

TABLE OF CONTENTS

PREFACE	IX
ACKNOWLEDGEMENTS	XII
CROSS REFERENCES FOR THE CHAPTERS IN THE PARKE SELECTED BIBLIOGRAPHY	XIII

PART I / INTRODUCTION

1. BASIC PROBLEMS OF ABSTRACT CODING THEORY by W. E. Hartnett	3
1. The Setting for the Study	3
2. Models	6
3. The Setting for the Definitions	9
4. Definitions	10
5. A Guide to the Book	12
2. BASIC PROPERTIES OF ERROR-CORRECTING CODES by L. Calabi and L. K. Arquette	17
1. Introduction	17
2. Description of the Error Patterns	19
3. Correcting Ability and Decodability	22
4. Synchronizability and Comma-Freedom	28

PART II / THEORETICAL STUDIES

OVERVIEW	39
3. A STUDY OF ERROR-CORRECTING CODES, I by L. Calabi and L. K. Arquette	41

1. Introduction	41
2. Preliminaries	42
3. Mappings Associated with a Code	47
4. Irredundant and Precorrecting Codes	51
5. Correcting Codes	56
4. A STUDY OF ERROR-CORRECTING CODES, II: DECODABILITY PROPERTIES by L. K. Arquette and W. E. Hartnett	61
1. Introduction	61
2. Codes and Mappings	64
3. Correcting Codes	70
4. Decodable Codes	74
5. Prompt Codes	80
5. A STUDY OF ERROR-CORRECTING CODES, III: SYNCHRONIZABILITY AND COMMA-FREEDOM by L. Arquette, L. Calabi, and W. E. Hartnett	83
1. Introduction	83
2. Synchronizable Codes	84
3. Comma-Free Codes	89
4. Diagrams and Tables	91
6. A STUDY OF ERROR-CORRECTING CODES, IV: CODE PROPERTIES AND UNAMBIGUOUS SETS by L. Calabi and W. E. Hartnett	97
1. Introduction	97
2. Extension of Concepts	98
3. Scansions	100
4. Code-Related Properties	102
7. SOME GENERAL RESULTS OF ABSTRACT CODING THEORY WITH APPLICATIONS TO THE STUDY OF CODES FOR THE CORRECTION OF SYNCHRONIZATION ERRORS by L. Calabi and W. E. Hartnett	107

1. Introduction	107
2. Separation for a Binary Relation	109
3. Error-Correcting Capability	110
4. Error-Decoding Capability	111
5. Error-Limiting Capability	113
6. On the Levenshtein Distance	114
7. Error-Correcting for the Levenshtein Metric	118
8. A Sufficient Condition for Decodability	120

PART III / TESTS AND CONSTRUCTIONS

OVERVIEW	125
8. THE SARDINAS/PATTERSON AND LEVENSHTBEIN THEOREMS by J. A. Riley	129
1. Introduction	129
2. The Residual Quotient	130
3. Characterization of $\mathcal{R}_n(C, D)$	133
4. Unique Decipherability	135
5. A Finiteness Condition. Codes with Bounded Delay	137
6. Synchronizable Codes	140
7. Some Numerical Bounds	143
9. GENERALIZATION OF TESTS FOR CERTAIN PROPERTIES OF VARIABLE-LENGTH CODES by W. E. Hartnett	147
1. Introduction	147
2. Definitions and Examples	149
3. A Construction Involving Gauged Sets	155
4. Tests for Certain Properties of Codes	161
5. Application of the Tests to Example Codes	168
10. ON A FAMILY OF ERROR CORRECTING AND SYNCHRO- NIZABLE CODES by T. Hatcher	173
1. Introduction	173
2. Definitions	174

3. Code Properties	176
4. Properties of N -Sets	179
5. Examples	186
11. A FAMILY OF CODES FOR THE CORRECTION OF SUBSTITUTION AND SYNCHRONIZATION ERRORS by L. Calabi and W. E. Hartnett	193
1. Introduction	193
2. The Codes A_n^c	195
3. Some General Results	198
4. The Codes A_n^c have Properties (1) and (2)	202
EPILOGUE	205
SELECTED BIBLIOGRAPHY ON CODING THEORY (1957-1968) FROM PARKE MATHEMATICAL LABORATORIES	207
REFERENCES	211
INDEX OF AUTHORS	213
INDEX OF SUBJECTS	214

