## TABLE OF CONTENTS

Prefa	CE	iii
Intro	DUCTION	1
Снарт	TER 1. BASIC CONCEPTS AND EQUATIONS	4
1.1	Closed linear systems	4
1.2	Coupling channels and open systems	7
1.3	Representation of input-interior and input-output trans-	
	formations	21
1.4	Examples	<b>30</b>
Снарт	TER 2. RESOLUTION OF OPEN SYSTEMS	39
2.1	Combination of operator clusters	39
	Kymological chains (from the Greek 'κυμα')	<b>42</b>
	Reduction of the operator to triangular form and kymo-	
	logical resolution	49
2.4		54
	Generalisation of the concept of kymological resolution	<b>62</b>
	Normalisation of an open system with respect to an	
	arbitrary point	66
Снарт	TER 3. MODELS OF OPEN SYSTEMS	74
3.1	Diagonal of an open system	74
3.2	Equivalence of open systems	<b>79</b>
3.3	Synthesis of a stationary system from its transmission	
	operator	82
3.4	On a problem in the theory of spectral perturbation of	
	Hermitian operators. Ahiezer polynomials	96

## **Table of Contents**

3.5	Linearisation of the formula $E = \sqrt{(mc^2)^2 + (cp)^2}$ by means of the Čebyšev matrices. Attempt at a physical inter-	
	pretation	105
Снар	TER 4. ELECTRICAL NETWORKS	113
4.1	Multigraphs and electrical networks	113
4.2	The matrices $Z$ , $Y$ and $S$	118
4.3	The operator complex of a transmitting multipole	126
Снар	TER 5. Transformation of open systems	139
5.1	Classes of systems. Change of basis in the coupling	
	channel space	139
5.2	Transformations $L_0$ , $L_1$ and $L_2$	142
5.3	An electrical model of a two-pole system and network	
	synthesis of four-poles	152
Снарт	ter 6. Systems with an infinite number of degrees of	
	FREEDOM	164
6.1	Problem of reflection at end-section of a two-conductor	i
	line	164
6.2	Infinite discrete chains	167
6.3	Unbounded operator complexes	177
6.4	Continuous chains	186
Снарт	TER 7. WAVEGUIDES AND QUANTUM-MECHANICAL SCATTERING	
	THEORY	203
7.1	Preliminary remarks	203
7.2	Problem of reflection from non-uniformities in wave-	
	guides	208
7.3	Scattering of particles in a potential field	223
7.4	Compound nucleus in the scattering problem	230
Снарт	rer 8. Non-stationary motion in open systems	240
8.1	Equation of evolution of an open system	240
8.2	Resolution of open systems for non-steady motion	245
8.3	Some properties of evolutionary equations	255
BIBLI	OGRAPHY	269

	7		