



Rocket Science

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Dedication and Foreword

This text is the second in a series to touch the area of rocketry. And it follows the many National Association of Rocketry and Tripoli Rocketry Association works I have prepared. It is up to you the reader to judge if it is worthy of your bookshelves. It is also meant to educate and enlighten the rocketeers, engineers and scientists growing up today and who are seeking the vast knowledge that resides in Aerospace Engineering and space flight.

Simply, you can become a rocket scientist using this book and a few other outstanding resources. This document will serve students, High Power and Model Rocketry designers and the hobbyist. It is also for those great teachers seeking to inspire students to be creative and learn in the sciences. If you have a handle on algebra and some physics, this text will take you the rest of the way. For teachers this book will demonstrate fundamentals your students will see again in college in their first two years of Engineering. And an early head start on those engineering fundamentals places you in the front of your class I might add. With a 31 year career in nuclear engineering, I have enjoyed and at times suffered from the hand of my instructors, I hope to put some of that experience in your hands as you read and apply this book.

Rocketry is not as difficult as the public would seem to think. “Gee that’s rocket science” kind of comments always make me chuckle, because I am a rocket scientist. If you are reading this, then you fall in that category of either being one or have that wonderful desire to become one. This book will support and aid you for years to come. We have a great trip to take in these pages and the methods apply all the way from model rocketry to the Space Shuttle.

In terms of dedication, I thank my best friend for keeping me on the path of space and rocketry. I am truly never happier than holding that launch controller and hearing the countdown. As my High School teacher who took an average student and gave him the thirst for science, Arne you gave my life a great send off.

I owe a deep debt from the following men in providing me the best hobby and fun I have every known. Harry Stine created model rocketry along with Orville Carlisle and Vern Estes in the late 1950’s. Some 46 years later, I was honored to be the engineering keynote speaker at the School of Aerospace Engineering at the University of Illinois talking on model and high power rocketry and how it has and will educate our young men and women.

I drove home after that night, with a few tears thinking, my God, I just got a standing ovation from 75 to 100 of the best minds in this country, God Bless Harry Stine ! You see, U of I was were I wanted to get my degree from, so being in front of that group was a real treat. Now I would like to give back to the students, teachers and rocketeers old and new. All within this textbook are the tools you can use today. Be your interest in propulsion, telemetry, computer programs, CAD or the like, we will go to all these places.

If you are a student trying to get a handle on aerodynamics, flight mechanics, electronics, stability and structures in rocketry design, this book will serve your needs and give you a foundation to build on. This is more than a hobby text that shows how to construct model and high power rockets, its the fundamentals that stand behind the craft as well.

A deep thanks to the dedicated staff at NASA. The many diagrams, images and programs shown, demonstrated and discussed here come from many years of research at NASA centers. The efforts of the NASA team is appreciated by the membership of both the NAR and TRA. To the membership of both the TRA and NAR, I sincerely hope this text will be an aid in your design efforts not only today but tomorrow.

Finally to Gordon Mandell, George Caporaso and Bill Bengen the writers of “Advanced Topics in Model Rocketry my deepest thanks for making the first book of rocket engineering in 1973. Your exceptional text and efforts are still noteworthy in 2009.

We are on the frontier, and each day is a new discovery!

Table of Contents

Introduction

Chapter 1	Propulsion	1
	High Power Rocket Basics	2
	Nozzle Theory and Thermodynamic Relationships	8
	Thrust Chambers	33
	Solid Rocket Motor Design	71
	Nuclear Rocket Propulsion	77
	VASMIR Plasma Drive	92
	Pump Theory	95
Chapter 2	Aerodynamics	102
	Rocket Aerodynamics (the Datcom method)	109
	Aerodynamics with the Panel Method	124
	Aerodynamics with the Vortex Lattice Method	134
	Base Drag	146
	Flight Determined Subsonic Characteristics	148
	The Descriptive Geometry of Nose Cones	173
Chapter 3	Flight Mechanics	187
	Rocket Static Stability under the Barrowman Method	188
	Flight Dynamics in Rockets	209
	Flight Mechanics for Model Rockets	211
	Flight Mechanics for Aircraft	222
Chapter 4	Guidance Design	251
	Development of a Sun Based Guidance System	252
	Rate Gyro's	277
	Response Curve of a Hobbico Rate Gyro	282
	Flight Dynamics Software for VTS	284
	Electronics for VTS	290
Chapter 5	Payloads and Telemetry	305
	Rocket Engine Vibration	306
	Turbomachinery	308
	System Loads	309
	ADEPT ROCKETRY	313
	PERFECTFLITE	329
	TRANSOLVE	334
	ROCKET VIDEO	337
	BOOSTER VISION CCD VIDEO SYSTEM	339
	Rocket Sound Payload	341
	A MAGNETIC APOGEE DETECTOR	344
	ROCKET RADIO TRANSMITTERS	347
	Rocket Strobe Light	372
Chapter 6	Structural Design	374
	Comet disasters of 1954	375
	CONSIDERING FLIGHT CONDITIONS	377
	UNDERSTANDING LOADS	380
	MATERIALS	380
	Composite Materials	386
	ADHESIVES	388

