

# Preface

A search for ‘Software Defined Radio’ on Amazon.com at the end of 2010 shows that almost 50 books have been written on the subject. The earliest book was published in 2000 and a steady stream of new titles has been coming out since. So why do I think that yet another book is warranted?

SDR is now a mature field, but most books on the subject treat it as a new technology and approach SDR from a theoretical perspective. This book brings SDR down to earth by taking a very practical approach. The target audience is practicing engineers and graduate students using SDR as a tool rather than an end unto itself, as well as technical managers overseeing development of SDR. In general, SDR is a very practical field—there just isn’t very much theory that is unique to flexible radios versus single function radios.<sup>1</sup> However, the devil is in the details... a designer of an SDR is faced with a myriad of choices and tradeoffs and may not be aware of many of them. In this book I cover, at least superficially, most of these choices. Entire books can be devoted to subjects treated in a few paragraphs<sup>2</sup> below (e.g. wideband antennas). This book is written to be consulted at the start of an SDR development project to help the designers pin down the hardware architecture. Most of the architectures described below are based on actual radios developed by the author and his colleagues. Having built, debugged, and tested the different radios; I will highlight some of the non-obvious pitfalls and hopefully save the reader countless hours. One of my primary job responsibilities is oversight of SDR development by many government contractors. The lessons learned from dozens of successful and less than successful projects are sprinkled throughout this book, mostly in the footnotes.

Not every section of this book addresses SDR specifically. The sections on design flow and hardware architectures are equally applicable to many other digital designs. This book is meant to be at least somewhat standalone since a

---

<sup>1</sup> Cognitive radio, which is based on flexible radio technology, does have a significant theoretical foundation.

<sup>2</sup> The reader is encouraged to consult fundamental texts referenced throughout.

practicing engineer may not have access to, or the time to read, a shelf full of communications theory books. I will therefore guide the reader through a whirlwind tour of wireless communications in Appendix A.<sup>3</sup> The necessarily superficial overview is not meant to replace a good book on communications [1,2] and the reader is assumed to be familiar with the subject.

The author does not endorse any products mentioned in the book.

---

<sup>3</sup> The reader is encouraged to at least skim through it to become familiar with terminology and nomenclature used in this book.



<http://www.springer.com/978-1-4419-9331-1>

Implementing Software Defined Radio

Grayver, E.

2013, XVIII, 270 p., Hardcover

ISBN: 978-1-4419-9331-1