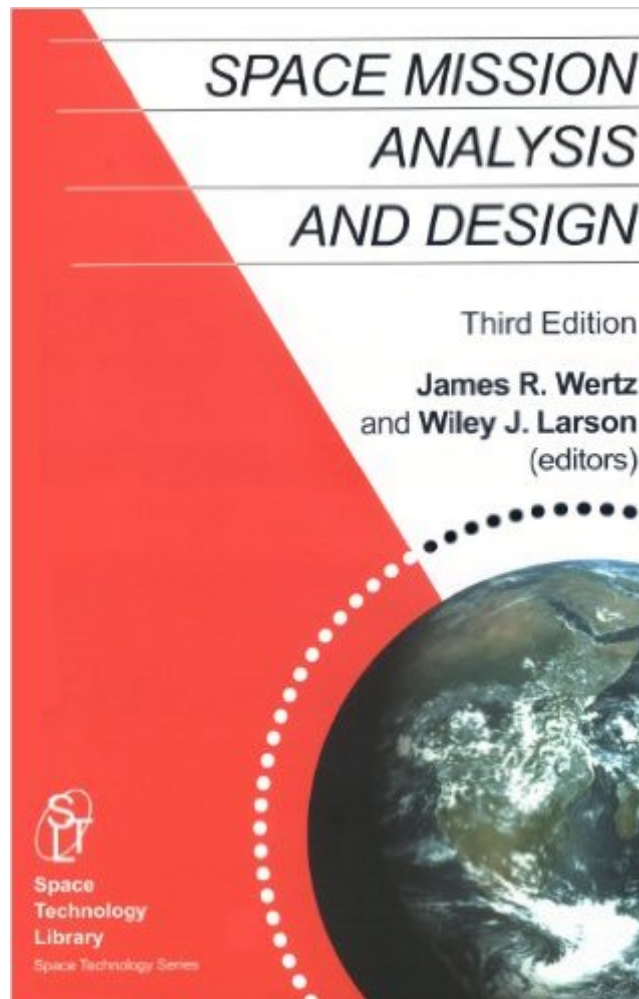


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# Space Mission Analysis And Design, 3rd Edition (Space Technology Library, Vol. 8)



## Synopsis

This practical handbook for Space Mission Engineering draws on leading aerospace experts to carry readers through mission design, from orbit selection to ground ops. SMAD III updates the technology, provides greater emphasis on small spacecraft design and the cost-reduction process, and includes more detail on multi-satellite manufacturing, space computers, payload design and autonomous systems.

## Book Information

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## Customer Reviews

I teach a Space Systems Engineering class and have used this book as a class text. I've found it to be both good and bad. On the good side, SMAD provides a very good overview of the satellite and mission design process. It's full of realistic and experience-based design information, and useful data and algorithms for sizing and costing. Especially useful are the "Process" tables, which map out the design process into several distinct steps. The book has its downsides, though. The various authors are usually far too verbose -- their points are often lost in the blizzard of words. The length of the book could be profitably cut by at least 100 pages. Also, the authors often come to the table with a distinct agenda, which leads them to say things which are not necessarily accurate. (See, e.g., Wertz's diatribes on autonomous orbit determination and maneuver planning -- the latter is almost a veiled advertisement for a software product being sold by Wertz's company.) The effect is to cut off consideration of other valid options. Finally, the book can be extremely uneven in the level

of technical knowledge required. For example, Chapter 9 (Payload Design) presupposes a tremendous amount of detailed knowledge of, say, optical payloads, to the effect that: if you knew all of the stuff required, you wouldn't need SMAD; and if you don't know the stuff, SMAD won't help you. Despite these problems, it is still a very good and useful book -- you just have to be careful sometimes in how you use it.

This book is the third edition of the author's previous work and is the collective writings from dozens of engineers who specialize in spacecraft systems design, space mission definition and operations and testing as well as a variety of other topics. While this book provides an excellent general overview of a variety of topics and the basics for designing and developing a space mission, more specialized materials are needed to develop specialized spacecraft systems, such as Guidance and Navigation. It is important to note that this book is geared to unmanned satellites and space probes and there is little material related to manned spaceflight. As someone who has worked in the aerospace industry for almost two decades, I found the book slightly lacking in several areas. In addition to the previously noted areas, I found that some of the contributing authors focused primarily their specific projects. Even with these minor faults, this book provides the reader or developer of space missions, with a comprehensive overview of all the pieces that are needed to develop a spacecraft for a space mission. Finally, it should be noted that this book is highly technical and not geared towards the casual reader who is interested general spaceflight.

This is essential reading for anyone who works in the field of spacecraft hardware regardless if it is at the component level or the spacecraft level. This book adequately presents an overview of each of the subsystems that comprise a spacecraft. Indeed much of these systems are similar for payloads as well just in a scaled down version. Information is provided in such a way as to efficiently teach how these subsystems interact with each other as well as how the requirements flow down from the top mission or science level requirements into the detailed functional and performance requirements. This book captures the interrelation of the programmatic requirements of budgets and schedules in helping define what technical solutions are implemented for the aforementioned mission or science requirements. This book will help all spacecraft managers get a top level view of various subsystems such that he or she can make adequate trade studies. This book will help the systems engineer communicate requirements across the subsystem interfaces. This book will help the subsystem and component level engineers understand how the interfaces of their work carry over throughout the spacecraft as well as to understand the inputs that go into their specific area.

The third edition falls short of the information provided in the second edition. The third edition lacks the detail on thermal radiation and conditions that was included in the second edition . ( see chapter 11.5). It appears to me that the 3rd edition is more a generalization and discussion, rather than providing a detail method of analysis for a space mission. If possible , I would like to return my copy of the 3rd edition for a copy of the second edition. Thank you. L. Rosenman

While it could be more detailed or better organized, this book is an anthology of useful information, reference data, and procedures. Just about anything an aerospace engineer could want to do is outlined in this book. Planning a mission to Mars? This book will give you an outline of most of the steps involved. Planning a satellite? This book will remind you of all the subsystem and mission architecture to consider, then give you scatterplots of previous mission parameters. This is a fun book just to flip through when I need to remind myself why I'm doing all this.

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