



**Project Name: Textron Aviation
Cooling Fan Circuit**

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Senior Design EE 585

INTRODUCTION

This project is to develop a small circuit board that will monitor the tachometer output of a brushless DC cooling fan, and then control a discrete (ground/open) output to indicate if the cooling fan is functioning as intended. The intent is for the circuit board to be small enough that it can be installed in the aircraft wire bundle with zip ties to support aftermarket and late point definition installations with minimal impact to the aircraft and/or maintenance crew. Everyone I have interviewed are all Professors at WSU (and a PhD student who also teaches).

BODY

Interview 1: Dr. Stallard

The main takeaway from the interview with professor Stallard was to look into frequency to voltage converters, Snubbers/MOVs and a FAA regulation on the housing for our circuit. Dr. Stallard answer all the questions on the interview very clearly.

Interview 2: Professor Arun

The interview with Professor Arun allowed me to ask about Snubbers, which seem very good to be added for our bus input. I still must investigate both Snubbers MOV's as well and compare the two. Arun also said we should label the housing.

Interview 3: Dr. Tamtam

Dr. Tamtam gave me a equation for a DCBL motor speed related to voltage. Dr. Tamtam also showed explained why with this equation you can get many errors and why it would be best to stick with the tachometer input instead of fan voltage input. (if the fan is forceable stopped i.e. something fell between blades, the voltage does change, even if fan speed goes down). Dr. Tamtam also suggested a capacitor for our bus input. Looking in MOV and Snubbers, both seemed to have a capacitor (MOV seemed to be a capacitor? But I would have to investigate this more to confirm, I've only done a quick google screech so far on them). All professors said similar things, but Dr. Tamtam showed an equation for it which helped me understand it very well.

Interview 4: Dr. Zewde

Dr. Zewde agreed with what other professors have told me so far.

Conclusion

This Interview processes was very helpful for me. I learned a lot and I learned that asking others who know a lot is very educational. I learned that every Engineer starts like any other, but all slowly develop a lot of knowledge due to the lifetime commitment of engineers to continuous learning. If engineers did not try to learn about different components and different circuits then they could not solve there newer problems. Sometimes engineers need to learn about more simple stuff, like what the customer wants with a interview focused for them.