

## Buck Converter Project

There have been several homework assignments working on the Buck Converter, but those don't work with the actual hardware. This document's purpose is to get you going on the hardware, where the "rubber meets the road."

### Goals:

The goals of this project are learning. We want to actually use the things we did in homework to control the Hover Copter. The PCB will allow you to do both converters (with and without the output capacitor). Just solder the positive terminal of the capacitor to the square surface mount pad instead of putting it through the hole. This way you can investigate both.

### Milestones:

Here are some milestones you need to meet. More information will be provided in class near the time you need it to achieve these milestones.

Milestone	Deliverable	Due Date
Software for data communication/debugging	Code, documentation & screenshots	4/16/2021
Bring-up plan (hardware & software)	Written test plan	4/21/2021
Build up PCB	Photos of mechanism and PCB	4/26/2021
Test hardware	Results of your tests	4/28/2021
LTspice simulation & characterization of <a href="#">inductor</a>	Documentation on tests and results	4/30/2021
Models for Discontinuous Conduction Mode	“	5/4/2021
Apply state feedback, “hand placing” poles	Code, documentation & videos	5/7/2021
Place poles using LQR	Documentation & videos	5/12/2021
Full Order Observer (in tandem with measurements)	Code, documentation & videos	5/17/2021
Reduced Order Observer	“	5/21/2021
Kalman Full Order Observer	“	5/26/2021
Final Documentation	“	6/2/2021

### Hints:

Professor Kat Kim has some very nice [tutorial videos](#) which I strongly suggest you watch carefully. Software to get data from the Arduino Nano to your computer is provided by a student at MIT is what I suggest you use for your [communications/debugging software](#). The Arduino IDE also has a [plotter](#) you could use if you don't like my recommendation. The Kicad design files for this project are on my [web site](#).