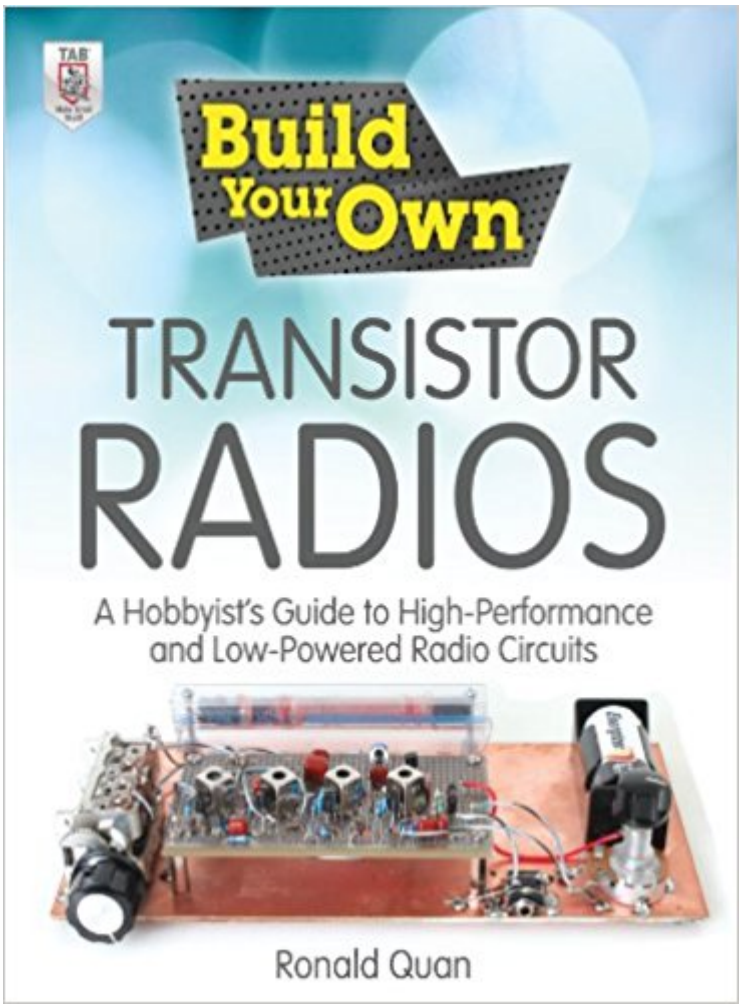
Build Your Own Transistor Radios: A Hobbyist's Guide To High-Performance And Low-Powered Radio Circuits



Synopsis

A DIY guide to designing and building transistor radios Create sophisticated transistor radios that are inexpensive yet highly efficient. Build Your Own Transistor Radios: A HobbyistÃ¢â ¬â„¢s Guide to High-Performance and Low-Powered Radio Circuits offers complete projects with detailed schematics and insights on how the radios were designed. Learn how to choose components, construct the different types of radios, and troubleshoot your work. Digging deeper, this practical resource shows you how to engineer innovative devices by experimenting with and radically improving existing designs. Build Your Own Transistor Radios covers: Calibration tools and test generators TRF, regenerative, and reflex radios Basic and advanced superheterodyne radios Coil-less and software-defined radios Transistor and differential-pair oscillators Filter and amplifier design techniques Sampling theory and sampling mixers In-phase, quadrature, and AM broadcast signals Resonant, detector, and AVC circuits Image rejection and noise analysis methods This is the perfect guide for electronics hobbyists and students who want to delve deeper into the topic of radio. Make Great Stuff!TAB, an imprint of McGraw-Hill Professional, is a leading publisher of DIY technology books for makers, hackers, and electronics hobbyists.

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Customer Reviews

Excellent bookÃƒÂ¢Ã â ¬Ã Â| However, you need the knowledge, experience and test equipment to build these radios (especially the superhets).Mr. Quan gives the reader a low cost approach to build test equipment using digital chips and while these may be okay for some folks with previous experience, I strongly recommend at least the following equipment:1) Some type of spectrum analyzer with marker capability and a low noise amplifier or probe on the front end connector that allows you to ÃƒÂ¢Ã â ¬Ã Å“sniffÃƒÂ¢Ã â ¬Ã Â• signals without loading to troubleshoot the circuits,2) A RF signal generator capable of putting out signals in the range you are attempting to tune for, and3) Some type of component measuring equipment with mini grabbers to attach to the components and give you at least a reliable way to measure capacitance and inductance (such as a Sencore LC102), and, of course, a decent DVM (with 10Mohm input impedance minimum) and adjustable power supply.Otherwise, it will be a very frustrating and time consuming experience; especially when you order adjustable capacitors (caps) online and attempt to wind an antenna transformer or other coil or caps from a junk radio with your cap to the resonant response of the signal you are attempting to build since you have to tune the antenna and oscillator response separately for the best frequency response possible for the superhets or others.Yes, the book has some sections that could be improved, such as clearly labeling some connections on the schematic for the transformer connections on the superhet schematics (took a little thinking to figure out). It would also have been nice to have more pictures of Mr. QuanÃƒÂ¢Ã â ¬Ã â„¢s radios since thereÃƒÂ¢Ã â ¬Ã â„¢s only a few for reference (thatÃƒÂ¢Ã â ¬Ã â„¢s why I gave it 4 stars).I should also point out that no one in the comments has mentioned that the 42IF100 coil VC1 osc and ground connections are mislabeled in the book on pages 100 (Fig 8-5B), 105 (Fig 8-6B) and 108 (Fig 8-7). If you wire it per the ÃƒÂ¢Ã â ¬Ã Å“bottom pin viewÃƒÂ¢Ã â ¬Ã Â• schematic in the book, the first oscillator will never work. The inductance is too low between pins 1 and 2. I had to reverse the wires on the VC1 osc and the ground connection to make it work. You can confirm by checking the back section Appendix 2 (Pg. 459) where the transformer pins with inductance values are listed. You will notice the inductance between pins 1 and 2 are 0.6uH which will not work. You need at least 300 uH or so (inductance between pins 2 & 3).To be successful with these projects, the builder needs to have a level of practical circuit building skills & soldering (especially on a

