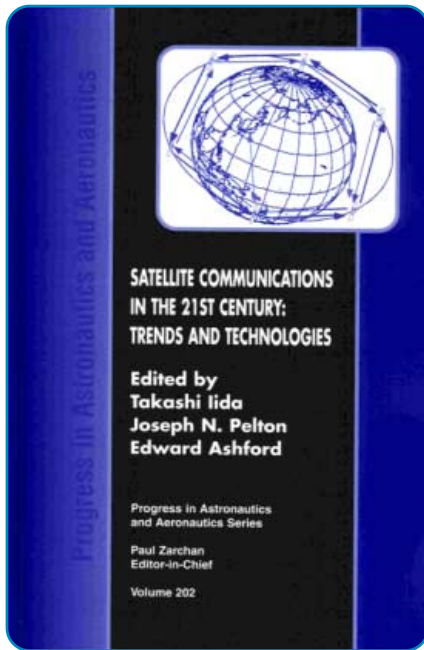


Book Reviews

by Mark Williamson



Satellite Communications in the 21st Century: Trends and Technologies, Takashi Iida, Joseph N Pelton & Edward Ashford (Eds), AIAA, 2003, 236pp, US\$84.95 (AIAA Members \$59.95) ISBN 1-56347-579-0 [hardback]

Satellite communications is the number-one commercial space application; it has been since the early days of the Space Age and it looks like remaining so for at least the early part of the 21st century. This book - part of the AIAA's 200-plus-title *Progress in Astronautics and Aeronautics* series - aims to summarise the current position of satcoms technology and look towards a difficult-to-predict future.

That this application is important to the space industry is without doubt: according to the book, expenditure related to satellite communications amounts to some \$75 billion per year and provides employment for more than 35,000 people worldwide. Many of them would find this book of interest, as will the students who may one day join their ranks. Both students and professionals are included in its target market.

The book itself is divided into seven chapters, which cover the basic principles of satcom systems, review broadband and mobile satellite applications, and look towards the future of satellite broadcasting. It is illustrated with line diagrams, computer-generated drawings and a few photographs, and also includes a minimal (three-page) index. Importantly, considering that this is a book on 21st century satellite communications, later chapters look at the tech-

ISR reviews books of interest to the space professional. Its policy is one of impartiality and honesty, so if a book has failings we believe should be brought to the attention of potential purchasers, we will do so. On the other hand, if it is useful, informative and entertaining, we will say so. In this way, we hope to provide a useful service to our readers.

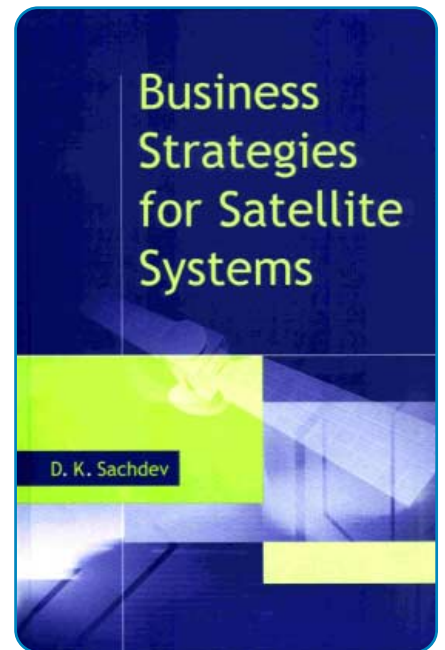
nology of 'next generation satellites' and the future of the satcoms field in the next 30 years. As the preface notes, satellite technology has been under development for the past 40 years and must continue to develop if the industry is to retain its ability to provide affordable services.

The authors – all expert in their field – have endeavoured to address their topic without recourse to large numbers of equations or technical jargon. So, although satellite communications is a highly technical subject, the way it is presented here should be accessible to a broad range of readers. For those requiring further detail, each chapter includes a reference list and a number of 'Questions for Discussion' (a nod to the volume's textbook nature). Some of the latter are, to say the least, thought-provoking: for example, "What special impact on the satellite industry could the continuing explosion of information worldwide provide? Could satellites play a special role in the creation of a 'worldwide mind', a global information exchange, or an 'always-on' global electronic university". It is fairly obvious that this chapter's author, Joe Pelton, believes the answers are yes, yes and yes! My favourite, however, is included in Ed Ashford's chapter on the principles of satellite communications: "Calculate your last salary increase in dBs".

