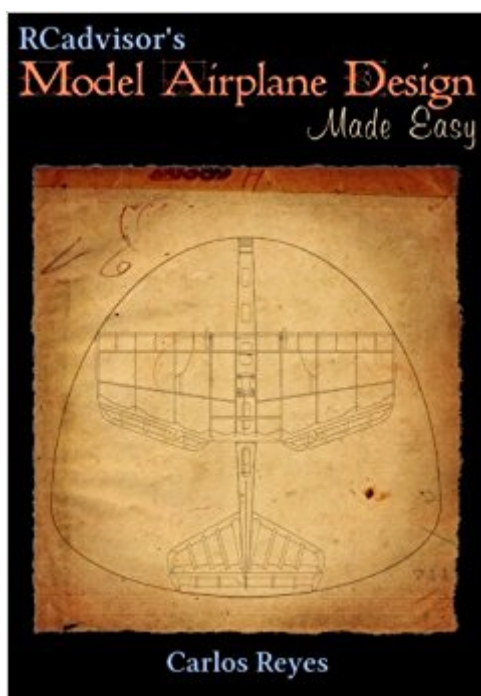


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# RCadvisor's Model Airplane Design Made Easy: The Simple Guide To Designing R/C Model Aircraft Or Build Your Own Radio Control Flying Model Plane



## Synopsis

Build and fly your very own model airplane design. Using clear explanations, you will learn about important design trade-offs and how to choose among them. The latest research and techniques are discussed using easy to understand language. You will discover: The special challenges faced by the smaller models and how to overcome them. How to choose the right material for each part of the airplane. Easy rules for selecting the right power system, gas or electric. When it makes sense to use one of the innovative Kfm airfoils. Pros and cons of canard and multi-wing configurations. A step-by-step design process that includes goal setting and flight testing. In-depth discussions of important topics like airfoils and wing design. The sources of air drag and how to minimize their impact.

**ADVANCE PRAISE** "This book is a joy to read! The writing style and wit add dimension in a way that is rarely found in today's reference materials. If someone has considered designing their own airplane and been put off because of complicated formulas, vocabulary and reference style that would bore even an engineer, this will convince them to go ahead and try it. Written with real people in mind and not engineers - and I mean that in a good way. This is a book that will reside along the other favorites on my bookshelf. Carlos really managed to produce a book that will last a long time and become one of the standards for modelers." - Greg Gimlick, Electrics columnist, Model Aviation magazine

"RCAdvisor's Model Airplane Design Made Easy is the ultimate model airplane design book for both beginning and experienced modelers." - Richard Kline, Inventor, Kfm airfoils

"RCAdvisor's Model Airplane Design Made Easy is a real contribution to the world's literature on the subject. It provides an excellent bridge between full scale aviation and aeromodelling, showing the relationship between the two, for better understanding of the differences and similarities which should be applied for good model performance. While thorough in detail, the book is also easily readable so that the information is simple to understand. It is a very good combination of theory and practical application. Nicely illustrated, the book is also full of common sense explanations and references to other sources of information." - John Worth, former President and Executive Director of the AMA

"Carlos Reyes personably leads the reader through some basic aerodynamics, materials considerations, electric power system planning and a practical application of theory as it is applied to a finished flying model. The background history of various types of aircraft shows the development of aviation and how it relates to the models that we build and fly today, as well as how models have influenced general aviation. It is always exciting to find some 'new to me' concepts and theories, and there were several in this well-written narrative." - Ken Myers, Editor, Ampeer electric flight newsletter

"No matter how long you've been aeromodelling, or what your interests are in our great hobby, the greatest thrill of all is standing behind a unique model that you've designed and

built yourself, from a blank sheet of paper - or even a blank CAD file - and preparing to make that first take off. So sit yourself down in a comfy chair, read RCadvisor's Model Airplane Design Made Easy and set off on aeromodelling's greatest adventure. Let Carlos Reyes - an aeromodeler of long standing and great talent - take you through the mysteries of how to arrive at the point that every lover of model aircraft should experience." - Dereck Woodward, aeromodeler, designer and magazine writer for the past fifty years