ground plane) which goes beyond building circuits on solderless quick proto boards (the ones that allow you to plug in & remove wires for low frequency digital circuits) or simple DC projects. If you use these solderless boards, it is almost guaranteed they wont work as intended because of the stray capacitance on these boards. I wouldnÃƒÂ¢Ã â ¬Ã â„¢t even attempt it.At a minimum, to make these circuits work you need to build them on either a point to point solder (vector) board or a copper clad for the ground plane (which is critical) and wire the other points in the air (like the author) as I did from the 4 transistor radio schematic. You donÃƒÂ¢Ã â ¬Ã â„¢t need a layout (only the schematic). That's what makes it fun. Then, once you have a working prototype, you can attempt to start laying it out if you so choose.For those who say they canÃƒÂ¢Ã â ¬Ã â„¢t build without a layout-note that from pictures, the author built some of these by wiring the parts in the air which explains why he does not have a layout as shown on Pg. 122, Fig. 9-5. The radio on Pg. 123 (Fig. 9-6) was built using point to point (on a vector board) which also doesnÃƒÂ¢Ã â ¬Ã â„¢t require a layout (the layout is the picture). In addition, you donÃƒÂ¢Ã â ¬Ã â„¢t have to worry too much about high frequency (close to microwave) PC board effects on these circuits.It would have been nice if the author had included the layout. All you need is the schematic and these circuits will work if you build them on copper clad boards without a layout just as the authorÃƒÂ¢Ã â ¬Ã â„¢s pictures on the cover or pages 122 & 123. As of this writing, I havenÃƒÂ¢Ã â ¬Ã â„¢t tried building the other TRF or Reflex radios.On the pictures from my first prototype, the red and black mini grabbers are for the power supply and the 2 red mini grabbers are for the audio connections. The audio circuit was only built on the board up to the audio driver circuit and the 2 red leads are attached to the audio driver transformer secondary (for a total of 3 P/N 2N3904 transistors) for which a external audio amp is being used. Notice most of the connections are in the air. If you donÃƒÂ¢Ã â ¬Ã â„¢t build it up to the audio driver, there wonÃƒÂ¢Ã â ¬Ã â„¢t be sufficient signal to drive an external audio amplifier. The potentiometer (pot) on the side of the board is the audio control for the driver circuit.The antenna is also very important. The test antenna (pictured) works best when I put my hand on it. IÃƒÂ¢Ã â ¬Ã â„¢ll be experimenting with adding some extra wire and other antennas with bigger ferrites in the parts bin that need to be rewound (have lower inductance).

I have built three radios from this book ÃƒÂ¢Ã â ¬Ã â œ TRF radio from page 57, the regenerative radio from page 90 and 8-transistor superheterodyne radio from page 105. I used crystal earphone for the TRF and regenerative radio, and they worked amazingly well. Similarly, I was really surprised how well the commercial 8-transistor superheterodyne radio worked. I used a speaker for the

output, and I could hear several AM bands, definitely a lot more and lot more clearly as compared to the earlier two I built, and felt really proud showing off to my friends, because the audio output quality matched closely with the commercial AM radios. I used copper clad board for these, similar to the one in the cover of the page; was difficult at first, but got easier to layout and solder the circuit when I got to the third one. It is definitely easier to build them using copper clad board.Besides building these circuits, I also love the theoretical explanations of several concepts in the book. Sure, itÃƒÂ¢Ã â ¬Ã â„¢s focused more towards practical purpose of how to build things like amplifiers, oscillators, IF circuits but I believe the concepts are well explained in a nice and simple way. Being an electrical engineering student, I find these explanations much more helpful and insightful as to the few analog and RF circuits textbooks I have read. I highly recommend this book, and building the circuits and seeing them work is great fun.

I must admit that I came to this book somewhat math challenged.I tend to be more interested in a historical perspective. But having said that, Mr. Quan has written a book that somehow manages to cover all bases here.Using the AM radio as a context, starting with the most basic simple circuits, then building upon each concept, he manages to cover the history and development of the major types of circuits used for AM radio reception, and the math and theory behind each circuit building block, show plans and schematics with detailed parts lists and sources to not only construct several types of AM radios, but also to make your own test oscillators and modulators for developing and testing circuits under construction. He also has a section covering the details of other equipment needed, and some inexpensive ways to obtain it, to equip your "radio electronics experimentation lab".He goes on to discuss improvements to circuits and trade-offs in further development between performance, cost and power consumption giving you the chance to improve designs previously constructed and measure the improvements.All this is presented in a well illustrated, intuitive, entertaining, easy to grasp form, that actually manages to give a reasonably complete analog electronics education by covering the various building blocks of the humble AM transistor radio including power supplies, oscillators and amplifiers as well as everything else specific to an AM radio.If you spend any time with this book you will not only learn to build and design your own AM radio circuits, but you will be well on your way to understanding a lot of the theory behind all analog electronic design. Well done !

The author does a nice review of the basic types of AM radios. The projects use currently available parts and the plans all look workable. I particularly enjoyed the write up about SDR radios. For fun I

ordered up the parts to build the superhet using the 455 KHz ceramic resonators. The parts I needed just showed up from Mouser who had them in stock. The plan looks sound and I'm expecting it to work. If you like to build electronic devices you will have fun with this book. Many of the designs can be easily reworked for other frequencies.

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