| Component | Functional Purpose | Failure Mode | Failure Effect | Failure Cause | Previous Situation | | | | Assigned Action | Improved Situation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | S | L | D | RPN | | S | L | D | RPN |
| RC Transmitter | Communicate Commands from the RC Pilot to the RC Receiver | Hardware Failure* | Aircraft Loiters | Poorly connected circuit | 8 | 2 | 7 | 112 | | 8 | 2 | 3 | 48 |
| | | Transmits incorrect data | Crash | Settings incorrect | 9 | 2 | 6 | 108 | FFCL** | 9 | 1 | 4 | 36 |
| | | Loss of Connection | Aircraft Loiters | Settings incorrect | 8 | 6 | 8 | 384 | FFCL | 8 | 4 | 3 | 96 |
| | | | | Interference | 8 | 4 | 9 | 288 | FFCL | 8 | 4 | 3 | 96 |
| | | | | Transmitter battery dead | 8 | 6 | 3 | 144 | FFCL | 8 | 4 | 2 | 64 |
| Airspeed Sensor | Measure Va | Software Failure | Flight Less Smooth | Internal code | 4 | 1 | 10 | 40 | | 4 | 1 | 10 | 40 |
| | | Inaccurate Readings | Flight Less Smooth | Plugged pitot tube | 4 | 4 | 5 | 80 | | 4 | 4 | 5 | 80 |
| | | | | High angle of attack | 4 | 4 | 2 | 32 | | 4 | 4 | 2 | 32 |
| | | | | Incorrect mounting | 4 | 2 | 2 | 16 | | 4 | 2 | 2 | 16 |
| | | Hardware Failure | Flight Less Smooth | Poorly connected circuit | 4 | 1 | 7 | 28 | | 4 | 1 | 7 | 28 |
| GPS | Measure global position | Software Failure | Crash | Internal code | 9 | 3 | 10 | 270 | Extensive testing** | 9 | 3 | 3 | 81 |
| | | Inaccurate Readings | Crash | Interference | 9 | 4 | 5 | 180 | FFCL | 9 | 2 | 4 | 72 |
| | | Hardware Failure | Manual Landing | Poorly connected circuit | 6 | 1 | 7 | 42 | | 6 | 1 | 7 | 42 |
| Battery | Provide current to all systems in the air | Loss of Power | Crash | Battery not charged correctly | 9 | 5 | 3 | 135 | FFCL | 9 | 5 | 2 | 90 |
| | | | | Battery degradation | 9 | 1 | 1 | 9 | FFCL | 9 | 1 | 1 | 9 |
| Motors | Rotate Props | Overheat | Fire and Crash | Over stressing the motors | 10 | 3 | 5 | 150 | Add warning to FFCL | 10 | 2 | 5 | 100 |
| | | Does Not Transmit Torque | Glide to Landing | Props unsecured | 7 | 8 | 3 | 168 | FFCL | 7 | 5 | 2 | 70 |
| | | Rotates the Wrong Way | Mission Does Not Start | Wires connected backwards | 6 | 3 | 2 | 36 | FFCL | 6 | 1 | 2 | 12 |
| | | Hardware Failure | Glide to Landing | Poorly connected circuit | 7 | 1 | 7 | 49 | | 7 | 1 | 7 | 49 |
| Wiring | Transmit power and signals | Does Not Transmit Electricity | Crash | Wires connected to incorrect ports | 9 | 7 | 8 | 504 | FFCL | 9 | 3 | 3 | 81 |
| | | | Crash | Electrical short circuit | 9 | 3 | 8 | 216 | Shrink wrap all wires | 9 | 1 | 8 | 72 |
| | | | Crash | Electrical open circuit | 9 | 8 | 5 | 360 | FFCL | 9 | 8 | 1 | 72 |
| Airframe Body | Contain components, provide lift, provide stability, & respond to control inputs | Flight Characteristics Change | Crash | Icing | 9 | 2 | 1 | 18 | Only fly in good weather | 9 | 1 | 1 | 9 |
| | | | | Components move | 9 | 5 | 5 | 225 | Strap down components | 9 | 3 | 3 | 81 |
| | | Parts Break Off | Crash | Flight envelope exceeded | 9 | 2 | 3 | 54 | Train safety pilot | 9 | 2 | 2 | 36 |
| | | | | Poor manufacturing | 9 | 6 | 7 | 378 | Extensive testing | 9 | 6 | 2 | 108 |
| | | | | Part poorly attached | 9 | 2 | 7 | 126 | FFCL | 9 | 2 | 3 | 54 |
| | | | | Unidentified flying object impact | 9 | 1 | 3 | 27 | Train safety pilot | 9 | 1 | 3 | 27 |
| WiFi Light Beam | Transmit data between WiFi router and the WiFi receiver | Loss of Connection | Manual Landing | Interference | 6 | 8 | 7 | 336 | FFCL | 6 | 3 | 6 | 108 |
| | | | | Antenna not pointed correctly | 6 | 10 | 3 | 180 | Assign antenna pointer | 6 | 3 | 3 | 54 |
| | | Hardware Failure | Manual Landing | Poorly connected circuit | 6 | 1 | 7 | 42 | | 6 | 1 | 7 | 42 |
| | | Software Failure | Manual Landing | Internal code | 6 | 1 | 10 | 60 | | 6 | 1 | 10 | 60 |
| Human Operators | Give high level commands & ensure safety of flight | Sick | Mission Does Not Start | Bacteria or viruses | 5 | 4 | 3 | 60 | | 5 | 4 | 3 | 60 |
| | | Can Not Attend | Mission Does Not Start | Other plans | 5 | 1 | 1 | 5 | | 5 | 1 | 1 | 5 |
| | | Sends Incorrect Commands | Crash | Poor judgement | 9 | 2 | 9 | 162 | Extensive practice | 9 | 1 | 9 | 81 |
| | | | Crash | Poor understanding of system | 9 | 2 | 5 | 90 | Extensive practice | 9 | 1 | 5 | 45 |

* "Hardware Failure" refers only to electrical hardware (e.g. USB port breaks)

** FFCL is the Field Flight Checklist to which we add items to test and do before flight

*** Extensive testing before use refers to extensive flight tests before the competition. We currently perform flight tests a couple times a week.

S: Severity of failure effect

L: Likelihood of failure occurring

D: Detectability of cause before failure occurs

RPN: Risk Priority number (S*L*D)