

ANNUAL INDEX OF ARTICLES—1963

The annual index of ELECTRONIC INDUSTRIES has been arranged by subjects for easy reference to related topics. The first figure indicates the month in which the article appeared; the second indicates the page number.

BOOKS

Aerospace Facts and Figures	2-80
Anatomy of Automation	Amber & Amber 1-70
A Primer of ALGOL 60 Programming	E. W. Kijikstra 1-74
Digital Processes for Sampled Data Systems	Alfred J. Monroe 2-80
Electric Circuit Analogies for Elastic Structures	Richard H. MacNeal 2-80
Introduction to Automatic Control Systems	Robert N. Clark 2-80
Introduction to Electronic Data Processing Equipment	Robert V. Oakford 1-70
Introduction to Electronics	Walter H. Evans 1-70
Servicing Transistorized Two-Way Radio	Patrick M. Craney 2-80

CIRCUITS

A Logical Approach to Logic Circuits	James J. Klimkowski 5-110
A Look at Coded Disks and Encoders	C. Farrell Winder 6-F2
Antennas Have Built-in Circuits	John R. Copeland & William J. Robertson 5-115
A Simple Electronic Analog Multiplier	Frederick F. Slack 3-219
A Simple Vacuum Tube Mini-Ohmmeter	Dr. Siegfried S. Meyers 5-126
A Tester for Wiring Shorts	Willis E. Dobbins 4-216
A Transistor Amplifier with AGC	Edgar C. Smith 1-200
Automatic Frequency Selected Circuitry	Charles E. Brady & Burton Leary 2-114
A Variable Frequency Multivibrator	Eugene H. Ogle 2-101
Ceramics: A New Dimension in Circuitry	Donald G. Sturges 6-G15
Characteristics of Unipolar Field-Effect Transistors	Arthur D. Evans 3-99
Choosing a Voltage Reference	John M. Fluke & Robert W. Hammond 8-129
Circuit Realizability Criteria	John W. Lapatra 4-104
Constructing Broadband R-F Switches	W. Bruce Warren, Jr. 2-97
Control System Compensation	J. S. Jackson 11-188
Data Processing System Advances	Dr. Robert R. Johnson 6-K3
Designer's Guide to: Lamps, Indicator Lights, Illuminated Switches	Louis S. Gomolak 1-141
Designing Active Tuned Filters	Herbert D. DePew 7-158
Designing Adaptive Digital Networks	G. S. Glinski 2-104
Designing Wide Pulse-Width Modulators	Sanford Jacobson 3-109
Designing with . . . Optoelectronic Components	Richard K. McDonald 5-102
Encapsulating to Military Specifications	Frederick L. Koved 7-92
Function Generation with Active Nonlinear Elements	Nick D. Diamantides 4-102
Improving the Accuracy of R-F Voltage Measurements	Raymond E. Lafferty 7-87
Integrated Circuit Design Techniques	John R. Hulme 4-112
Mathematical Models for Engineers	Dr. Raymond S. Berkowitz 9-39
Microelectronics: In Search of the Ideal Circuit	Robert C. Sprague 6-B10
New Flip-Flop Design Improves Efficiency	Paul L. Conant, Sr. 3-107
New Standards for Rotary Switches	Irving Carol 6-F8
On the Properties of Negative Immittance	Dr. Keats A. Pullen, Jr. 9-87
Operational Systems . . . A Current Computer Trend	Robert E. Clement 6-K7

Photoconductor Devices in Control Circuits	Dr. Frank E. Jaumot, Jr. & Roger W. Beck 6-D10
Progress in Telemetering and Pulsing Devices	George Merker & John J. Piret 6-F14
Reducing Ripple In Regulated Supplies	V. R. Cunningham 12-63
Resistors for Precise Temperature Measurement	George P. McKnight 7-97
Selecting an AC Power Source	O. G. Leichter 8-192
Smoothing-Predicting Sampled Data	David B. Borkum 9-81
Synthesis of an Active Chebyshev Filter	Walter Morton 3-112
Testing Without Direct Electrical Connections	David M. Goodman 6-E6
Test Set Detects All Dialing Troubles	Fred Lee 5-202
The Future of Integrated Circuits	Dr. Daniel E. Noble 6-C2
The Future of Semiconductor Devices	Dr. A. M. Glover 6-C6
The Node Method of Circuit Analysis	Robert L. Gottier 3-102
Thermistors for Temperature Stabilization of Transistor Circuits	Michael L. Chater 4-109
The Status of Microelectronics	E. Q. Carr 6-C18
Transistor AC Regulator for X-ray Tube Current	Dr. Abraham Taylor & Keith H. Sueker 5-121

