# RHdb - An Explanation

Radio Hobbyist's Designbook or RHdb (for short) was designed to guide you into design of electronics apparatus that relates to radio. It assumes you know something about electronics but you can skip Chapters which cover familiar subjects. Mathematics needed in design is down to simple algebra and trigonometry. Topics cover the frequency spectrum of DC through VHF.

You must supply the brainpower. But RHdb can be your main reference, a guidance toreaching your personal hobby goal. RHdb is written in a sort of Reader's Digest format: Short and to-the-point, covering things simply with a minimum of words. Grouping is in 5 sections as givenbelow with a synopsis of Chapters:

## BASICS - Click to download (5.1MBytes .pdf)

Title page, dedication, brief history of origin, Table of Contents

| | |
|---|---|
| Chapter 1: | Bare bones of what is needed to do design at home, a common-sense appr |
| Chapter 2: | Mathematics needed in design, often-used constants; Greek letter common |
| Chapter 3: | Waveforms, Heterodyning, Mixing; with easier form of mixings' spurious pro |
| Chapter 4: | Bandwidth, Modulation, Noise; Shannon's Law, John Carson's original form |

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|---|---|
| Chapter 5: | Basic sources, E-I-R, DC laws; a review of basic DC with Kirkhoff's Laws |
| Chapter 6: | Passive R-L-C Components; a quick look at AC Laws and basic component |
| Chapter 7: | Resonance, single and multiple; more on AC Laws and introduction of Q. |
| Chapter 8: | Two-component matching circuits; going into complex arithmetic and circuits |
| Chapter 9: | Three-component matching circuits; some control of bandwidth versus Q, st |
| Chapter 10: | Basic L-C Filters; Based on Modern Network Design, the Lowpass Prototype |
| Chapter 11: | Bandpass, Highpass, Bandstop Filters; Transforming Lowpass Prototype int |
| Chapter 12: | Resonator bandpass filters; easier-to-calculate relatively narrow bandpass f |
| Chapter 13: | L-C Practicality and Stagger-Tuning; Limits on L and C practical values; usin |
| Chapter 14: | Quartz crystal units and Narrowband bandpass filters; basics of quartz units |
| Chapter 15: | Variable L-C Tuning methods; Changing tuning spans of variable capacitors |
| Chapter 16: | Low Frequency Transformers; Practical construction of E-I Core transforme |
| Chapter 17: | Wideband Transformers and BALUNs; General wideband transformers, type |
| Chapter 18: | Transmission Lines; General discussion of lines, characteristic impedance, s |
| Chapter 19: | Homebrewing, Construction, Packaging; Where to do it, suggested worksho |

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|---|---|
| Chapter 20: | Vacuum Tubes; General discussion, types from diode through pentagrid; |
| Chapter 21: | Semiconductor Basic Applications; biasing, major connections, typical circui |
| Chapter 22: | Basic Power Supplies; AC Mains powered capacitive-input rectifiers, half-wa |
| Chapter 23: | Digital Logic Basics; from Relays through TTL to Advanced CMOS, basic G |
| Chapter 24: | Selection, Arithmetic, Switching Logic; Forms of gate arrangments with and |
| Chapter 25: | Flip-flops, Counters, Dividers, Registers; how they work with emphasis on In |

Chapter 26: Pseudo-Random Shift Generators; Lengths, periodicity, tables of feedback,
Chapter 27: Other Stables: Monostable (one-shot) and Astable (free-run) multivibrators,
Chapter 28: Position, Detection, Conversion Logic; Gray Code, methods of detecting mo
Chapter 29: Oscillators; Common types shown for L-C and quartz crystal control of frequ
Chapter 30: VFAs, CFAs, and Related; Operational Amplifier circuits of Voltage feedbac

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Chapter 31: Switching Converters; types and value calculations of switching power su
Chapter 32: PLLs and DDSs; Phase-Lock Loops and Direct Digital Synthesis types for p
Chapter 33: Modulation and Demodulation; Methods of the basic types in hardware and

Chapter 34:

Miscellaneous Subjects; Various terms and formulae of older laws that have been largely superceded i
Chapter 35: PIC Microcontrollers; General treatise and command set of the Microchip Te
Chapter 36: Elemental Metrology; Analog meter circuits, differentiation of Response and
Chapter 37: Advanced Metrology; More complicated test equipment and circuits.
Chapter 38: Military Radio Systems and History; A look at military radio from 1938 to pre

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Chapter 39: A TRF receiver for WWVB on 60 KHz; With construction details of a Loop
Chapter 40: Genesis of a SW BC Receiver Project; Largely from memory and notes of 1
Chapter 41: Requiem and Resurrection of the SW BC Receiver; Describes the general f
Chapter 42: Multi-Band Converter; Front end for any low-HF Monoband receiver to reach
Chapter 43: Monoband Receiver; a converted ARC-5 receiver from WWII surplus modifi
Chapter 44: Regulated Voltage Supplies; All those required for the Chapter 41 to 43 rece
Chapter 45: A Microcontroller for the LF-MF-HF Receiver; A PIC microcontroller with hig
Chapter 46: Finesse in Microcontroller Programming; A step-by-step method of successi
Chapter 47: A Discrete-IC Digital Dial; Frequency Read-Out function of the Chapter 45 m
Chapter 48: Evolution of the Monoband Receiver; Various specialty ICs that can incorpo
Chapter 49: An All-Semiconductor Monoband; A solid-state version of the Monoband of
Chapter 50: Re-Building the LF-HF Receiver; That of Chapters 41 through 43 re-built int
Chapter 51: Simplest-Control SW BC Receiver; Design details never fully built to show th
Chapter 52: Converting a Heath SB-300 series receiver; An intellectual exercise to exam
Chapter 53: Simple RF Generator for Testing; Making a frequency-control-by-switches ty
Chapter 54: A Conclusion; Some personal commentary on commercial electronics produ

That's it for RHdb...as it is this date. There may be more things added later. Those who build things from this book collection have the resources to figure out operation with aid of resources listed. Sorry, but I cannot spend the time to answer general questions by mail or post; there is only so much time left each day. There may be some slight errors here which I will acknowledge despite prolonged and thorough self-editing; those will be posted as they are discovered. This is, after all, a free set of comprehensive information for all to use for their own purposes.

Happy hobby to you all,

Leonard H. Anderson, K6LHA, 20 June 2014

**Note: Emails sent via the Contact Page in regard to this book, will be forwarded to the author.**