CONTENTS

Foreword *xv*

Preface to the Fourth Edition *xix*

Acknowledgments *xxiii*

Chapter 1: Your Role on the Game Development Team **1**

"You Get Paid to Play Games?" 1

Elements of a Game Development Team 2

Programmers 2

Artists 3

Animators 3

Level Designers 4

Sound Designers 4

Game Designers 5

Producers 5

Testers 6

Putting It All Together 7

The Game Production Cycle 8

Concept Development 8

Development 14

Alpha 15

Beta 15

Code Lock 17

	Gold	17
	Patches	17
	Updates	17
	Ready, Tester One?	18
	Exercises	18
	Reference	18
Chapter 2:	**The Basics of Game Testing**	**19**
	Not All Players Are Alike	20
	Black Box Testing	21
	White Box Testing	22
	Your First Test Suite	24
	Writing Test Cases and Test Suites	28
	The Life Cycle of a Build	30
	The Testing Feedback Loop	32
	The Essence of a Bug Report	32
	Testing "Around" a Bug	32
	Not All Testers Are Alike	34
	Exercises	36
	References	36
Chapter 3:	**Bug Report Writing and Defect Tracking**	**37**
	How to Write a Bug Report	37
	Just the Facts, Please	38
	The Brief Description	39
	The Full Description	40
	Great Expectations	42
	Habits to Avoid	44
	Using the Bug Database	45
	Category	46
	Summary	46
	(Full) Description	46
	Severity	47
	Priority	47

	Attachments and Recordings	48
	Other Database Fields	48
	Exercises	51
	References	51
Chapter 4:	**How Bugs Happen**	**53**
	Who Cares?	54
	Defect Types	54
	Functions	56
	Assignments	58
	Checking	60
	Timing	61
	Build/Package/Merge	62
	Algorithms	66
	Documentation	69
	Interfaces	71
	Testing Happens	73
	Exercises	74
	References	76
Chapter 5:	**The Phases of Game Quality Assurance**	**77**
	Pre-Production	78
	Planning Tasks	78
	Determine the Scope of Testing the Project Will Require	79
	Assign a Lead Tester	81
	Establish Milestone Acceptance Criteria	81
	Participate in Game Design Reviews	82
	Set Up the Defect Tracking Database	83
	Draft Test Plans and Design Tests	85
	Testing Before Testing Begins	86
	Test Kickoffs	87
	Configuration Preparation	94
	Smoke Testing	96

	Alpha Testing	96
	Alpha Phase Entry Criteria	97
	Regression Testing	98
	Beta Testing	100
	Beta Phase Entry Criteria	100
	Design Lock	101
	Living with Bugs (For Now)	102
	"The Swing Set of Death"	103
	Patches, Updates, and Hotfixes	104
	Gold Testing	105
	Last-Minute Defects	106
	Release Certification	107
	Post-Release Testing	107
	Live Teams	108
	Exercises	110
	Reference	110
Chapter 6:	**Exploratory Testing and Gameplay Testing**	**111**
	Ad Hoc Testing	111
	Free Testing Comes from the Right Side of Your Brain	112
	"Fresh Eyes"	112
	Directed Testing Makes Order Out of Chaos	114
	If You Are Not Recording, You Are Not Testing	115
	Avoid Groupthink	117
	Testing as Detective Work	118
	The Benefits of Reproduction	119
	The Scientific Method	121
	Gameplay Testing	122
	A Balancing Act	122
	"It's Just a Suggestion"	125
	Making a Game Easy is Hard Work	126
	External Testing	127

Who Decides? 130
Exercises 130
References 131

Chapter 7: The Two Rules of Test Management 133
Rule One: Do Not Panic 133
Unfamiliar 134
Unprepared 134
Under Pressure 135
Unrested 136
"Nearsighted" 138
Rule Two: Trust No One 138
Balancing Act 139
Word Games 139
Last Chance 140
Trust Fund 141
Managing Crunch Time 141
Give and Take 143
The Rest of the Story 144
Exercises 145
Reference 145

Chapter 8: Combinatorial Testing 147
Parameters 147
Values 148
Defaults 148
Enumerations 149
Ranges 149
Boundaries 150
Constructing Tables 152
Combinatorial Templates 172
Combinatorial Test Generation 175
Combinatorial Economics 179
Exercises 180