CIRCUIT WISE

A Simple Hi-F _i Output Circuit	7-96
Diode "And" Gate	7-86
DTL Power Converter	5-120
High Voltage Recycling	11-104
Improved Neon Trigger Circuit	5-109
Indicator	1-113
Monostable Multivibrator	2-109
Pulse Emitter Follower	4-101
Transistor "And" Circuits	9-88

SYSTEMS

A Communications System for "Apollo"	Don R. Holcomb 10-108
A Digital Wire Guidance System	M. F. Borkowski, et al 9-169
A New Digital Telemetering System	H. H. Georgens & L. I. Duthie 1-123
Antennas Have Built-In Circuits	John R. Copeland & William J. Robertson 5-115
Automatic Frequency Selected Circuitry	Charles E. Brady & Burton Leary 2-114
Automatic Tracking Antenna Systems	Laverne E. Williams 10-92
High-Speed Digital Communication Networks	Carl Hammer 1-96
Progress in Telemetering and Pulsing Devices	George Merker & John J. Piret 6-F14
Project Apollo's Command and Control	Dr. Walter B. La Berge 7-58
Reliability Trends in Space Electronics	Dr. Donald B. Duncan 6-I-3
Test Set Detects All Dialing Troubles	Fred Lee 5-202
Time Decoding for Satellite Tracking Systems	Alan Demmerle, et al 10-182
Self-Verification-Needs and Methods	J. Cohen, et al 2-92
Simple, Economical Laser Demodulation	H. G. McGlees & G. W. Saeger 5-107

COMPONENTS—CHASSIS ELEMENTS

A Look at Modern Diplexers	Thomas J. Vaughan 4-94
A Speedy Method of Computing Dielectric Properties	Peter H. Gum & B. Alva Schoomer, Jr. 9-90
A Survey of High Power Microwave Filters	V. G. Price & W. A. Edson 11-106

ANNUAL INDEX (Continued)

Connectors—and Terminations Smedley B. Ruth	4-57
For X-Y Plotting Saturable Reactor Sweep Supply	
Malvin L. Shar	1-111
Function Generation with Active Nonlinear Elements Nick D. Diamantides	4-102
How To Specify Magnetostrictive Filters C. W. Carruthers	12-57
Heat-Shrinkable Polymers Reduce Insulation Problems Duane D. Rodger	6-66
Improvements Increase Ceramic Capacitor Reliability Larry Nordquist	9-76
Introduction To the Synchro Transolver A. E. Hayes	12-69
New Standards for Rotary Switches Irving Carol	6-F8
Photoconductor Devices in Control Circuits Dr. Frank E. Jaumot, Jr. & Roger W. Beck	6-D10
Plastic Dielectrics in Capacitors Troy L. Pestel	6-D21
Progress in the Relay Field Charles F. Cameron	6-F25
Refractory Metals in Electronic Components Ralph F. Hoeckelman	6-G2
Resistors for Precise Temperature Measurement George P. McKnight	7-97
Resistors: Then and Now Lyman S. King	6-D3
Silicone Dielectrics Improve Connectors Roland Lawrence	4-99
Synthesis of an Active Chebyshev Filter Walter Morton	3-112
The Outlook for Adhesives in Electronics Eugene F. Hess	6-G10
Transient Response of Ceramic Filters Franz L. Sauerland	1-106

COMPUTERS

A Logical Approach to Logic Circuits James J. Klinkowski	5-110
All Magnetic Content Addressed Memory Robert R. Lussier & Robert P. Schneider	3-92
A Look at Coded Disks and Encoders C. Farrell Winder	6-F2
A Simple Electronic Analog Multiplier Frederick E. Slack	3-219
A Speedy Method of Computing Dielectric Properties Peter H. Gum & B. Alva Schoomer, Jr.	9-90
Automatic Frequency Selected Circuitry Charles E. Brady & Burton Leary	2-114
Data Processing System Advances Dr. Robert R. Johnson	6-K3
Deciding About Programmed Instruction James L. Becker	9-179
Designing Alternative Digital Networks G. S. Glinkski	2-104
High-Reliability Computers Using Duplex Redundancy R. W. Lowrie	8-116
High-Speed Digital Communication Networks Carl Hammer	1-96
Operational Systems A Current Computer Trend	
Robert E. Clement	6-K7
Smoothing-Predicting Sampled Data David B. Borkum	9-81
Time Will Sell Marketing Industrial Control	
Computers S. Feldman	12-32
The Hybrid Computer End of An Argument S. Ruth	12-38
The Artificial Neurons—For Machines That Learn Howard Moraff	12-52
For Computers & Automation Sensing & Control	
of Tape Slack Level B. D. Jimersen	12-65
Technical Translations By Computer Staff	12-76
Trends in Process Control Computers D. L. Stevens	6-K10

