Contents

Preface vii

Film Resistors

133

Semiconductors and Integrated Circuits

Basic Course in Semiconductors and ICs 3	
Lesson 1: What electricity does 5 Lesson 2: How transistors work 11 Lesson 3: Building a circuit 16 Lesson 4: Building a system 20 Lesson 5: Understanding digital circuits 25 Lesson 6: Putting digital ICs to work 30 Lesson 7: Semiconductor types and uses 35 Lesson 8: Semiconductor properties 39 Lesson 9: Understanding diodes 43 Lesson 10: Manufacturing processes 48 Lesson 11: Understanding transistors 53 Lesson 12: Thyristors and optoelectronics 58 Lesson 13: Field-effect transistors 63 Lesson 14: Introduction to integrated circuits 68 Lesson 15: Understanding digital IC specs 74 Lesson 16: Digital IC types and families 78 Lesson 17: MOS ICs: construction, operation and applications Lesson 18: Linear ICs 90	83
Semiconductor Yields and Life Cycles 95	
Ion Implantation 99	
Hybrid ICs 101	
Operational Amplifiers 105	
A/D and D/A Converters 109	
SCRs, Triacs and Other Thyristors 115	
Diodes and Rectifiers 121 Passive Components	
Resistors 127	

Capacitors 137

Film Capacitors 143

Incandescent Lamps 147

Plastic Potentiometers 151

Electro-mechanical Components

Printed Circuit Edge Connectors 157

Circular Connectors 161

Crimp Terminals

Printed Circuit Boards 73

Wire and Cable 79

General Purpose Relays 185

Reed Relays 193

Reed Relays Checklist 197

Solenoids 199

System Enclosures 203

Optoelectronics

LEDs (Light-Emitting Diodes) 207

Light-Emitting Diode Readouts 2

Photocells 215

Materials for Electronics

Thermoplastics 221

Instruments

DC Power Supplies 227

Panel Meters 231

Meter Relays 235

Index 237

About the Editor 241