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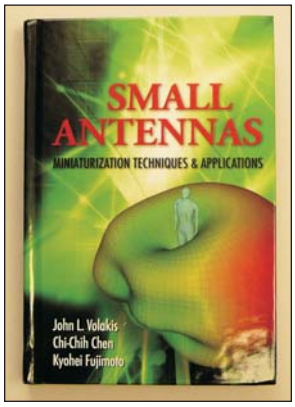
DESIGN NOTES

Two New Books for Engineers

Small Antennas: Miniaturization Techniques & Applications
John Volakis, Chi-Chih Chen, Kyohei Fujimoto
McGraw Hill (www.mhprofessional.com)
Hardback: ISBN: 978-0-07-162553-1, $99.95



This book provides a comprehensive look at "making antennas smaller." It begins with an excellent review of small antenna theory and past practice, starting with the work of Wheeler, Chu and Harrington between 1947-1960, then presenting examples of additional engineering work from that time through the late 1900s, and to the present day.

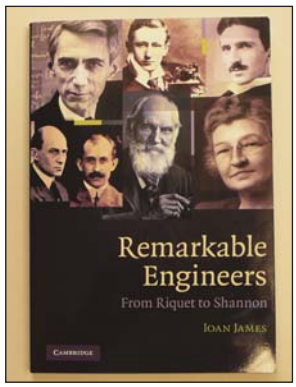
Ch 1 *Survey of Small Antennas*
Ch 2 *Fundamental Limits and Design Guidelines for Miniaturizing Ultra-Wideband Antennas*
Ch 3 *Overview of Small Antenna Designs*
Ch 4 *Antenna Miniaturization via Slow Waves*
Ch 5 *Spiral Antenna Miniaturization*
Ch 6 *Negative Refraction Index Metamaterial and Electromagnetic Band Gap Based Antennas*
Ch 7 *Antenna Miniaturization Using Magnetic Photonic and Degenerate Band Edge Crystals*
Ch 8 *Impedance Matching for Small Antennas Including Passive and Active Circuits*
Ch 9 *Antennas for RFID Systems*

Ultimately, this book is intended to be practical, helping engineers design and build reduced-size antennas for many applications. In particular, Chapter 3, "Overview of Small Antenna Designs," provides a starting point for visualizing a new design. In their Acknowledgements, the authors give glowing praise to Prof. Yunqui Fu, calling his contributions to that chapter, "a herioc effort," which, "should serve the antenna community for years to come." This chapter includes a listing of 189 references!

As you can see in the chapter summary above, the authors also include the latest developments, such as metamaterials and electromagnetic band gap structures (Ch. 6). These physical structures are extended to molecular behaviors in Chapter 7's magnetic photonic crystals (MPC) and degenerate band edge (DBE) crystals. The ability of these structures and materials to decouple antennas from the surrounding environment enables unique designs to be implemented with enhanced radiation pattern performance and stable feedpoint impedance.

The authors are to be commended for assembling an up-to-date text on an important topic for the development of wireless technology.

Remarkable Engineers: From Riquet to Shannon
Ioan James
Cambridge University Press (www.cambridge.org)
Hardback: ISBN 978-0-521-51621-1, $85.00
Paperback: ISBN 978-0-521-73165-2, $34.99



Here is fun book for engineers to read (or anyone with an interest in the history of technology). In a short 200-page book, 50 engineers are profiled. While the author could have included many others, he succeeded in presenting a mix of well-known and more obscure personalities.

The book begins with Pierre-Paul Riquet (1604-1680), who oversaw the building of the Grand Canal de Languedoc, and ends with Claude Shannon (1916-2001), who made the remarkable revelation of separating information from the medium that carried it, and developed the mathematical basis for modern communications.

In between are such luminaries as Charles Babbage, Lord Kelvin, Gustav Eiffel, Thomas Edison, Rudolf Diesel, Nikola Tesla and William Shockley.

Also interesting are some less well known engineers that the author selected—William Henry (design principles of electromagnets and electrical machinery), Ferdinand Braun (the oscilloscope, rectifiers and resonant antennas), Hertha Ayrton (the electric arc and air flow analysis), Frederick Lanchester (gas and petrol engines), Peter Akimovich Pal'chinskii (national industrial policies and operational efficiency), Edith Clarke (long distance power lines, time-saving charts and calculating devices), and Vladimir Kosam Zworkin (photocells, facsimile machine, television camera tube).

The short biographies are straightforward and factual—efficient, like an engineer would do it! The overall result is a timeline of technology development, and an appreciation for those who made it happen.