

Fender 5F2-A Princeton Amp Project

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Physics 398 EMI

My physics 398 semester project was to build a guitar amplifier. I chose to do this because I wished to learn more about guitar amplifiers, and it seemed the easiest way would be to build one. I also chose to build an amplifier because I happened to not own a guitar amplifier at the time, and I thought that this would be an interesting way to rectify that problem. The process I went through to build this still in progress amplifier will be described here.

My original plan was to build an amp very similar to Bill Paine's "Chimp Amp" from Spring 2001, which was a Fender Champ Amp in a Gorilla amp cabinet. The difference was that I was going to build my amp based on a modified Fender Princeton 5F2-A design. I chose this path because the old amplifier cabinet I had gotten from ebay was too small to try anything else. However, after considering the matter for a bit, Professor Errede thought the cabinet was too small to attempt a "Chimp Amp." So I scrapped the Gorilla cabinet part, but still stuck with my designs for the amplifier.

My designs were not quite the same as the Princeton 5F2-A design, since mine was modified to account for a smaller amount of cabinet space. The 5Y3GT tube was replaced by 4 high voltage diodes, and one input jack was removed. Everything else followed the 5F2-A design though. I gathered the chassis and some components from Professor Errede's lab, and the rest of the components I got from a couple different websites or Radio Shack. A couple of problems occurred from my purchasing components from the Internet. The first problem was that it took over three weeks for

one company to ship me the power transformer and output transformer I ordered, and on a sidenote I received no discount for all the shipping problems I had. And the other problem was that the output transformer I finally received turned out to be the wrong transformer, though this may have been due to miscommunication more than anything else. So I am now extremely wary of ordering any other crucial parts needed to complete a semester long project from a website that can't even design it's own order form properly.

After gathering all the parts, I, along with Professor Errede and our TA Dan, drilled the appropriate holes in my chassis and I assembled the circuit and wired together everything needed to set up my chassis. A few problems occurred here as well. One problem was that I ended up with 3 extra wires from my transformers, due to me removing one tube from the design and using the wrong output transformer. Another problem is that space became very limited in my chassis, which I did not expect to happen. The last and biggest problem occurred due to the fact that I had never built anything involving a circuit before, and the amplifier circuit I had wired turned out to be very dangerous. However Professor Errede helped me fix these problems and turn my project into a working amplifier. Everything else seemed to be fine, and the amplifier performs like it.

In the future I plan to build a cabinet for this amplifier and install a speaker for it, preferably a speaker of size 12 inches or larger. But for now I will settle for just having the heart of the amplifier constructed. All in all it was a great experience working on this project, and I am glad to have gotten this chance. And if I was pressed to say what was the biggest thing I learned from working on this project, it is that I should stop attempting

to solder after staying up for the previous 23 hours studying for a test for a different physics class. I would like to thank Steve Errede and Dan Finkenstadt for all their help on my project.