Ashford further displays his sense of humour in a chapter on satellite broadcasting by reminding us of the witty versions of the three acronyms for TV-standards: the American NTSC (never the same colour); the broadly European PAL (pictures at last); and the characteristically French SECAM (system essentially contrary to America's method).

Certainly, the occasional light-hearted moment is welcome in a book so densely packed with information. The student who absorbs everything this one has to offer will be rewarded in their intellectual understanding of satellite communications...and possibly ultimately with a job!

Note: the author of this review made a small contribution to this book by reviewing a draft of chapter 2 and providing some of the diagrams. <<<



Business Strategies for Satellite Systems, D. K. Sachdev, Artech House, 2004, 260pp, £63.00 ISBN 1-58053-592-5 [hardback]

The failure of number of high profile satellite systems in the 1990s gave system designers pause for thought and brought about a virtual moratorium on funding for innovative satellite technologies. The failures – of Iridium and Globalstar to name the most famous culprits – were not technical failures, but business failures, and it is part of this book's remit to avoid a repetition and explain how satellite businesses should be run.

Its author is well qualified for the task, having spent almost two decades at Intelsat before moving on to WorldSpace, as senior vice president for engineering and operations, where he also contributed to the XM Radio system. He begins the book with a review of today's satellite business and 'lessons learned' as a result of experience, then tackles the meat of the subject of business strategy development. Later chapters cover business plans; system planning, engineering and operations; and a number of case studies in digital radio systems. As might be expected from a 'management book', the illustrations are largely confined to flow charts and simple system diagrams. Most chapters have a list of references and there is a nine-page index.

According to the author, the book does not claim to compete with other "excellent books" dedicated to satellite communications, strategy development and project management, but aims to "combine the essentials from all of these disciplines in one integrated process". In effect, then, it is like systems engineering, providing the glue which holds the disparate specialisations together. While the volume is targeted at management and engineering professionals, it is also, according to the author, intended

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as a single text that will save students buying multiple textbooks on various aspects of the satellite business.

This is, above all, a practical book, as shown by the list of eight 'lessons' covered in chapter 2, which include "if you are in a consumer business, start with the consumer" and "in good times and bad times, boring is often good". The first one is a criticism of technology-led satellite projects which have failed, for example, because the service was too expensive or required a brick-like mobile phone; the last is another way of saying the same thing. As the author writes, "If such a system appears 'boring' to technophiles, but makes the investors happy with sound returns, then so be it."

The bulk of the book is dedicated to what the author calls the integrated business strategy process (IBSP). Despite the verbosity of the phrase, the book presents a pragmatic how-to-do-it guide to business plans and strategies, which is – let's face it – largely common sense. The problem, of course, is that common sense is demonstrably far from common – in the satellite business and elsewhere – which is why books like this one are written, and needed.

The book contains the inevitable management jargon, but the text is interspersed with useful tips and anecdotes. A favourite is featured in a section on 'vision', which recalls a famous speech made by Martin Luther King in 1963 – the "I have a dream..." speech. The author describes it as a vision

statement which was "clear and focused on its objectives" but points out that its impact would have been lost if King had said instead "I have a strategic plan...". Evidently, there is a time for jargon, and a time to be clear.

Satellite engineers at all but the lowest levels should concern themselves with business and management issues, not only to ensure that their engineering designs make economic sense, but also to spot where their managers are making mistakes.

For those who realise they should read about the business side of satellite projects, but have been put off by books full of 'management-speak', this book will come as a relief.

If you read only one book on the subject, make it this one. <<<



Economic Principles Applied to Space Industry Decisions, Joel S Greenberg, AIAA, 2003, 494pp, US\$100.95 (AIAA Members \$69.95) ISBN 1-56347-607-X [hardback]

Space programmes and money are inseparable bedfellows. Indeed, the words themselves often occur in the same sentence, more often than not as part of a criticism that money has not been spent wisely, but sometimes as part of an argument that insufficient money has been allocated to a given programme. Far less frequently are the two subjects combined in a book which explains how they should interrelate and, as such, this volume is a welcome addition to the AIAA's *Progress in Astronautics and Aeronautics* series.

The author is clear in his introduction that this "is not an economics book", but "a book about the applications of economic principles and concepts in decision making related to space activities". This may well be true, but potential readers should be under no misunderstanding; it is written in the language of an economist, rather than

a technologist, and includes some pretty serious economics, statistics and business/financial jargon.

