

CONTENTS

	Page
Section One INTRODUCTION	1
1. Atoms, Electrons, and Electric Charges	2
2. Electric Circuits	10
3. Circuit Diagrams and Symbols	13
4. Safety Rules, Practices, and Devices	22
5. Occupations in Electricity and Electronics	36
Section Two ELECTRIC CIRCUITS AND DEVICES	48
6. Voltage, Current, and Power	48
7. Conductors and Insulators	54
8. Resistance and Resistors	59
9. Ohm's Law and Power Formulas	69
10. Series and Parallel Circuits	76
11. Measuring Electrical Quantities	85
12. Capacitance and Capacitors	99
13. Magnetism	111
14. Electromagnetism	119
15. Electromagnetic Induction and Inductance	127
Section Three ENERGY SOURCES	143
16. Chemical Cells and Batteries	143
17. Generators	153
18. Other Sources of Electric Energy	161
Section Four ELECTRONICS-THEORY AND DEVICES	170
19. Electron Tubes	170
20. Semiconductors and Diodes	177
21. Transistors	186
22. Other Solid-state Devices	196
23. Printed Circuits	206
Section Five ELECTRICAL WIRING-MATERIALS, TOOLS, AND PROCESSES	217
24. Project Planning and Construction	217
25. Wires and Cables	224
26. Wiring Tools and Devices	232
27. Soldering	248
28. Making a Sheet-metal Chassis	255
Section Six ELECTRICITY WORK	266
29. Lamps and Lighting	266
30. Producing Chemical Reactions	275
31. Home Electrical Systems	280
32. Electric Motors	293
33. Producing Heat	309
34. Refrigeration and Air Conditioning	312
35. The Automobile Electrical System	326
Section Seven COMMUNICATION AND INFORMATION SYSTEMS	338
36. Basic Concepts in Communication	338
37. Telegraph and Teletypewriter	343
38. The Telephone System	351

39. Audio Systems	356
40. Fundamentals of Radio	374
41. Fundamentals of Television	386
42. Telemetry	403
43. Computers and Data Processing	407
Section Eight ELECTRICITY AND INDUSTRY	419
44. The electric Power Industry	419
45. Research and Development in Electronics	429
46. Product Manufacturing	434
Section Nine TESTING AND TROUBLESHOOTING	439
47. Electronic Test Instruments	439
48. Troubleshooting and Repair	446
Section Ten SUGGESTED PROJECTS	452
Index	466