Review of:

Amateur Rocket Motor Construction

David Sleeter

The Teleflite Corp. [ISBN 0-930378-04-X], 2004

John Steinberg

3944 Carthage Rd, Randallstown, MD 21133, USA

As President of the Pyrotechnics Guild International and as an avid rocket enthusiast myself, it gives me great pleasure to provide a glowing review for this exemplary text. Superlatives are truly in order. While my personal interests lie more along the lines of pyrotechnic rocketry, this book, focused on amateur rocketry, nevertheless was a pleasure to read.

The book is exhaustive in its scope and well organized. The reader may explore amateur rocket motor construction in as little or as great depth as desired. It is by far the best book on the subject I have read.

Sleeter's book begins with an historical review of the subject and a discussion of the work done both in remoter history and by our more modern predecessors. A political and philosophical discussion of issues related to this hobby in the modern era in the United States is included. This reviewer finds himself in wholehearted concurrence with the author's perspective. A sober and balanced review of both safety and the necessary legal requirements is presented in detail. Safety is foremost in the author's presentation throughout the text, in all aspects of testing, compounding, and firing of motors.

The second chapter discusses the basics of rocket motor tubes and types, their classification, and nozzles. Both core-burners and end-burners are discussed. A thorough discussion of rocket tooling follows in the next chapter. While many enthusiasts will not be machinists, the depth of the discussion extends to tool manufacture and machining in the next two chapters. The book is accompanied by superb illustrations throughout which make the understanding of the technical aspects of machining accessible to all readers.

Chapters Six and Seven provide information on chemicals used and the preparation of these chemicals for use in rocket motor fuel compositions. Sources and types of chemicals are given. The discussion of charcoal types, particle sizes, and uses for rocket motor fuels is as good as any I have read. Tube construction and purchase are each presented in detail in Chapter Eight.

Chapter Nine details the basic fuel compositions and variations on these major themes. Burn rate adjustment, use of binders, mixing and preparation are presented in a logical and coherent fashion, again, well illustrated as may be seen in every section of this excellent book.

Chapter Ten provides, in seventy odd pages or so, the best-illustrated and most lucidly written description of rocket motor assembly and construction available to the hobbyist. All pertinent aspects are reviewed in detail. Nozzle formation, use of tooling, containment devices, spindles, and accessory tools are provided. Problems the novice is likely to experience are addressed, and solutions to these common dilemmas are offered. Two stage motors are reviewed, as is the concept of the "passfire" and other ignition techniques.

Chapters Eleven through Fifteen discuss in superbly illustrated detail the construction, design, and performance characteristics of motors for each of the basic fuel types. The technical detail and engineering perspective in these chapters make this book a superb reference text for those interested in the details of power characteristics and the influence of these factors on flight performance.

Chapter Sixteen provides an historical perspective on the rockets that the author initially made, which used damp fuel and were dried after assembly. Currently, the author uses dry compositions, which are rammed or pressed to form the grain.

In keeping with the encyclopedic range and depth of the information presented, Chapter Seventeen illustrates the preparation of various types of electric igniters for use in rocketry.

As reliable and predictable flight is critically dependent on reproducible motor performance, the author devotes Chapter Eighteen to a detailed discussion of test equipment and data recording. Well-written text and profuse illustrations make this technical material every bit as accessible and useful as the more basic material in earlier chapters.

The final chapter, much to this reviewer's delight, not only discusses the basics of rocket flight and launching, but also, in two short pages, provides the clearest discussion of rocket aerodynamic stability that I am aware of. While I have seen numerous physics oriented discussions of the center of pressure and the center of gravity, this text and the accompanying illustrations provide the most useful presentation of this material for those who seek to make rockets that begin to fly in a stable manner and remain stable throughout their entire flight. Even after ten years of making and flying rockets, this reviewer gained a better understanding of this simple, yet, often all too hard to grasp subject. The transition of these two points as fuel is consumed, a non-wind tunnel approach to easily determining the center of pressure, and a discussion of the ideal spatial relation between the CP and CG were the final treat at the end of a consummately well-written text.

In summary, whether your interest in the subject of amateur rocketry is superficial or detailed, historical or practical, whether you wish to engage in this hobby or merely to gain an understanding of it, whether you are an expert machinist and engineer or a person who is all thumbs, this book has something of value for you. I cannot recommend it highly enough. This book by David Sleeter is a most welcome addition to the rocketry literature and should be in every pyrotechnists and rocketeer's library. I urge you to purchase your copy today.

The book is available from several online sources, including eBay and Amazon.com, plus the Teleflite web site: www.teleflite.com. You can contact the publisher at:

Teleflite Corporation
11620 Kitching St
Moreno Valley, CA 92557 USA