For example, according to the author, "An important aspect of the book is the use of multiattribute decision variables, and related databases, to characterize private sector investment decisions". So if this sort of language leaves you cold, the book probably isn't for you.

However, the author also states that his book is "primarily a tutorial", which implies that it is a way of delivering information and expertise to someone who is obliged to listen (the archetypal 'captive student'). Indeed, it has the feel of an academic tutorial, with sections which start with simple concepts and evolve into complex analyses. For example, one on "metrics" (or "yardsticks") starts with the unnervingly simplistic statement that "when shopping in a supermarket for chicken soup, many brands are encountered"; however, shortly thereafter it is talking about "cost estimating relationships" and "Monte Carlo techniques".

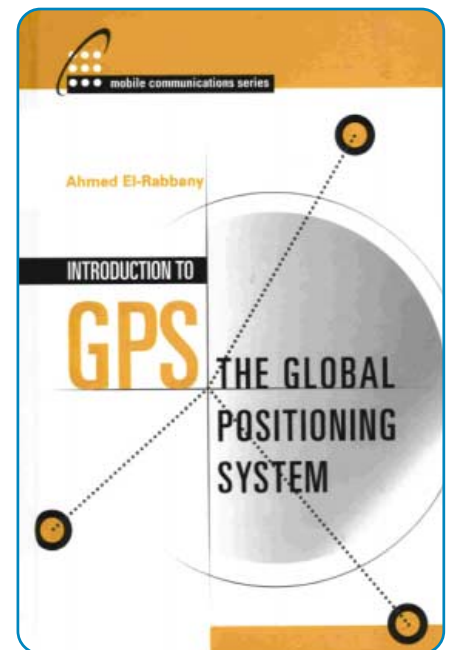
The key examples in the book are mostly space-related but the context is definitely economics.

Specifically, the book's six, long chapters (written largely in long, complex sentences) cover introductory topics, investment decisions, reusable launch vehicle economics, space operations, licensing and regulatory issues.

The volume concludes with an appendix on "Estimating the Likelihood of Investment" and a three-page index, and is illustrated with tables, graphs, bar charts and flow charts.

The final chapter - entitled "Beyond Space: Energy and Gaming" – includes, among other things, a discussion of card counters in Atlantic City casinos and the baccarat risk/reward model (not your usual space book then...).

As the title suggests, this has little to do with the space industry and seems like a pet topic the author could not bear to omit. In the final analysis, potential purchasers will have to decide for themselves whether the risk of investing just over \$100 in this book is likely to justify the reward of reading it. It's your call. <<<



Introduction to GPS – The Global Positioning System, Ahmed El-Rabbany, Artech House, 2002, 196pp, £41.00 ISBN 1-58053-183-0 [hardback]

Far from being some arcane and esoteric satellite application, GPS is now a household term. While the average man-in-the-street may not know what the abbreviation stands for, increasing numbers of 'ordinary citizens' know what the Global Positioning System can do for them, whether they are hiking in the hills or driving in their cars.

This book is aimed at GPS users who don't have either the time to read a mammoth textbook or an abiding interest in the mathematics which usually accompanies the subject. It starts with an overview of how the system works and moves forward briskly - in short, succinct chapters - to details of measurements, errors, coordinate systems and other technical aspects. Later chapters cover the integration of GPS with other systems, such as cellular communications and geographic information systems (GIS); GPS applications for anything from precision farming to seafloor mapping; and other sat-

ellite navigation systems, including the Russian Glonass, Chinese Beidou and European Galileo systems (though these sections are extremely brief). Each chapter has a reference list and the book concludes with a couple of brief appendices and a useful eight-page index.

Based on his experience in teaching GPS users and students, the author has developed what he calls "an easy-to-read, yet complete, GPS Book".

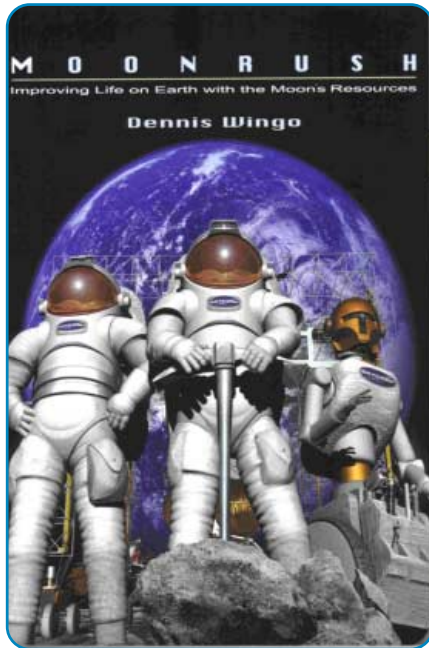
These are two laudable aims which deserve comment.