Chapter 9:	**Test Flow Diagrams**	**181**
	TFD Elements	181
	Events	182
	Actions	182
	States	183
	Primitives	183
	Terminators	183
	TFD Design Activities	183
	Preparation	184
	Allocation	184
	Construction	184
	A TFD Example	186
	Data Dictionary	192
	Data Dictionary Application	192
	Data Dictionary Reuse	192
	Data Dictionary Example	193
	TFD Paths	197
	Minimum Path Generation	197
	Baseline Path Method	198
	Expert Constructed Paths	200
	Combining Path Strategies	202
	Producing Test Cases from Paths	203
	TFD Templates	207
	When Should You Create a TFD?	208
	Exercises	209
Chapter 10:	**Cleanroom Testing**	**211**
	Usage Probabilities	212
	Mode-Based Usage	212
	Player-Type Usage	213
	Real-Life Usage	215
	Cleanroom Test Generation	215
	Cleanroom Combinatorial Tables	216

	Cleanroom Combinatorial Examples	218
	TFD Cleanroom Paths	224
	TFD Cleanroom Path Example	225
	Flow Usage Maintenance	228
	Flow Usage Profiles	229
	Inverted Usage	231
	Calculating Inverted Usage	232
	Combinatorial Table Usage Inversion	233
	TFD Flow Usage Inversion	234
	Exercises	238
	References	238
Chapter 11:	**Test Trees**	**239**
	Test Case Trees	239
	Tree Feature Tests	242
	Test Tree Designs	247
	Exercises	255
Chapter 12:	**Defect Triggers**	**257**
	Operating Regions	257
	Pre-Game Operating Region	257
	Game Start Operating Region	258
	In-Game Operating Region	258
	Post-Game Operating Region	259
	The Triggers	259
	The Configuration Trigger	259
	The Startup Trigger	261
	The Exception Trigger	262
	The Stress Trigger	263
	The Normal Trigger	263
	The Restart Trigger	264
	Classifying Defects	264
	Defect Triggers and Test Designs	267

	Combinatorial Design Trigger Examples	268
	TFD Trigger Examples	274
	Exercises	281
	Reference	282
Chapter 13:	**Regression Testing and Test Reuse**	**283**
	Regression Testing	283
	The A-B-C Method	283
	Defect Modeling	286
	Time Keeps on Ticking	289
	Expanding Possibilities	291
	Test Reuse	292
	TFD Design Patterns	293
	Looking Back and Forth	297
	Combinatorial Expansion	298
	Exercises	306
	Reference	306
Chapter 14:	**Testing by the Numbers**	**307**
	Testing Progress	307
	Testing Effectiveness	311
	Tester Performance	314
	Exercises	317
Chapter 15:	**Software Quality**	**319**
	Game Quality Factors	320
	Game Quality Appraisal	321
	Walkthroughs	322
	Reviews	324
	Checklist-based Reviews	324
	Inspections	325
	Game Standards	327
	User Interface Standards	328
	Coding Standards	329

Game Quality Measurements 331
Six Sigma Software 331
Phase Containment 333
Quality Plans 337
QA Personnel 337
Standards 338
Reviews and Audits 338
Feedback and Reports 339
Problem Reporting and Corrective Action 340
Tools, Techniques, and Methods 340
Supplier Control 343
Training 344
Risk Management 344
Exercises 345
References 345

Appendix A: Odd-Numbered Answers to Exercises 347

Chapter 1 — Your Role on the Game Development Team 347
Chapter 2 — The Basics of Game Testing 347
Chapter 3 — Bug Report Writing and Defect Tracking 348
Chapter 4 — How Bugs Happen 348
Chapter 5 — The Phases of Game Quality Assurance 348
Chapter 6 — Exploratory Testing and Gameplay Testing 349
Chapter 7 — The Two Rules of Test Management 349
Chapter 8 — Combinatorial Testing 349
Chapter 9 — Test Flow Diagrams 352
Chapter 10 — Cleanroom Testing 353
Chapter 11 — Test Trees 354
Chapter 12 — Defect Triggers 355
Chapter 13 — Regression Testing and Test Reuse 356

	Chapter 14 — Testing by the Numbers	358
	Chapter 15 — Software Quality	359
Appendix B:	**Sample Test Suite: RTS Building Checklist**	**361**
Appendix C:	**Basic Test Plan Template**	**371**
	Section I: QA Team (and areas of responsibility)	371
	Section II: Testing Procedures	372
	Section III: How Testing Requirements are Generated	376
	Section IV: Bug Tracking Software	376
	Section V: Bug Classifications	376
	Section VI: Bug Tracking	376
	Section VII: Scheduling and Loading	377
	Section VIII: Equipment Budget and Costs	377
Appendix D:	**Combinatorial Test Templates**	**379**
	Tables of Parameters with Two Test Values	379
	Tables of Parameters with Three Test Values	382
Appendix E:	**Test Flow Diagram (TFD) Templates**	**389**
	Power-Ups	389
	Craft Item	390
	Heal Character	391
	Create/Save	391
	Unlock and Buy Item	392
	Update Song List	393
	Complete a Mission or Quest	394
	Get Weapon and Ammo	395
Glossary		**397**
Index		**401**