

Radio Antenna Engineering

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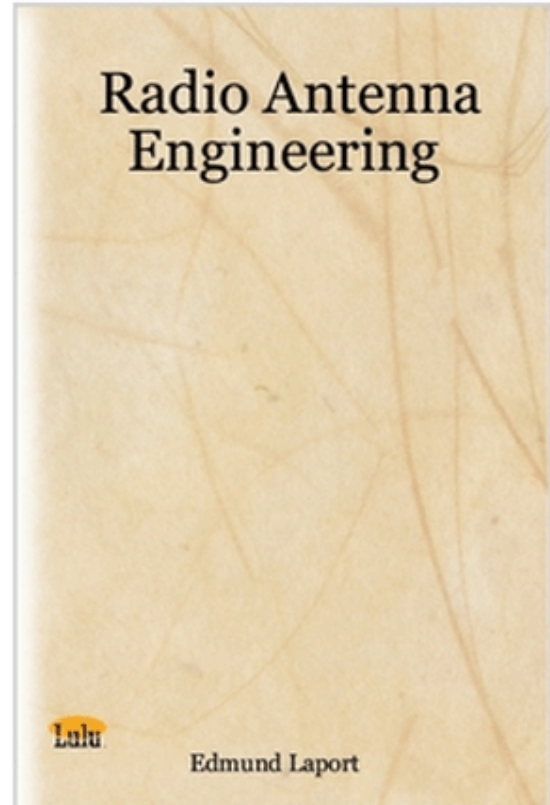
I'm pleased to announce that Edmund A. Laport's textbook **Radio Antenna Engineering** is now available in electronic form.

The Book

Radio Antenna Engineering was published in 1952, and presents an excellent overview of the state of commercial antenna system engineering as practiced in the first half of the 20th century. As its name implies, it's not solely about electromagnetic or radio or antenna *theory* although these issues are certainly a part of what it talks about. Rather, it focuses on matters surrounding the nuts and bolts (and logs, beams, bars, wires, and insulators) of actually designing and implementing a large-scale antenna system. As Laport writes, *There are three basic aspects of antenna engineering. The first pertains to radiant energy in space around an antenna system, as well as the current distributions that produce the radiation pattern. The second pertains to antenna circuitry and involves such matters as self- and mutual impedances, currents, potentials, insulation, and feeder systems that will yield the desired current distributions. Third there is the structural engineering which has to do with all the mechanical details of supports, rigging, materials, strengths, weights, hardware, assembly, adjustability, stability, and maintenance. While each aspect must be separately developed, the final design must be an integration of the three, with a minimum of compromise and within reasonable economic limits.*

The book includes an introduction to radio theory (referring the reader to works by Kraus, Terman, and others for more detail). The first three chapters discuss the specification and design of large antenna systems, broken down by the frequency ranges they serve: low frequency, medium frequency, and high frequency. Three additional chapters discuss transmission lines, impedance matching techniques, and logarithmic potential theory. Each chapter is well supported by drawings, charts, photographs, and an extensive bibliography of references.

Radio Antenna Engineering is noteworthy for its collection of photographs of early and mid-20th-century radio transmission facilities and construction practices. It also has an extensive discussion of HF long-wire antennas, including single-wire types, V designs, rhombics, and fishbones.



Edmund A Laport
Chief Engineer,
RCA International Division,
Radio Corporation of America,
Fellow, Institute of Radio Engineers
1952

*--- Scanned and Prepared by
 Dave Platt AE6EO---*

Radio Antenna Engineering is certainly of significant historical interest, and may be of practical use as well. Although some of the designs and practices portrayed in it have been supplanted in commercial service, much of its content can still be of significant value to amateur-radio operators and to those interested in the practical aspects of high-power radio operation in the lower-frequency RF bands.



The Electronic Edition

Some time in January 2005, I decided to give up.

I figured I'd never be able to buy a copy of **Radio Antenna Engineering**. I'd heard about it ever since shortly after I got my amateur-radio license. I'd searched the Web for it, found numerous references, and found not a single used-book dealer who would admit to having a copy or knowing where one might be obtained. It seemed to be frequently sought after, and not often available. I'd checked eBay, had seen precisely one copy offered, and had lost the auction (after bidding a rather extravagant amount of money).

I decided I'd have to "settle". Upon checking with my city library, I found that although they didn't have a copy, there were several universities and colleges in the state which did, and that I could check out a copy for three weeks via a inter-library loan. At least I'd be able to read it.

Then, the thought struck me - I have a flatbed scanner. If I found the book to be interesting enough, I could scan the book and have an electronic record of the book that I could consult. I could convert it to a standard, portable format (PDF) using various freely-available software tools on Linux.

I could even give this electronic version to other people... if it was legal to do so. I did a bunch of research, and concluded that it was! See below for a discussion of the copyright issues involved.

