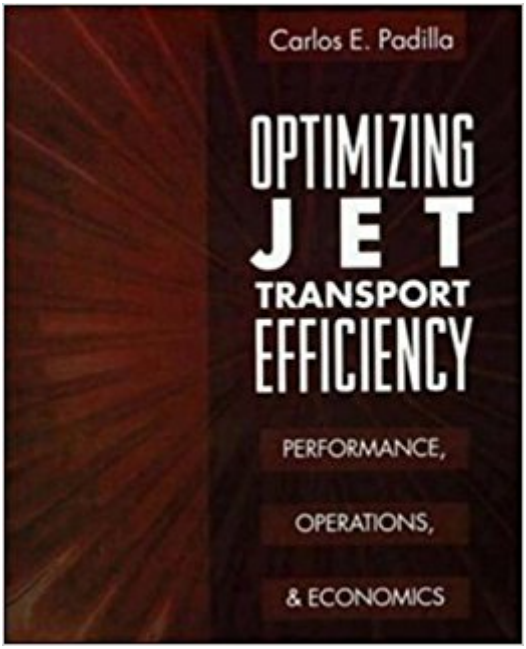
Optimizing Jet Transport Efficiency: Performance, Operations, And Economics



Synopsis

Operate a jet transport fleet profitably, safely, and legally with this indispensable reference to assessment, performance-related FAA restrictions, and legal and economic issues. Written by a senior performance engineer with America West, it is a unique source of experienced advice combined with research on issues of technology, personnel management, dealing with government regulations, and more.

Book Information

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Customer Reviews

The definitive professional’s reference to jet transport safety, efficiency, and profitability Modeled on airline training courses, this groundbreaking book thoroughly explores the driving maxim of jet transport design and engineering--carry as much weight as possible as far as possible as fast as possible at the greatest profit possible. Experienced performance engineer Carlos Padilla examines the key concepts and methods being used by today’s TMS successful industry players to achieve this important goal. This extensively researched volume provides you with important insights and heard-to-find information gained only through experience, including comprehensive explanations of performance issues related to jet operations. Featuring helpful lists and explanations of abbreviations and relevant terminology, this authoritative manual is also filled with example problems and solutions. Inside, you will find concise examinations of: Challenges arising from cockpit automation; Development of payload-range curves; Cost index and economy speeds; Calculations for weight and balance; Performance-related FAA restrictions: Propulsion systems and

thrust setting parameters. The competitive environment of the airline industry, makes this book a vital resource for professionals working in the jet transport environment.

McGraw-Hill authors represent the leading experts in their fields and are dedicated to improving the lives, careers, and interests of readers worldwide

This book does a good job filling the gap between the 'academic' aircraft performance texts and the real-world airline performance engineering.The first five chapters are preparatory in nature, and are unfortunately mostly mundane reading for me. The part about aerodynamics contains some especially low quality figures that do little in illustrating terms such as boundary layer, stall, separation, or shockwave. The pressure distribution plot and the shockwave-induced separation border on being comical in the eyes of any aerodynamicist. My experience with academic performance texts is that they sometimes contain, unnecessarily, too much introductory aerodynamics. In this case, there is a risk of misleading an uninitiated reader and I personally recommend consulting any of a plethora of standard aerodynamic texts to get the facts right.Things only get interesting after chapter six. Readers who have previously only studied academic texts may be excited about topics such as wind effects on turning radius, ECON climb, ECON cruise, Cost Index, and drift down. Although the author often has to use 'strong' simplification in order to keep the mathematics manageable, his results are nevertheless enlightening. A word of advice though: the serious reader should try to derive the equations himself and beware of typos. Typos, I guess, are just unavoidable in a technical book that rarely gets updated. There are also a few technical errors. The author claims in the descent chapter that rate of descent is negatively correlated to weight. He mentions that this defies intuition and it really does contradict my experience. Assuming an airframe loaded differently to obtain different wingloading, the optimum gradient is fixed while the speed to obtain that optimum gradient increases with wingloading. The fact that in the example that follows, increasing weight is correlated to decreasing rate of descent merely means the author is investigating one side of the lift-over-drag versus lift coefficient curve. Differentiating drag-over-lift w.r.t Cl, one finds that the optimum gradient occurs at cl=0.63, and the tabulated data in the following page only covers the 0.2~0.4 range which is sadly only one side of the curve. It is easy to find that rate of descent at cl=0.7 equals to 2098fpm which is higher than 2023fpm at cl=0.63. This clearly indicates that past 0.63 any increase in weight results in Increase of rate of descent. I do admit though that for speed stability reasons the higher Cl range is probably avoided in real life. As for his mentioning of gliders, I think it's misleading. Carrying ballast has a similar effect as

mentioned above in that the optimum gradient is retained albeit at a higher speed. This improves thermos to thermos transit and allows least loss of altitude for the same transit distance. However the rate of descent is definitely higher. Note that in this case the pilot is wise to follow that higher best speed otherwise the advantage would be gone.Interested Readers should also consult performance materials from manufacturers to gain a deeper insight into practical airline performance engineering. Overall the book is interesting enough. I recommend it because there just aren’t many titles that fills the niche mentioned as well as this book does.

According to Mr. Padilla, this book "is a compilation of some of the concepts and tools used by performance engineers in the analysis of airline-related performance problems." Basic concepts are presented about "carrying as much weight as possible, as far as possible, as fast as possible, at the greatest profit."This ’technical operations manual’ provides an excellent illustration into areas drawing from all pertinent disciplines: aerodynamics, propulsion, mechanics and restrictions.There are many mathematical equations but it is presented in a very concise format. I agree with the author that this book "would fit well at the second-year level of a standard engineering curriculum." As long as the reader understands algebra, trigonometry, and some elementary calculus, the material should be a ’touch and go.’However, I was never a whiz at mathematics, so it took me a little longer to figure it out without a dozen professors nearby. If you are like me, don’t be timid. The presentation is clear enough to gain a foothold and establish a critical bridge into the more sophisticated concepts, terminologies and technologies.

Excellent performance topics. Good material for aviators.

Very nice....much more than I expected! The book is very good! Very professional! I definitely recommend it. Thank you very much!

As a professor of aeronautical science in a large aviation oriented college program, I had been searching for a text which covered the economic aspects of airplane performance. The author does a wonderful job covering subjects such as the "cost index" and how it relates to economic climb and economic cruise conditions. The mathematics is very basic and should be understood by persons having taken algebra and perhaps introductory physics. This is the only text that I found that goes beyond the standard performance type topics in the direction of cost impact upon operations. The book would be excellent reading for aviation professionals or students of aviation. Great book!

As a manager for a regional airline fuel savings program, this book is a valuable reference for me. I am a pilot with an operational knowledge of performance engineering, and this book is able to bridge the gap between my flight operational knowledge and the engineering behind fuel economy.Many thanks for writing it!

Overall, this book does a great job explaining flight dynamics and associated cost. Even those without an extensive engineering background will be able to apreciate and learn from this book.

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