



# 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
<b>Chapter 1 Introduction</b> .....	1
<b>Chapter 2 History</b> .....	17
Early Concepts .....	19
Rebreathers at War .....	22
Post War Developments .....	26
Commercial Applications .....	28
<b>Chapter 3 Types of Rebreathers</b> .....	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 <sub>2</sub> ) .....	43
Constant Ratio (Quasi-Constant PO <sub>2</sub> ) .....	44
Electronically Controlled .....	45
Longer, Quieter Dives .....	45
Mixed Gas Closed-Circuit Rebreathers .....	45
Choosing a Rebreather – Criteria .....	48
<b>Chapter 4 Diving Physics</b> .....	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
<b>Chapter 5 Physiology</b> .....	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

<b>Chapter 13 Travel</b> .....	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
<b>Chapter 14 Where Do You Go From Here?</b> .....	289
Keep Diving .....	290
Future Training .....	293
Staying Current .....	294
The Adventure Continues .....	295
<b>Rebreather Supporters</b> .....	297
<b>Appendices</b> .....	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