What I'm making available here, is the results of my efforts. The book is available in PDF format, complete with bookmarks for the chapters and sections, appendices, and index. It has *not* been through an OCR (optical character recognition) process: the text and line drawings and charts are in the form of 300 dpi black&white scan images. This greatly reduces the risk of typographical errors or mis-transcriptions, but means that the text of the book is not searchable via electronic means.

I've actually created two different electronic versions. They differ only in the resolution and quality of the photographs. The "ebook" version has the photographs stored internally at a resolution of 150 pixels/inch, in JPEG format, with moderate data reduction. The "printer" version has the photographs stored at 300 dpi, with less data reduction, using lossless "Flate" data compression - it's about 50% larger than the "ebook" version. Most people won't notice the difference in image quality. The only reason I'd suggest for downloading the "printer" version is if you have a really good 1200-dot/inch (or better) printer, and want a really high-quality printed version.

There's probably somewhere around 30 hours of work invested in this project... scanning, re-scanning, writing Bash and Perl scripts to do things with the NETPBM software tools which would probably give their authors a case of the screaming horrors, using The GIMP to clean up the scans and extract the photographs for special processing, figuring out how to use GhostScript to create the PDF, creating the bookmarks and other PDF markup request, proofreading, etc. The image-processing steps alone required several hours of CPU-crunching on a 2.4-gig P4 Celeron system, and heated up our den quite significantly.

All in all, it was quite an interesting experience. The results are certainly less than perfect - some artifacts from the scanning process remain - but even in its current state I find the end product to be worthwhile. I hope you do, as well.

And, in one of those marvelous cosmic moments of irony, it turned out to be unnecessary (at least for me). After I finished scanning the library's copy and returned it, and before I got started on the image processing, I won an eBay auction for a copy of the McGraw-Hill printed edition in mint condition.

Paperback copies are now available

Beginning on 9/2/2005, perfect-bound trade-paperback printed copies of **Radio Antenna Engineering** can be ordered via the print-on-demand publishing service at www.lulu.com. The Lulu paperback edition has the same text and photographs as the freely-downloadable "printer" version, but is optimized for the 6"-by-9" printing format and includes only a small single-page edition of the appendix map. You can see the details and place an order (if you wish) via <http://www.lulu.com/content/159004>

This service is being offered as a convenience, for those people who may not wish to go to the trouble of downloading and printing a hardcopy themselves. The price you pay Lulu is for the printing and binding of the book and cover - I'm not collecting a royalty and they're waiving their commission. With standard USPS shipping, the total cost should be under \$20 for U.S. addresses, and this seems like a very fair price to me.

Copyright and distribution issues

Radio Antenna Engineering was published in 1952, and bears a copyright in the name of McGraw-Hill (the publisher). Under the laws of that era, this initial copyright was valid for a term of 28 years, and expired in 1980. The copyright could be renewed in the last year of this initial term for a second term of 67 years. Under the laws then in effect, this renewal was *not* automatic - the renewal had to be registered by the copyright holder in a timely manner.



Based on all I've been able to find out, I believe that the copyright was *not* renewed. I've searched the Library of Congress online database of copyright registrations and actions for 1976 and onwards, and have found no evidence that McGraw-Hill, Laport, or anyone else ever renewed the copyright on this book. I contacted McGraw-Hill's rights-and-permissions department asking whether they believed that they still held a valid copyright, and they sent me a letter stating that they "no longer control the rights" to this work. They suggested I contact Laport at RCA... and to the best of my knowledge Laport is a "silent key" (there's a greenhouse dedicated to him at an arboretum in New Jersey).

The upshot of all of the above, is that I believe that the copyright on **Radio Antenna Engineering** expired at the end of its original 28-year term, and that the book passed into the public domain on December 31st, 1980.

The electronic version I have created is a "derived work" of the original printed version - it's a translation of the work into a new format, with significant editorial effort involved in its creation. As such, it qualifies for its own independent copyright protection under United States law, and I am choosing to copyright it in order to control the terms of its use and distribution.

SOME RIGHT RESERVED!

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To summarize it all briefly: you (as a member of the public) are granted permission to copy this electronic work, distribute it, use it, and create further derivative works, as long as:

- You aren't doing it for commercial purposes, and
- You give credit to the sources of the work (Laport as the original author, and me as creator of the electronic version), and
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So, go ahead - download it, read it, stick it in your library, print a few copies for your friends, burn a couple of dozen onto business-card-sized CDs and hand them out at a hamclub meeting, stick it up on an HTTP server - as long as you aren't charging money for it, it's cool with me.

Naturally, the copyright on this electronic version and its derivatives applies *only* to those! It doesn't apply to the original printed version, which is now in the public domain. Nor does it apply to electronic versions created independently by someone else. If you think you can make an honest dollar by selling printed or electronic copies of this book, you're free to do as I did - find a printed copy, scan it, and clean it up. As long as you don't use *my* version commercially, it's cool. If you *do* mis-use my version for commercial purposes, then may you have a conscience-twining encounter with a Rettysnitch in the near future!

Happy reading!

Dave Platt AE6EO



Photo circa 1938