Sprint 1 – power supply

The power supply on the extension board we got from the last project team isn’t working so we have to try to find the error and a solution.

At first we took a look on the EAGLE ® formatted plan of the circuit. It seems to be ok but we decided to generate a new one with a web app by Texas Instruments ® called WEBENCH® System Power Architect to compare them. We used the tool and generated a new circuit plan with the following input parameters:

* V\_in\_max : 25 V
* V\_in\_min : 13 V
* V\_out : 12 V
* I\_out : 5 A

These parameters are given by the maximum and minimum output of the used accumulators (V\_in) we use in the XCopter and the SoC-Board restrictions which are 12V input voltage and 3.5A output current. We added another 1.5A for provision.

After that, we compared our new plan with the plan, the last project used. We figured out that they are the same so there cannot be the problem.

The next step was to compare all the components and the voltage control IC. There we saw that the last group, which designed and populated two circuit boards, used different ICs on each of them. So at least one of the boards cannot work. They also told us that when they tried to figure out the error, they probably destroyed some parts.

Big error sources are the SMD parts. The problem with them is that they aren’t easily testable. Therefor we bought all the parts in DIP norm and built the circuit on a plugboard to test if the circuit could work in general. The voltage control IC wasn’t available in DIP norm so we mounted it on an adapter to use it on the plug board.

After populating the board we tested it with a configurable power supply where we simulated the accumulators. No matter what we changed on the board, the output voltage dropped all the time and wasn’t stable at all. After a discussion on an electronics forum and Mr. Steiper, we found out that it’s not possible to build a stable power supply with our available methods and parts because of the oscillating circuits that the capacitators and coils generate.

Because all this cost a lot of time and our missing experience and tools in this subject, we decided to buy a ready-made power supply from an online shop.

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