

Contents

Part 1: General Theory

Chapter 1. Rickart \ast -Rings, Baer \ast -Rings, AW^* -Algebras: Generalities and Examples	3
§ 1. \ast -Rings	3
§ 2. \ast -Rings with Proper Involution.	10
§ 3. Rickart \ast -Rings	12
§ 4. Baer \ast -Rings	20
§ 5. Weakly Rickart \ast -Rings	27
§ 6. Central Cover	33
§ 7. Commutative AW^* -Algebras.	40
§ 8. Commutative Rickart C^* -Algebras	44
§ 9. Commutative Weakly Rickart C^* -Algebras.	48
§ 10. C^* -Sums	52
Chapter 2. Comparability of Projections	55
§ 11. Orthogonal Additivity of Equivalence	55
§ 12. A General Schröder-Bernstein Theorem	59
§ 13. The Parallelogram Law (P) and Related Matters	62
§ 14. Generalized Comparability	77

Part 2: Structure Theory

Chapter 3. Structure Theory of Baer \ast -Rings.	87
§ 15. Decomposition into Types	88
§ 16. Matrices	97
§ 17. Finite and Infinite Projections	101
§ 18. Rings of Type I; Homogeneous Rings	110
§ 19. Divisibility of Projections in Continuous Rings.	119
Chapter 4. Additivity of Equivalence	122
§ 20. General Additivity of Equivalence	122
§ 21. Polar Decomposition	132

Chapter 5. Ideals and Projections	136
§ 22. Ideals and p -Ideals	136
§ 23. The Quotient Ring Modulo a Restricted Ideal	142
§ 24. Maximal-Restricted Ideals, Weak Centrality	146

Part 3: Finite Rings

Chapter 6. Dimension in Finite Baer $*$ -Rings	153
§ 25. Statement of the Results	153
§ 26. Simple Projections	154
§ 27. First Properties of a Dimension Function	160
§ 28. Type I_{fin} : Complete Additivity and Uniqueness of Dimension	165
§ 29. Type I_{fin} : Existence of a Dimension Function.	166
§ 30. Type II_{fin} : Dimension Theory of Fundamental Projections	170
§ 31. Type II_{fin} : Existence of a Completely Additive Dimension Function	178
§ 32. Type II_{fin} : Uniqueness of Dimension.	180
§ 33. Dimension in an Arbitrary Finite Baer $*$ -Ring with GC .	181
§ 34. Modularity, Continuous Geometry	184
Chapter 7. Reduction of Finite Baer $*$ -Rings.	186
§ 35. Introduction	186
§ 36. Strong Semisimplicity.	186
§ 37. Description of the Maximal p -Ideals of A : The Problem .	188
§ 38. Multiplicity Analysis of a Projection	189
§ 39. Description of the Maximal p -Ideals of A : The Solution .	191
§ 40. Dimension in A/I	193
§ 41. A/I Theorem: Type II Case	195
§ 42. A/I Theorem: Type I_n Case	196
§ 43. A/I Theorem: Type I Case	199
§ 44. Summary of Results	201
§ 45. A/M Theorem for a Finite $AW*$ -Algebra	202
Chapter 8. The Regular Ring of a Finite Baer $*$ -Ring	210
§ 46. Preliminaries	210
§ 47. Construction of the Ring C	213
§ 48. First Properties of C	218
§ 49. C has no New Partial Isometries	223
§ 50. Positivity in C	224
§ 51. Cayley Transform	227

§ 52. Regularity of \mathbf{C}	232
§ 53. Spectral Theory in \mathbf{C}	238
§ 54. \mathbf{C} has no New Bounded Elements.	243
Chapter 9. Matrix Rings over Baer \ast -Rings	248
§ 55. Introduction	248
§ 56. Generalities	250
§ 57. Parallelogram Law and Generalized Comparability	254
§ 58. Finiteness	256
§ 59. Simple Projections	257
§ 60. Type II Case.	259
§ 61. Type I Case	260
§ 62. Summary of Results	262
Hints, Notes and References	264
Bibliography	287
Supplementary Bibliography.	291
Index.	293