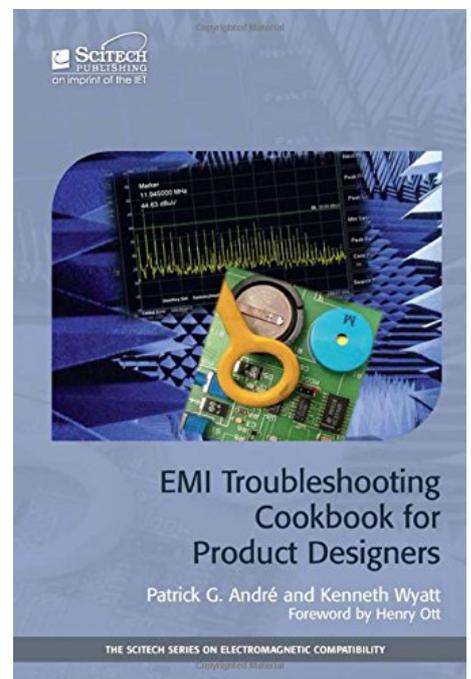




[Get this book, fix EMI problems](#)

[Martin Rowe](#) - January 06, 2015

[EMI Troubleshooting Cookbook for Product Designers](#) by Patrick G. André and Kenneth Wyatt.
Scitech Publishing, 2014.



Having recently reviewed two other books on EMI/EMC, I can safely say that *EMI Troubleshooting Cookbook for Product Designers* is the most practical of the trio. In this book's 234 pages, you'll find a wealth of tips and tricks for getting your product to pass EMC compliance tests for both emissions and immunity.

André and Wyatt, both EMC consultants, have compiled a book that cuts through the electromagnetic theory and gets to the heart of the matter: fixing EMI problems. If you want more theory, then get copies of the books the authors use as references, which will complement this book very well.

The authors open with three relatively short chapters covering EMI basics and instrumentation. They stick to concepts, leaving the equations for the appendices for other books. I like the fact that they explain detectors—peak, quasi-peak, and average—in spectrum analyzers and EMI receivers. Other books might skip that.

André and Wyatt explain why problems occur, in part because digital designers think in terms of voltage rather than current. They follow up by telling you how PCB designers tend to focus on signal

and power paths but not necessarily on return paths.

The remaining chapters discuss the kind of tests your product needs to pass to meet regulations: Radiated and conducted emissions, radiated and conducted immunity, ESD, and others. In each case, they use a consistent style. For example, each chapter discusses what troubleshooting techniques to use in the test lab and what you can do at your facility. They not only discuss techniques such as how to eliminate variables such as ambient emissions, they show you the tools you need. In some cases, the tools are everyday items such as TV antennas for measuring emissions and barbeque lighters for generating ESD. You'll also learn how to turn RCA-style connectors into E-field probes. You'll learn how to make and use current probes to find emissions and susceptibility problems in cables. The book even mentions the use of nonconducting crochet hooks to move cables inside enclosures. Every chapter has a "DIY Tricks and Low-Cost Tools" section that contains perhaps the most important "take home" lessons.



A log-periodic antenna made from a PCB, one of many tools you should have in your EMI troubleshooting inventory.

The authors emphasize the use of EMI filters as a way to block high frequencies from coupling onto cables that can radiate. There's a photo that shows how bundling wires together to make them neat rendered a filter virtually useless. Why? Because the wires on both sides of the filter were bundled together; noise from input wires can couple directly to output wires, bypassing the filter.

The authors spend some pages on filter design, but in an appendix. Placing such information in an appendix rather than in a chapter means it won't slow you down. Other authors might not do that. After all, the point of this book is to show you how to pass tests now; not necessarily to design a filter if you don't have to.

André and Wyatt don't spare the figures in their book. You'll get diagrams that explain how problems occur and how to set up a test table for troubleshooting. Schematics throughout the book help you see why problems occur. You also get photos of the tools you should have on hand and in some cases, how to make your own tools.

Some of the photos and diagrams in this book also appear here on EDN. Yes, you can get some of the information in this book from Wyatt's [The EMC Blog](#), but this book pulls it all together in one place. Wyatt's blog also complements the book by providing hands-on reviews of some test equipment such as spectrum analyzers.

EMI Troubleshooting Cookbook for Product Designers is one book you should have on hand before EMI problems occur. To learn about how to minimize EMI problems during design, refer to the book's references or to [Controlling Radiated Emissions by Design](#).

Kenneth Wyatt will present many of the concepts in this book in a three-hour seminar, [My Product Failed EMI - Now What Do I Do?](#) at DesignCon 2015.

Also see

[EMC book needs some serious editing](#)

[Book review: Controlling Radiated Emissions by Design](#)

[The EMC Blog](#)

—Martin Rowe, Senior Technical Editor 



Want to learn more? Register now for [DesignCon](#), the premier conference for chip, board, and systems design engineers. Taking place January 27-30 at the Santa Clara Convention Center, DesignCon 2015 will feature technical paper sessions, tutorials, industry panels, product demos, and exhibits.

DesignCon is managed by UBM, EDN's parent company. Get updates on [Twitter](#), [Facebook](#), & [DesignCon Central](#).
