1) Team skills analysis:

A major weakness in our group is by “design”, none of us are very well at programming and using microprocessors. This is because our Project **does not** need this skill, as it is a requirement to not use programable chips. Our group does lack a little in project management, engineering development, and research. However, we would all like to improve our engineering development and most of us would like to improve our research and project management.

When it comes to our strengths, we are very good at the electrical side of things, and we are interested to learn more. We have a lot of experience with oscilloscope, Breadboard, and soldering among others equipment, but we do need some help using other equipment like for PCB design and manufacturing. This will be an enjoyable learning curve for all of us as we all really wish to learn PCB design and manufacturing.

2-4 paragraphs identifying team strengths/weaknesses and overall team skills impact to project execution;

2) Legal and Ethical analysis:

Our Project will be Installed on a plane making a lot of regulation come into play. For our project will shall avoid programmable chips, like microprocessors as they have extra regulations added on top (DO-178 DO-254). This project will have some DO-160G regulations in place. The DO-160G documentation, and regulation and method of testing is available at RTCA website, but it costs around $500. Textron will provide a copy of sections we need free of charge.

The ethics of this project is rather simple. As we are told what exactly to make, a fan monitor, we have an obligation to engineer the fan monitor **as asked**. However, we also have an obligation to ensure what is asked makes ethical sense, which it does, and to ensure if any failure occur in the device, it does not cause more issues. One design criterion we have is to ground undesired output and high impedance desired output. This is to ensure if a fault happen with the device it would go to ground causes no more issues. While misuse is a possible outcome, its highly unlikely as this device will be handled by **other engineers** with a detailed explanation on how this device works.

2-4 paragraphs identifying legal and ethical concerns for the project use or misuse, that will require additional requirements be included in the design

3) Milestones:

- Weeks 1-2: we will research on initial details like BLDC motors, DO-160G regulations.
- Weeks 3-4: More research but now more focused on circuit. We will research:
    - 1. Voltage Regulator
    - 2. Voltage "step down" but for DC
    - 3. Capacitor filter
    - 4. Op amps
    - 5. Hysteresis effect

- Week 5-6: We will be Narrowing down specific components/element and start beginning on initial circuit. We will be testing it in software.
- Week 7-8: We will continue working on initial large circuit and complete it. We will also be testing this circuit.
- Week 9-10: We would have completed first large prototype. This is buffer space if extra time is needed for this prototype. If not, begin designing a smaller prototype.
- Week 10-12 We will begin designing a smaller prototype. We will be testing it in software first.

• **Date**	• **Objective**
• 10/1	• Initial research
• 10/22	• Simulation prototype complete
• 10/29	• Initial large working prototype built
• 11/5	• Second prototype simulated that will be more compact
• Winter break	• ----------

2-4 paragraphs identifying major project milestones or key deliverables that will need to be in place at specific tim es;

4) Metrics: 2-4:

paragraphs describing the metrics used to track project performance to identified milestones;

5) Acquisition Schedule:

2-4 paragraphs describing the project architecture, associated conceptual bill of materials (BOM), acquisition schedule for project components, and project risks of late delivery of resources;

6) Data Configuration Management Plan:

2-4 paragraphs describing the configuration management methodology for software, hardware, and documentation;

7) Software Development Model:

Modeling software as not yet been selected by team. Currently we have the following options: Multisim, MATLAB Simulink, and LTspice, which is what Textron uses. These modeling softwares will be rather important as they will reduce the number of prototypes we would have to make.

PCB design software will be needed as one of the deliverables to Textron is a PCB design file. We shall use Circuitmaker, a free software based on Altium which is used at Textron.

2-4 paragraphs describing software development model chosen by the team (Agile, Iterative, Waterfall, V, etc.) and why this model was selected.

8) Overall First Semester Schedule:

Our first semester will be based on the mostly research and building of the first prototype. We have almost completed our initial research phase and plan to begin looking into circuity in the following weeks. After all research is done, we plan to build at least one working prototype that will be larger than the required size. If time permits, we will also build our first small circuit.

Next semester will be to reduce size and improve protection to follow DO-160G regulations. Textron will do all the testing necessary for our devices if needed.

2-4 paragraphs depicting when systems integration and systems testing will take place.