

CONTENTS

PREFACE	xi
CHAPTER ONE / PROPOSITIONAL MODAL LOGIC	1
1.1 What is a Modal?	2
1.2 Can There Be a Modal Logic?	3
1.3 What Are The Formulas?	5
1.4 Aristotle's Modal Square	7
1.5 Informal Interpretations	8
1.6 What Are the Models?	11
1.7 Examples	14
1.8 Some Important Logics	18
1.9 Logical Consequence	21
1.10 Temporal Logic	24
1.11 Epistemic Logic	28
1.12 Historical Highlights	32
CHAPTER TWO / TABLEAU PROOF SYSTEMS	46
2.1 What Is a Proof	46
2.2 Tableaus	47
2.3 More Tableau Systems	51
2.4 Logical Consequence and Tableaus	55
2.5 Tableaus Work	57
CHAPTER THREE / AXIOM SYSTEMS	67
3.1 What Is an Axiomatic Proof	67
3.2 More Axiom Systems	71
3.3 Logical Consequence, Axiomatically	73
3.4 Axiom Systems Work Too	74
CHAPTER FOUR / QUANTIFIED MODAL LOGIC	81
4.1 First-Order Formulas	81
4.2 An Informal Introduction	83
4.3 Necessity De Re and De Dicto	85
4.4 Is Quantified Modal Logic Possible?	89

4.5	What the Quantifiers Quantify Over	92
4.6	Constant Domain Models	95
4.7	Varying Domain Models	101
4.8	Different Media, Same Message	105
4.9	Barcan and Converse Barcan Formulas	108
CHAPTER FIVE / FIRST-ORDER TABLEAUS		116
5.1	Constant Domain Tableaus	116
5.2	Varying Domain Tableaus	118
5.3	Tableaus Still Work	121
CHAPTER SIX / FIRST-ORDER AXIOM SYSTEMS		132
6.1	A Classical First-Order Axiom System	132
6.2	Varying Domain Modal Axiom Systems	135
6.3	Constant Domain Systems	136
6.4	Miscellany	138
CHAPTER SEVEN / EQUALITY		140
7.1	Classical Background	140
7.2	Frege's Puzzle	142
7.3	The Indiscernibility of Identicals	145
7.4	The Formal Details	149
7.5	Tableau Equality Rules	150
7.6	Tableau Soundness and Completeness	152
7.7	An Example	159
CHAPTER EIGHT / EXISTENCE AND ACTUALIST QUANTIFICATION		163
8.1	To Be	163
8.2	Tableau Proofs	165
8.3	The Paradox of NonBeing	167
8.4	Deflationists	169
8.5	Parmenides' Principle	172
8.6	Inflationists	175
8.7	Unactualized Possibles	178
8.8	Barcan and Converse Barcan, Again	180
8.9	Using Validities in Tableaus	182
8.10	On Symmetry	185
CHAPTER NINE / TERMS AND PREDICATE ABSTRACTION		187
9.1	Why constants should not be constant	187
9.2	Scope	190

9.3	Predicate Abstraction	194
9.4	Abstraction in the Concrete	195
9.5	Reading Predicate Abstracts	200
CHAPTER TEN / ABSTRACTION CONTINUED		204
10.1	Equality	204
10.2	Rigidity	210
10.3	A Dynamic Logic Example	216
10.4	Rigid Designators	217
10.5	Existence	220
10.6	Tableau Rules, Varying Domain	221
10.7	Tableau Rules, Constant Domain	227
CHAPTER ELEVEN / DESIGNATION		230
11.1	The Formal Machinery	231
11.2	Designation and Existence	233
11.3	Existence and Designation	235
11.4	Fiction	241
11.5	Tableau Rules	245
CHAPTER TWELVE / DEFINITE DESCRIPTIONS		248
12.1	Notation	248
12.2	Two Theories of Descriptions	249
12.3	The Semantics of Definite Descriptions	253
12.4	Some Examples	255
12.5	Hintikka's Schema and Variations	261
12.6	Varying Domain Tableaus	265
12.7	Russell's Approach	273
12.8	Possibilist Quantifiers	275
REFERENCES		277
INDEX		283