

TABLE OF CONTENTS

I. INTRODUCTION	3
1. The stability problem	3
2. Historical comments	8
3. Other problems	10
4. Unstable and statistical behavior	14
5. Plan	18
II. STABILITY PROBLEM	21
1. A model problem in the complex	21
2. Normal forms for Hamiltonian and reversible systems	30
3. Invariant manifolds	38
4. Twist theorem	50
III. STATISTICAL BEHAVIOR	61
1. Bernoulli shift. Examples	61
2. Shift as a topological mapping	66
3. Shift as a subsystem	68
4. Alternate conditions for C^1 -mappings	76
5. The restricted three-body problem	83
6. Homoclinic points	99
IV. FINAL REMARKS	109
V. EXISTENCE PROOF IN THE PRESENCE OF SMALL DIVISORS	113
1. Reformulation of Theorem 2.9	113
2. Construction of the root of a function	120
3. Proof of Theorem 5.1	127
4. Generalities	138
A. Appendix to Chapter V	149
a) Rate of convergence for scheme of §2b)	149
b) The improved scheme by Hald	151

VI. PROOFS AND DETAILS FOR CHAPTER III	153
1. Outline	153
2. Behavior near infinity	154
3. Proof of Lemmas 1 and 2 of Chapter III	160
4. Proof of Lemma 3 of Chapter III	163
5. Proof of Lemma 4 of Chapter III	167
6. Proof of Lemma 5 of Chapter III	171
7. Proof of Theorem 3.7, concerning homoclinic points	181
8. Nonexistence of integrals	188
BOOKS AND SURVEY ARTICLES	191