Is the book, as the author intends, easy to read? In the main, it is: although sometimes quite complex, the descriptions are concise and formulated to avoid excessive detail on each point.

The reader's understanding is enhanced throughout by a number of simple diagrams and pictures, so that someone new to GPS – yet keen to learn – would have little diffi-

culty in assimilating the contents.

Is it a "complete" book on GPS? Well, no, of course it isn't. It could hardly be expected to be complete, at 200 pages, when another publisher has produced a pair of 700-page tomes on the subject. But it is complete enough. Readers who need a 'GPS primer' need look no further, while those who want more after reading this book can go out and buy the doorstops from the other publisher. <<<



Moonrush – Improving Life on Earth with the Moon's Resources, Dennis Wingo, Apogee Books, Collectors Guide Publishing Inc (Canada), 2004, 264pp, US\$24.95; Can\$30.95; £17.95 ISBN 1-894959-10-8 [softback]

One shouldn't judge a book by its cover and it is often difficult to judge its content from the title, but this is a package which seems to put all its cards on the table in that initial image. The title – Moonrush – evokes the 'gold rush' which saw thousands of expectant migrants flocking to the western United States in search of wealth. The subtitle – Improving Life on Earth with the Moon's Resources – implies that this will involve mining the Moon to bring that wealth to Earth. And the cover illustration – which includes a pick-axe toting lunar miner – completes the can-do, gung-ho image of frontierism at its macho best.

The high octane delivery of this book continues with its publicity, which declares that it examines how "a commercial base on the Moon and Mars would transform our economies on the Earth as surely as the discovery of the New World transformed the old world of Europe". From "manufacturing high tech metals and robots to the building of a fusion reactor, the Moon holds great promise for a high tech manufacturing future", it continues, presaging the book's proselytising

tone.

The book itself is written in a conversational style which immediately involves the reader and, despite their technical nature, its arguments should be readily understandable by most readers. Whether they will agree with the author's opinions – that a lunar base can be built "at reasonable cost" and that industrial development of the Moon should be pursued without delay - is another matter. But that is up to the individual to decide.

The author's arguments are presented in 16 chapters, almost half of them concerned with energy generation (its history, future options and impact on civilisation). The second half of the book covers lunar prospecting, exploration and development and includes a review of 'lunar architectures' developed during three periods in space history (1953-72, 1972-88 and 1989-2003). Throughout, the author is not afraid to express his opinions, which is to be applauded, though he sometimes goes overboard in illustrating who he does and doesn't like. For example, former US vice president Al Gore's environmental treatise *Earth in the Balance* is mentioned for its "holocaust analogies and quasi-religious metaphors", while John Lewis's book *Mining the Sky* is characterised as "incredible" and "brilliantly thought...out".

Whether you are in the author's gang or not, you have to be impressed with the

way he maintains the momentum of the book to the end, where, among other things, he makes a familiar comparison between the way NASA and the new entrepreneurs 'do space'. At one point he highlights the ethic of the Silicon Valley generation with a photograph labelled "Microsoft Corporation 1978" - a group of 11 individuals just out of the hippy era. Apparently it was used with the caption "would you invest in this company?"; in explaining why that period marked a revolution, the author tells us that the subjects "have a cumulative net worth close to 100 billion dollars".

The book's illustrations occupy both ends of the quality spectrum: from the superb reproduction of the centrally bound colour plates to the blurry indifference of some of the diagrams. The biggest failing of the book, however, is its lack of an index...and to borrow the author's forthrightness, this is unforgivable. A book as wide-ranging as this one – covering anything from terrestrial nuclear fusion to Wernher von Braun's spacecraft designs – desperately needs an index.

How else is the interested reader, having carefully read and absorbed the author's thoughts and opinions, ever to find them again – short of re-reading the book from cover to cover?

If a second edition is ever commissioned, I hope the publisher will insist on the addition of a suitable index. <<<

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