CONVENTIONS

Expect Record Attendance at First I.E.E.E. Convention	3-57
1963 International Solid State Circuits Conference	2-198
Technical Sessions to Highlight NEREM '63	10-68
National Electronic Conference	10-66
WESCON Exhibitors & Visiting Companies	8-45
WESCON Features Heavy Technical Program	8-34
WESCON: The Outlook for 1963	8-22

EDITORIALS

American Industries are Our Challenge	10-1
---	------

Can We Solve Our Manpower Problem?	1-1
Looking Ahead!	3-1
Our 'New Look' Continues	8-1
Over-Regulation: A Genuine Problem	
Emmet G. Cameron	8-19
Recruiters Tell Your Future	11-1
Research with Purpose!	7-1
The Engineer is in Business, Too!	9-1
Time for Evaluation?	2-1
Unionism or Professionalism?	4-1
What About "Obsolete" Engineers?	5-1
Your 1963 State of the Art Reference Issue	6-2

ENGINEER'S NOTEBOOK

#65 Inductive and Capacitive Reactance David P. Cost	1-131
#66 Parallel-Resistance Nomograph Louis J. Streidnie	3-105
#67 Decibel Nomograph Harold Y. Wong	4-116
#68 Useful Mathematical Approximations Arthur L. Plevy	9-89
#69 Antenna Effectiveness B. R. Hatcher	10-87

GENERAL

Alphabetical Listing of Manufacturers	6-13
Industrial Electron Tubes	6-12
Look Before You Leap—With R&D By-Products	5-70
Mathematical Models for Engineers	
Dr. Raymond S. Berkowitz	9-39
National Security and its Technological Requirements Gen. Bernard F. Schriever	6-86
New Developments in Laser Weapons J. DeMent	11-78
Oceanography & Anti-Submarine Warfare	3-38
Predictions for the Future of the Electronic Industry Adm. Charles F. Horne	6-132
Product Finding Index	6-142
Storage to Picoseconds—A Survey of the Art C. N. Winningstad	8-122
The Outlook for Thermoelectric Devices Robert L. Brickley	6-186

INSTRUMENTS, MEASUREMENTS, TEST METHODS

An Evaluation of Environmental Testing John D. Losse	7-70
A Simple Vacuum Tube Mini Ohmmeter	
Dr. Siegfried S. Meyers	5-176
A Tester for Wiring Shorts Willis E. Dobbins	4-216
Calibration Laboratory On Wheels Robert Saul	2-184
Choosing a Voltage Reference John M. Fluke & Robert W. Hammond	8-129
Electronic Measurement Standards Ivan G. Easton	6-F11
For X-Y Plotting Saturable Reactor Sweep Supply	
Malvin L. Shar	1-111
How to . . . Calculate Hard Tube Modulator Fall Time G. E. Tallmadge	11-111
Improved Checkout for IR Detectors Paul R. Bradshaw	10-82
Improving Rate Tables for Gyro Testing A. Scott Hamilton	9-73
Improving the Accuracy of R-F Voltage Measurements Raymond E. Lafferty	7-87
New Techniques in R-F Room Construction E. A. Lindgren	12-152
Obtaining High and Ultrahigh Vacuum Dr. Lewis D. Hall	10-102
Random-Motion Testing of Electronic Components Roland I. Ostrander & Richard H. Tuft	7-83
Resistors for Precise Temperature Measurement George P. McKnight	7-97
Storage to Picoseconds—A Survey of the Art C. N. Winningstad	8-122
Survey of Vacuum Technology Wilfrid G. Matheson	10-44
Test Set Detects All Dialing Troubles Fred Lee	5-202
Well Regulated Battery-Solar Cell Charging Irwin Stein, et al	10-88

MATERIALS

An Improved Insulation for Space Use Dr. Vincent L. Lanza & Dr. E. C. Stivers	7-100
Encapsulating to Military Specifications Frederick L. Koved	7-92
Chemicals in the Electronic Industry James W. Swaine	6-G33
Heat-Shrinkable Polymers Reduce Insulation Problems Duane D. Rodger	6-66
Silicone Dielectrics Improve Connectors Roland Lawrence	4-99

