

Cambridge University Press

978-1-107-51122-4 - Jet Propulsion: A Simple Guide to the Aerodynamics and Thermodynamic Design and Performance of Jet Engines

Nicholas Cumpsty and Andrew Heyes

Table of Contents

[More information](#)

## CONTENTS

<i>Preface</i>	vii
<i>Glossary</i>	xi
<i>Nomenclature</i>	xiii
<b>Part 1 Design of Engines for a New Efficient Aircraft</b>	
1 The New Efficient Aircraft: Requirements and Background	3
2 The Aerodynamics of the Aircraft	20
3 The Creation of Thrust in a Jet Engine	34
4 The Gas Turbine Cycle	41
5 The Principle and Layout of Jet Engines	58
6 Elementary Fluid Mechanics of Compressible Gases	70
7 Selection of Fan Pressure Ratio, Specific Thrust and Bypass Ratio	82
8 Dynamic Scaling and Dimensional Analysis	99
9 Turbomachinery: Compressors and Turbines	114
10 Overview of the Civil Engine Design	137
<b>Part 2 Engine Component Characteristics and Engine Matching</b>	
11 Component Characteristics	143
12 Engine Matching Off-Design	175
<b>Part 3 Design of Engines for a New Fighter Aircraft</b>	
13 A New Fighter Aircraft	219
14 Lift, Drag and the Effects of Manoeuvring	230
15 Engines for Combat Aircraft	242
16 Design Point for a Combat Engine	262
17 Combat Engines Off-Design	284
18 Turbomachinery for Combat Engines	305
<b>Part 4 A Return to the Civil Transport Engine</b>	
19 A Return to the Civil Transport Engine	311
20 To Conclude	330
<b>Appendix: Noise and Its Regulation</b>	335
<i>Bibliography</i>	343
<i>References</i>	347
<i>Index</i>	349
<i>Design Sheet for New Efficient Aircraft</i>	352
<i>Design Sheet for New Fighter Aircraft</i>	353