## Book Information

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## Customer Reviews

This book is definitely needed by anyone getting into R/C or is a veteran flight fanatic! Tons of good info that racks my brain and gets me thinking. --Jamie Burke, Host, AllThingsThatFly.com

This book is a joy to read! The writing style and wit add dimension in a way that is rarely found in today's reference materials. If someone has considered designing their own airplane and been put off because of complicated formulas, vocabulary and reference style that would bore even an engineer, this will convince them to go ahead and try it. Written with real people in mind and not engineers - and I mean that in a good way. This is a book that will reside along the other favorites on my bookshelf. Carlos really managed to produce a book that will last a long time and become one of the standards for modelers.

I read this book as soon as I got it. First, let me say that overall, the book is well written and my time

reading it was not wasted. It provides a basic background in aerodynamics. Yet, the title of the book states that it deals with designing your own model airplane. This is extremely misleading in that there is nothing that talks about actual aircraft design or elements of the plane such as wing shape, lengths, widths of tail feathers, location, cg. There is nothing that tells you how to begin designing an aircraft from scratch, armed with only a pencil, ruler, paper and an idea. This is very unfortunate because I like the writing style of the author and I believe that if he had discussed putting together different design elements, the book would be stellar. As is, the book talks about all the elements affecting the plane, but not about the plane itself. If I knew this before I bought the book, I would not have bought it. Therefore, I give three stars for how well written the book is and how easy it is to understand, but I would only give it one star for actual aircraft design techniques.

book covers theory of aerodynamics, materials of construction, propellers, power systems, and some stability. This is too much to present in one book. Most of the topics deal lightly with design guides and concentrate on broad-brush theory. A better title would be something like "Summary of Design Theory for Model Airplanes".

This book as a whole is poorly done. Its principal fault is that you are simply told what to do, instead of educated what to do. Otherwise the faults are: 1) no diagrams 2) unsatisfactory supporting evidence/explanations 3) omissions 4) useless factoids 5) mistakes. The only useful part is the bibliography. First of, there are no diagrams in this book! Every aerospace book that I looked at included some kind of diagram about something. The author mentions that he had built models himself, but provides no examples, no designs, etc. This is inexcusable. In the whole book I counted only 4 pictures of model airplanes. The other 14 pictures are of full sized airplanes which didn't show anything useful. Second. He will tell you his opinion and not explain them well. I didn't know much about airfoils when I started to read this book, so to me when Reyes talked about airfoils it was new information. His general recommendation was to use the GA(W)-2 / LS(1)-0413 / NASA LS(1)-0413 airfoil for the wing because it's popular for general aviation use, and NACA 0012 for the horizontal stabilizer. You're supposed to take his word on this. He then says that at 100,000 Reynolds number (as a hint, indoor models are well below that the rest are about 70k to 200k) or less the NASA LS(1)-0413 airfoil doesn't work so well. Why? I had to find this out in another book. While reading *Aerodynamics for Naval Aviators: NAVWEPS 00-80T-80* (FAA Handbooks series) I came across a section that explains what happens to an airfoil under high and low Reynolds number. Using NACA 4412 as an example, I could tell from the diagram in the book that

