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# BasicSynth



## Synopsis

Books on music synthesizers explain the theory of music synthesis, or show you how to use an existing synthesizer, but don't cover the practical details of constructing a custom software synthesizer. Likewise, books on digital signal processing describe sound generation in terms of complex equations and leave it up to the reader to solve the practical problems of programming the equations. BasicSynth takes you beyond the theory and shows you how to create a custom synthesizer in software using the C++ programming language. The first part of the book explains the basic computer algorithms used to generate and process sound. Subsequent chapters explain instrument design using actual synthesis instruments. The example instruments are then combined with a text-based scoring system and sequencer to produce a complete working synthesizer. Complete source code to the C++ classes and example programs is available for download from the Internet.

## Book Information

Paperback: 288 pages

Publisher: Lulu.com; 1st edition (October 25, 2008)

Language: English

ISBN-10: 0557022126

ISBN-13: 978-0557022120

Product Dimensions: 6 x 0.7 x 9 inches

Shipping Weight: 1.1 pounds (View shipping rates and policies)

Average Customer Review: 4.0 out of 5 stars 8 customer reviews

Best Sellers Rank: #559,824 in Books (See Top 100 in Books) #83 in Books > Arts & Photography > Music > Theory, Composition & Performance > MIDI, Mixers, etc. #21832 in Books > Computers & Technology

## Customer Reviews

I purchased this book on a lark and I have to say I am pretty happy with it. I am primarily interested in putting soft synths on micro controller, and this book does not really cater to that particular goal, but it does provide a good starting point. The book is not heavy in theory, but it was not intended to be. It provides a very practical approach to the subject and if you download the code and study that along with the book, you will receive an introductory education to writing software synthesizers. Be warned. There is no real code in the book. The only way to see the code is to actually download from the internet.

This is a wonderful little book that provides good coverage of digital synthesis techniques including oscillators, filters, envelopes, etc. The author does a great job of introducing concepts and relating the topics to computer code. Some readers might want more theoretical depth but that would be missing the point of the book which is to provide a comprehensive but gentle introduction to coding a "BasicSynth." I also appreciate the way the author relates mathematical concepts to computer code. I recommend the book to anyone who is interested in exploring the code and concepts that are used to create digital synthesizers.

I don't normally write reviews for products I buy but I thought that I would put in my two cents about the book *Basicsynth*. I started studying the beginnings of digital signal processing (DSP) because I was fascinated with the idea of constructing a software instrument, yet every book on DSP was either a lot of technical jargon or made you say "Okay, so how do I use this practically?" Similarly, those of us who aren't the best at translating real life equations into code will find most books on programming to be equally unhelpful. This book is that intermediary that bridges the gap between digital signal processing and computer programming, and it does a fine job of it. I have not used the book to its full potential, since I'm still a novice with both the equations and concepts of actual DSP as well as programming. However it has helped tremendously to understand some of the basic concepts of DSP without unnecessary jargon as well as given me a clearer look into how a computer program actually represents some of the seemingly complex equations. The later chapters can get extremely complex in subject, but keep in mind this book is not meant as a replacement for DSP books, but rather a supplement. For a good place to start I recommend Richard G. Lyons "Understanding Digital Signal Processing". One of the really great aspects of the book is that the code is presented in a very clear fashion such that it is easy to identify what the functions in the excerpts are doing. Not only that but frequently Mitchell provides example code that is a literal representation of the equation, followed often by multiple versions of that same code in some simplified fashion. This can either be code that is more computationally efficient or other times it's just presented in a way that's easier to read and understand for the would-be programmer. Since programs are not always written with diligent attention to useful comments and formatting, browsing existing code may not be that helpful. As the other review by Dan Mitchell explains, the book covers many topics including the most common forms of computer generated sound, including FM, subtractive and additive synthesis, as well as filters and common processors like reverb and chorus. There are numerous other topics in the book that are definitely worth your while if the subject matter

interests you. My solitary complaint about the book is that it is currently only fully available in print format. While there is nothing inherently wrong with that, for a field that is as fast moving as programming software instruments and effects, it is helpful to be able to update code and concepts if necessary. In defense of the book however, most changes in C++ are minor at this point and unlikely to affect the content of the book and second the subjects the book covers are well-trodden and "old" enough that new innovations in the field will also have little or no effect on what are tried and true methods of sound synthesis. All in all a fantastic book and make sure to get the example code at [...] when working with the book.

This is a fun book to go through. You'll want to reference the code while you read this.

Great book for reference if you're interested in building synths!

I've been writing a software synthesizer myself and had been hunting around for books to cover some of the theory and ideas for implementation. This book is fantastic in that regard. It explains pretty much everything needed in order to design and develop your own software synthesizer and has proved to be invaluable to me so far. The concepts are explained clearly and anyone with even a basic grasp of the principles of sound generation should find it very useful. If you're looking to create your own software synthesizer or are just interested in how a software synth works, give this a shot, I cannot recommend this book highly enough.

Unless you love reading about equations pertaining to synth I wouldn't recommend this book. The author zeros in on the math that makes up parts of a synth and includes some code, but it's the dryest presentation ever. Also there is no big picture discussion on how to try in the parts. Don't buy this book

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covered, including oscillators, envelope generators, mixers, filters, delay lines, reverb and flangers. Working examples of MIDI and non-MIDI sequencers are also included. Subsequent chapters explain instrument design by constructing actual synthesis instruments. Each instrument covers a different synthesis technique, including additive, subtractive, and FM synthesis as well as sample file playback. The example instruments are then combined with a text-based music scoring system to produce a complete working synthesizer. Complete source code to the C++ classes and example programs is available for download from the Internet.

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