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Title of Project: 100W Low Voltage AC-DC Converter

Problem Statement: Design a AC-DC converter with a 115Vac, 400Hz, voltage input that's capable of providing up to 100W to a 28Vdc output. This will require both AC rectification and DC step down in the form of a buck converter. Since all team members are working professionals in the aerospace industry, instead of FCC or CISPR requirements, we will be designing around DO-160G EMI requirements, including CONDUCTED emissions and susceptibility requirements as well as lightning survivability.

Objectives:

- Learn to design AC and DC EMI filters to aerospace standards
- Understand basic power electronics concepts such as power conversion and switching power supplies
- Design hardware with consideration of both conducted emissions and susceptibility requirements as well as lightning requirements
- (Nice to have) Create a basic bill of materials for the design and understand real-world design constraints including material cost and physical sizing

Project Timelines:
PROJECT DUE DATE: Jun 2, 2025 at 8pm
PRESENTATION DUE DATE: Jun 4, 2025 at 6pm

- Finalized LTSpice model of Low Voltage AC-DC Converter
  - Power Path (5/18)
  - AC EMI Filter (5/24)
  - DC EMI Filter (5/24)
- Python Modelling (5/30)
  - Get rough estimations on switching noise from the power path
  - Take the transfer function from the filter
  - Use that function and estimations in synthesis and calculate conducted emissions/susceptibility
- Report Generation (6/1)

- Presentation Slides (6/1)

Stretch Goals:

- Board layout
- Map bill of materials to board layout