at an Re of 9 million the airfoil will develop the highest lift coefficient at an angle of attack of 14 and stall past 15, while at Re of 100000 this will happen at of 8 and 12 AoA. As explained in that book this is because at low Reynolds numbers the flow will become laminar and will not have enough energy to stick to the wing at higher angles of attack. To me this make much more sense than saying that "it will not work as well." I then compared the Clark-Y airfoil against Reyes recommended airfoil LS(1)-0413 that he favors over the Clark-Y, on airfoiltools dot com. To me at Re of 100000 the Clark-Y actually looks like a better choice. While it might look like that the LS(1)-0413 develops a slightly higher  $C_l(\max)$  overall at 11 AoA, and stalls at 14, the Clark-Y will reach a lower  $C_l(\max)$  at 12 AoA - but will stall out at 18 AoA. To me that seems like a better deal. A higher max AoA means more room for control error, gusts, etc. A proper book would have provided way for you to make that decision yourself. I then read "Model Aircraft Aerodynamics" and realized that there is also something called a critical Re number. So an airfoil that does not "work well" below an Re of 100000, what that actually means is that the airflow completely breaks down. The critical Re number is the number you want preferably below the stall, not the number the plane will actually fly at! While the book has many formulas, oddly enough he suggests a cryptic method for calculating vertical stabilizer size by cutting out pieces of cardboard based on side body profile and certain wing area size. I get that there is trial an error involved with reading "Model Aircraft Aerodynamics" in respect to dutch roll and spiral stability, but Reyes seems to suggest that it's easy. Reyes makes some points on materials, engines, batteries, etc. But In the end I have no idea how any of that goes together. Third. In the end a wing airfoil is just one part of a wing, yet he doesn't talk about wings themselves. His only wing planform is the crescent shape! What about explaining how different wing planforms effect tip stalls, which is included in every aerodynamics book? Rectangular, delta, swept, etc. There is no mention of flaps besides him telling you that they serve no purpose on a slow flying model. Fourth. Some of Reyes book reads like some of the first parts of "Aircraft Design: A Conceptual Approach (Aiaa Education Series)". There are countless small factoids and side points included by Reyes that cover full size airplanes that frankly should have been edited out do to the objective of the book. For example both Authors mention Rutans' VariEze, Raymer mentions that that the winglets on the wings presented a novel dual use design in that they serve as both winglets and vertical stabilizer/rudders, while Reyes mentions that it was the first airplane with winglets. Raymers' point in the context of an airplane design book is interesting, Reyes point in a model design book on the other hand is useless. I expect model specific examples! Fifth. There are many formulas and some tables with calculated values, but when I tried to use Table 6.1. Scale Factors on page 124 it

became apparent that the figures provided for weight % are incorrect. Instead I looked through the Bibliography and started a search for the recommended books instead, and in starting to read some those (Simons, etc) I have to say they are miles apart.

Over the years I've accumulated most of the books on Model Aircraft design - from Frank Zaic's 1987 edn. of "Circular Airflow" to the latest version of Martin Simon's "Model Aircraft Aerodynamics". This one joins the list of the very few (like those two and the somewhat brain-testing but excellent stuff by Ferdinando Gale) that get top marks. Having long ago trained as an Engineer I have a soft spot for numbers that are useful and Carlos has brought off that very difficult task: writing about quantitative things that are complex with just the right amount of numbers and formulae. Any modeller with the most basic math (think multiplying and dividing and fractions!) could follow his descriptions which are deceptively simple and easy. This book is for non-experts because it is a great read, easily accessible and welcoming but make no mistake this is an expert book by an expert. Carlos has a rare ability to distill in personable and direct prose some very important stuff. And it's not just classical aerodynamics. He covers a huge range of topics from airfoils to adhesives, particularly some that get little attention elsewhere like propeller performance, in a friendly format by focusing on the key information. His explanation of lift is a classic example. Just 3 short elegant paragraphs covers the essence of the Bernoulli explanation with a fourth noting that there is an alternative. For practical modelers his "It is not a bad way of looking at the phenomenon, but it is less useful when doing computations than the pressure differential explanation" beats the many pages of circulation theory and bound vortices others labor over. I can't recommend this book highly enough. Think of it as the Cognac of Model Aerodynamic texts. Instantly accessible without years of experience in fine wine tasting but with enormous depth and content. An extra point for recognizing that not everyone lives in the US and metric units are important too. :-)

It's an absolute bargain at the price.

This book does indeed have it all. In a straightforward and easily understood format to boot. Kudos to author Carlos Reyes!

A useful book full of useful simple formulae. My favourite quote was (sic) "The Diesel Engine never really caught on". After I got to 100 diesel engines from multiple nationalities I gave up. Obviously to the author the World ends at the borders of the United States! After this a good follow on would be Model Aircraft Aerodynamics by Martin Simmons, also available through . An excellent tome now in

it's fourth edition.

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