configured to control each of the selector switches of the power hub to produce a duty cycle, wherein the processor module serves as a motor controller for each of the corresponding propellers.

13. An electrical system of an unmanned aerial vehicle comprising:

a power source;

a processor module comprising one or more processors;

a plurality of propellers comprising a plurality of subsets of propellers, wherein each subset of propellers corresponds to one of a plurality of boom arms of the UAV; and

a plurality of printed circuit boards (PCBs), wherein each PCB of the plurality corresponds to one of the plurality of boom arms;

wherein a PCB of each boom arm comprises a power hub electrically connected to the power source and to a corresponding subset of propellers of the boom arm, and a signal hub electrically connected to at least one processor of the processor module and to the corresponding subset of propellers;

wherein the power hub of each PCB comprises a plurality of selector switches corresponding to each of the corresponding subset of propellers, wherein the power hub of each PCB is configured to transfer power from the power source to the corresponding subset of propellers when the selector switches are in an engaged state, and wherein the signal hub of each PCB is configured to transfer signals from the processor module to the corresponding subset of propellers, wherein the processor module controls the plurality of propellers.

14. The electrical system of a UAV of claim 13, further comprising a sensor module comprising at least one sensor, wherein the sensor module is electrically connected to the processor module, and wherein the signal hub of each PCB is configured to transfer signals from the processor module to the corresponding propellers, wherein the processor module controls the plurality of propellers based at least in part on sensor data of the sensor module.

15. The electrical system of a UAV of claim 13, wherein the processor module comprises a central processor and a plurality processors associated with the PCBs, wherein the central processor serves as a central processing unit of a controller area network (CAN) bus, each PCB serves as a CAN node of the CAN bus, and each processor associated with a PCB serves as a CAN controller and transceiver of the associated CAN node.

16. An electrical system within a wing of a UAV comprising:

a power source;

a processor module comprising one or more processors; and

a plurality of printed circuit boards (PCBs);

wherein the plurality of PCBs each comprise a power hub electrically connected to the power source and to a plurality of propellers, and a signal hub electrically connected at least one processor of the processor module and to the plurality of propellers;

wherein the power hub of each PCB comprises a plurality of selector switches corresponding to each of the plurality of propellers, wherein the power hub of each PCB is configured to transfer power from the power source to the plurality of propellers when the selector switches are in an engaged state, and wherein the signal hub of each PCB is configured to transfer signals from the processor module to the plurality of propellers associated with the PCB, wherein the processor module controls the plurality of propellers.

17. The electrical system within a wing of a UAV of claim 16, further comprising a sensor module comprising at least one sensor, wherein the sensor module is electrically connected to the processor module, and wherein the signal hub of each PCB is configured to transfer signals from the processor module to the propellers associated with the PCB, wherein the processor module controls the plurality of propellers based at least in part on sensor data of the sensor module.

18. The electrical system within a wing of a UAV of claim 16, wherein the PCBs are incorporated into the wing during an injection molding process of the wing.

19. The electrical system within a wing of a UAV of claim 16, wherein the plurality of PCBs are connected to the plurality of propellers via electrical leads of a plurality of boom arms of a UAV.

20. The electrical system within a wing of a UAV of claim 16, further comprising a plurality of propellers of the wing, wherein the plurality of propellers of the wing are controllable by the processor module.