

# Designer Needs to Learn More. Where?

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Hi all,

I am a part time contract PCB designer. Not some giant corporation, just one guy doing boards when he can :-). Been at it for a long time, but I am not learning new skills, and so I am falling behind on multilayer design, as in 8+ layers with numerous split planes, as well as balanced lines and controlled impedance, routing BGA's and a handful of other things that a lot of high end manufacturers of course, require. I know of these things, as I was a hardware engineer early on in my career, but I am finding that I loose opportunities because in real life, I have not had much experience doing layouts with such requirements, and I am not one to try and "fake" my way into a contract, or any kind of job. Truth is, most of my layouts are 4 layers, two of which are ground and power.

I am wondering if anyone might have some pointers, faqs, book recommendations or whatever that might help me learn some of these skills that I have fallen behind on. Questions I get asked about controlled impedance, RF clock line layouts and distributions, along with the idea of multiple, split planes, cost me opportunities, because I am not much for lying and getting in over my head :-)

This is not a full time job, but I would like to find such employment, and without the above capabilities, I do not qualify for such opportunities. I don't see these things as all that difficult to comprehend, as I do know why we need split planes and controlled impedance, etc, but when asked how I approach such things, I really don't have an answer, having not ever done it or learned the basics of how to go about it.

Have you done controlled impedance, using split planes?  
How do you decide what the layer stackup needs to be?  
How do you route very high speed clock lines to multiple loads across the board?  
How do you keep emissions and cross-talk below Part 15 requirements.

As you can tell, I am just a generic designer, and I want to get better, so I can do more work, and maybe go full time one day.

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I would appreciate any thoughts, input, suggestions, or references that I might search to sort of "self teach" myself more of these skills. My public library is empty when it comes to such topics, and although I see a lot of books being published, I would not know a good one from a poor one and so maybe someone can recommend one or two?

Hope this is a reasonable question. I find so many people who know so much, but I have not kept up and as is obvious, I am in need of information and skills if I am to continue to do this, even part time.

Much obliged for any input.

Thank a lot,

Mark

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