	THE IMPORTANCE OF WEIGHT CONTROL	390
	DYNAMIC FLIGHT CONDITIONS	391
	AIRCRAFT STRUCTURAL DESIGN	392
	Comments on the use of Composites	402
	BUCKLING IN VEHICLES NASA SP-8007	404
	FINITE ELEMENT MECHANICS AND SOFTWARE TOOLS	405
	Theory	408
	FinSim	419
Chapter 7	Radio Control	423
	Research Programs	427
	Basics of Radio Control	430
	GLIDE STABILITY	436
	BOOST STABILITY	440
	Configurations	443
	NASA TM H-2287	446
	Solving for the glide speed and sink rate	474
	VEHICLES	478
	Arcie II	478
	Estes Astro Blaster	484
	Estes Strato Blaster / T-25	485
	Sky King / Aerotech Phoenix by Bob Parks	486
	Space Shuttle	494
	George Gassaway XS-1	499
	X-15	507
	X-20	517
	The X-24A / X-38 with a Para-wing	526
	The X-33 / Venture Star	542
	Raptor III	553
Chapter 8	Software Applications	571
	Sub3D	573
	Compufoil for Windows	573
	AeroWindTunnel	573
	RockSim 9.0	577
	RASAero	577
	Structural Analysis (Finite Element Analysis)	588
	CFD, High Cost and PC Issues	590
	Orbiter	592
	TurboCad 3D	594
Chapter 9	High Power Rocketry Design	596
	High power building materials	597
	Nose cones	598
	Fins	598
	Construction Tools	599
	Thru-the-wall fin mounts	601
	Sizing the Parachute	603
	Shortening Delay Elements	604
	Motor Mounts	604
	Flight Failures	604
	Composite Reinforcement	610

	Painting	620
	Vendors	621
	Graphite Epoxy Composites	624
	Resins	627
Chapter 10	Aerothermodynamics	628
	Thermal Protection Materials	631
	ARMOR	634
	Aerodynamic Preferences	636
	Hypersonic Flow	637
	TEMPERATURE EFFECTS	638
	NEWTONIAN THEORY	639
	The Reusable Dyna Soar X-20	642
	The Reentry Problem	651
	Blunt body entry vehicles	654
	Shock layer gas physics	657
	Thermal protection systems	660
	Entry vehicle design considerations	665
Chapter 11	Orbital Mechanics	668
	A History if the Laws of Motion	669
	Orbital Motion	676
	Orbital Maneuvers	692
	Launch Considerations	696
	Deorbit and Decay	700
	Orbiter	701
Chapter 12	Organizations and Regulations	705
	The History of Model Rocketry	706
	The National Association of Rocketry	709
	NAR SAFETY CODE	711
	Tripoli Rocketry Association	713
	Motor Classes	719
	Tripoli Research Safety Code January 2009	719
	Significant Regulations	728
	FAA FAR Part 101	729
	SHIPPING SPORT ROCKET MOTORS	731
	NFPA 1127	733
	Appendix A The First Model Rocket	733
Chapter 13	On the Cutting Edge	739
	Propulsion	740
	Thermal Protection	742
	Recovery and Landing	744
	A Little History, Space Wedge	744
	Materials	748
	Star Booster and High Power Rocketry	751
	Delta Clipper	753
	SpaceX	756
	Living Off the Land, the Zurbín Principle	760
	What Lay Ahead, A Truly Odd Universe	762
	Ships, Captain we Need Ships	766
	Cosmology and WMAP, Finding the story of Creation	783
	The Role of COTS	788

	Project Orion	798
Chapter 14	Reusable Launch Vehicle Development	811
	The North American X-15	813
	The Lifting Bodies	824
	The X-20 Dyna Soar	826
	NASA Space Shuttle	831
	Shuttle Systems	839
	The Hope X	859
	X-33	863
	Space Wedge	866
	XCOR Lynx	870
	Scaled Composites Space Ship Two	875
	GRYPHON, A TSTO System to LEO	880
Chapter 15	References: Internet Sources and Books	887