a single airbag to cover an upper portion having sharp and other components that pose safety hazards. In addition, more than two airbags may be used to cover a UAV apparatus **102**. For example, a large UAV **102** may have many components that necessitate use of more than two airbags.

**[0030]** In one implementation, the airbags **302** and **304** are sealed. In other words, the airbags **302** and **304** do not release air upon impact unless there are punctures of the airbags **302** and **304**. In another implementation, the airbags **302** and **304** have vents that release air from the airbags **302** and **304** upon impact. The release of air upon impact helps further reduce forces resulting from impact.

**[0031]** FIG. **4** illustrates the internal components of the control device **201** illustrated in FIGS. **2**A, **2**B, and **2**C. The electronic control device **201** comprises a processor **401**, a memory **402**, a sensor **403**, and an activator **404**. The sensor(s) **403**, e.g., accelerometer, altimeter, gyroscope, etc., provides data, e.g., an activation signal, to the processor **401** so that the processor **401** can determine if the UAV apparatus **102** has malfunctioned or otherwise experienced an event that warrants deploying airbags.

**[0032]** A variety of different sensors **403** can be used to trigger an activation signal, which removes power from the propulsion devices, e.g., propellers **203** and/or activates the electromechanical activator **404**. The sensors **403** can detect the malfunction based on simplified logic criteria, i.e., sense a flip, a broken propeller, bad battery, electronic health failure, communication failure, or software failure.

**[0033]** As an example, the sensor **403** is an accelerometer that provides acceleration data to the processor **401** for storage in the memory **402**. Alternatively, the acceleration data can be stored in one or more registers of the processor **401**. The processor **401** then determines that the UAV apparatus **102** is accelerating faster than a predetermined acceleration. The processor **401** then determines that airbags **302** and **304** illustrated in FIGS. **3**A and **3**B should be deployed. The processor **401** sends an activation signal to the electromechanical activator **404** instructing the electromechanical activator **404** to activate inflation devices **210** and **211**. The inflation devices **210** and **211** then deploy airbags **302** and **304** from the first storage device **207** and the second storage device **209**.

**[0034]** As another example, the sensor **403** is an altimeter that determines altitude data for the UAV apparatus **102**. The processor **401** then determines that the UAV apparatus **102** is flying at an altitude that is less than a predetermined altitude. The processor **401** then determines that airbags **302** and **304** illustrated in FIGS. **3**A and **3**B should be deployed.

**[0035]** As yet another example, the sensor **403** is a gyroscope that determines pitch, roll, and/or yaw data. The gyroscope provides that data to the processor **401**, which can determine if the UAV is performing any unexpected rotations. As an example, the gyroscope sends the processor **401** data that indicates that the UAV had a pitch and roll each greater than seventy degrees. The processor **401** determines that such a rotation is a flip that was unexpected.

**[0036]** As another example, the sensor **403** is a current sensing sensor that determines if a motor (not shown) is consuming current. If the sensor **403** determines that the motor is not consuming any current or is consuming an abnormally high amount of current, the sensor **403** provides that data to the processor **401**, which may determine that a motor failure has occurred.

**[0037]** The sensor **403** may also be a component sensor, i.e., a sensor that determines that a component has malfunctioned. For instance, the sensor **403** may determine that a propeller **203** is not functioning properly. The sensor **403** sends the data to the processor **401** so that the processor **401** can determine if airbag deployment is necessary based upon whether or not the sensor data is within an acceptable threshold or range. The sensor **403** can also determine if a communication failure has occurred with a particular component.

**[0038]** The processor **404** is not necessary for operation of the sensor **403**. For example, a component attached to the sensor **403** can be configured to operate only if the sensor **403** provides a signal having a value in a certain range. For instance, the inflation devices **210** and **211** illustrated in FIGS. **2**A, **2**B, and **2**C may be operably attached to a sensor that detects if the motor is not consuming any current or is consuming an abnormally high amount of current. The inflation devices **210** and **211** are configured to be activated to inflate airbags if the sensor **403** does not provide any signal indicating current consumption or provides a signal of an abnormally high level of current.

**1**. A unmanned aerial vehicle comprising:

a frame;

a propulsion mechanism coupled to the frame that propels the frame through the air;

one or more airbags coupled to the frame; and

an inflation device coupled to the frame and to at least one of the one or more airbags, wherein the inflation device inflates the one or more airbags based upon receipt of an activation signal such that the one or more airbags engulf the frame and the propulsion mechanism.

**2**. The unmanned aerial vehicle of claim **1**, wherein the inflation device comprises a canister of carbon dioxide having an electromechanical activator.

**3**. The unmanned aerial vehicle of claim **1**, wherein the one or more airbags have inflated dimensions such that the frame and the propulsion mechanism are engulfed after inflation of the one or more airbags.

**4**. The unmanned aerial vehicle of claim **1**, further comprising a sensor that detects a component malfunction and sends the activation signal to the inflation device upon the detection of the component malfunction.

**5**. The unmanned aerial vehicle of claim **1**, further comprising an altimeter producing an altitude signal; and

a processor coupled to receive the altitude signal, the processor executing code configured to determine whether the frame experiences a change in altitude, the processor sending the activation signal to the inflation device upon the processor determining that the frame is flying outside of an altitude range.

**6**. The unmanned aerial vehicle of claim **1**, further comprising an accelerometer producing an acceleration signal or loss of signal; and

a processor coupled to receive the acceleration signal, the processor executing code configured to determine whether the frame experiences a change in acceleration , the processor sending the activation signal to the inflation device upon the processor determining that the frame is accelerating at an acceleration in excess of a predetermined acceleration.

**7**. The unmanned aerial vehicle apparatus of claim **1**, further comprising a receiver that receives an instruction