



Mastering Rebreathers

Jeffrey E. Bozanic



Contents

Dedication	VII
Preface	IX
Foreword	XIII
Acknowledgements	XVII
Credits	XXI
About the Author	XXIII
Your Responsibilities as a Rebreather Diver	XXV
Disclaimer	XXVII
Chapter 1 Introduction	1
Chapter 2 History	17
Early Concepts	19
Rebreathers at War	22
Post War Developments	26
Commercial Applications	28
Chapter 3 Types of Rebreathers	37
An Overview of the Types and Classifications	39
Oxygen Closed-Circuit Rebreathers	40
Semi-Closed Circuit Rebreathers	41
Constant Mass Flow	43
Respiratory Minute Volume Keyed (Quasi-Constant FO_2)	43
Constant Ratio (Quasi-Constant PO_2)	44
Electronically Controlled	45
Longer, Quieter Dives	45
Mixed Gas Closed-Circuit Rebreathers	45
Choosing a Rebreather – Criteria	48
Chapter 4 Diving Physics	57
Pressure and Depth	59
Pressure and Volume	62
Breathing Gas Composition	64
Maximum Operating Depth	66
Equivalent Air Depth	68
Gas Consumption	70
Cylinder Gas Volumes	75
Summary	77
Chapter 5 Physiology	81
Oxygen Metabolism	83
Oxygen Exposure	85
Hypoxia	87
CNS Oxygen Toxicity	89
Pulmonary Oxygen Toxicity	94
Hyperoxic Myopia	98
Hypercapnia	99
Decompression Sickness	101
Inert Gas Narcosis	101
Arterial Gas Embolism	103
Squeezes	104

Chapter 13 Travel	277
General Travel Hints	279
Travel by Automobile	279
Travel by Boat	280
Travel by Plane	281
While Away From Home	282
International Travel	284
Common Sense	286
Chapter 14 Where Do You Go From Here?	289
Keep Diving	290
Future Training	293
Staying Current	294
The Adventure Continues	295
Rebreather Supporters	297
Appendices	321
Appendix A — Table of Appendices	321
Appendix B — Dive Tables	325
Appendix C — Dräger	357
Appendix D — Halcyon	405
Appendix E — Innerspace Systems	417
Appendix F — Olympic Submarine Technologies	423
Appendix G — San O Sub	431
Appendix H — Steam Machines	437
Appendix I — OCEANx Calculator	467
Appendix J — Rebreather Damage/Failure Report	473
Appendix K — Documentation/Regulations	477
Appendix L — References	503
Appendix M — Glossary	507
Appendix N — Index	527

