SMAD III

Space Mission Analysis and Design

Third Edition

edited by James R. Wertz, *Microcosm, Inc.*
Wiley J. Larson, *U.S. Air Force Academy*

This third edition of *Space Mission Analysis and Design*, known as SMAD to its many friends, carries on the tradition of the first two editions of providing a practical handbook for **Space Mission Engineering** — the process of defining mission parameters and refining requirements to meet the often fuzzy objectives of a space mission at minimum cost and risk. We begin the process with a "blank sheet of paper" and carry the reader through a preliminary mission design covering all system aspects: orbit and constellation design, mission geometry, launch vehicle selection, and design of the spacecraft, payload, ground segment, and operations. The book is a comprehensive presentation of theory and practice, drawing on the insight and practical knowledge of leading experts from all segments of the aerospace community.

SMAD III both updates the technology and provides a greater emphasis on the design of smaller spacecraft and the process of reducing cost.* It has been expanded to include more detail on multi-satellite manufacturing and the design and selection of constellation parameters. The discussion of space computers has been expanded and revised. The unmanned spacecraft cost model has been updated and the new Small Satellite Cost Model has been added. The discussion of payload design has been extensively revised and expanded. Discussions of electric propulsion, autonomous systems, on-board navigation, and the use of commercial PCs and COTS software have been expanded in keeping with current trends in system design. The appendices and tables have been made even more extensive and useful.

Because of its practical orientation, useful data and formulas, and process tables which summarize the design methodology of all major mission elements, SMAD has become the most widely used volume in astronautics. It is intended for both students and professionals in astronautics and space science. It is appropriate for engineers, scientists, and managers trying to obtain the best mission possible within a limited budget and for students working on advanced design projects or just beginning in space systems engineering. It is the indispensable traveling companion for seasoned veterans or those just beginning to explore the highways and by-ways of space mission engineering. Enjoy!

**Reducing Space Mission Cost*, a companion volume to SMAD also edited by Wertz and Larson, provides the most comprehensive discussion to date of this important aspect of modern mission design.

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