The Outlook for Adhesives in Electronics..... Eugene F. Hess 6-G10

MARKETS

Connectors—and Terminations Smedley B. Ruth 4-57
 Disarmament: What Would It Mean to the Electronic Industry? Sidney Feldman 4-42
 1962 Electronic Industry Statistics 1-101
 Electronics Growth Brings Trouble for Labor Sidney Feldman 10-57
 Government Contract Awards 6-H8
 Industry Opens up New Areas of U.S. Sidney Feldman 7-47
 Look Before You Leap—with R&D By-Products Joseph K. Slapp 5-70
 Low Volume Manufacturing in Underdeveloped Countries Gerald D. Jones 4-232
 Making Use of Sales Engineers L. J. Chamberlain 11-49
 Management Overhaul Key to Ampex Recovery Philip Geddes 4-86
 Microwaves—A Market in Transition S. Feldman 11-58
 1963 Military Electronic Procurement Directory 6-H2
 National Security and its Technological Requirements Gen. Bernard F. Schriever 6-B6
 New Shift in Purchasing to Affect Industry C. W. Irven 11-69
 Now That the Wall Street Waltz is Over—What? Sidney Feldman 5-58
 Over-Regulation: A Genuine Problem Emmet G. Cameron 8-19
 Predictions for the Future of the Electronic Industry Adm. Charles F. Horne 6-B2
 The Future of Integrated Circuits Dr. Daniel E. Noble 6-C2
 The Future of Semiconductor Devices Dr. A. M. Glover 6-C6
 The Outlook for Adhesives in Electronics Eugene F. Hess 6-G10
 The Outlook for Thermoelectric Devices Robert I. Brickley 6-D6
 The Role of R&D in Future Profits Patrick E. Haggerty 1-227
 Time Will Sell ... Marketing Industrial Control Computers S. Feldman 12-32
 Trends in Semiconductor Research Dr. John Bardeen 6-C12
 U.S. Needs Electronic Capability for Space Elmer T. Ebersol 9-28

MICROWAVE

A Look at Modern Diplexers Thomas J. Vaughan 4-94
 A Speedy Method of Computing Dielectric Properties Peter H. Gum & B. Alva Schooner, Jr. 9-90
 A Survey of High Power Microwave Filters V. G. Price & W. A. Edson 11-106
 Automatic Tracking Antenna Systems Lavergne E. Williams 10-92
 Calibration Laboratory ... On Wheels Robert Saul 2-184
 Coaxial Magnetrons a New Class of Tubes Roger LaPlante 1-90
 Designing Wide Pulse-Width Modulators Sanford Jacobson 3-109
 Generating Ultrasonics at Microwave Frequencies W. Brouillette & S. Wanuga 11-93
 Microwave Diodes—A Progress Report L. Riehman 11-86
 Microwave Tubes: After Three Decades Dr. Dean A. Watkins 6-12
 Microwaves—A Market in Transition S. Feldman 11-58
 New Developments in Antennas Dr. L. Peters, Jr., et al 6-18
 New Developments in Laser Weapons J. De Ment 11-78
 New Developments in Luneberg Lens Antennas R. L. Horst 11-100
 New Technics In R-F Room Construction E. A. Lindgren 12-152
 Progress in Telemetry and Pulsing Devices George Merker & John J. Piret 6-F14
 Simple, Economical Laser Demodulation H. G. McGlees & G. W. Saeger 5-107
 Time Decoding for Satellite Tracking Systems Alan Demmerle, et al 10-182

PRODUCTION METHOD

Building Reliability Into Space Instruments Stuart C. Baker 10-98
 Connectors—and Terminations Smedley B. Ruth 4-57
 Improving Semiconductor Reliability Hauw T. Go 2-110

Integrated Circuit Design Techniques John R. Hulme 4-112
 Low Volume Manufacturing in Underdeveloped Countries Gerald D. Jones 4-232

PROFESSIONAL OPPORTUNITIES

An Engineer's Guide to Job Hunting John J. Traynor, Jr. 3-233
 Becoming A Professional Engineer R. G. Straux 12-159
 Helping Employees Pays Off Dr. Mario F. Contorti 8-207
 How Do Engineers Keep Up-to-Date? 5-79
 Job Seekers' Motivations: Recognition, Challenge, etc. Eugene Raudsepp 7-166
 Technical Writing: Superstition and Fact Roger M. D'Aprix 10-194
 The Other Side of the Engineer Shortage! W. A. Douglas 11-196
 What the Engineer Should Know About Pert Harry G. Benis 5-217
 Who is the 'Unemployable' Engineer 11-200

RELIABILITY

An Evaluation of Environmental Testing John D. Losse 7-70
 Controlling Stress Increases Reliability Robert E. Hovda & Dr. William J. West 6-1-5
 Control System Compensation J. S. Jackson 11-188
 Encapsulating to Military Specifications Frederick L. Kovel 7-92
 High Reliability Computers Using Duplex Redundancy R. W. Lowrie 8-116
 Improvements Increase Ceramic Capacitors Reliability Larry Nordquist 9-76
 New Flip-Flop Design Improves Efficiency Paul L. Couant, Sr. 3-107
 Plastic Dielectrics in Capacitors Troy L. Pestel 6-121
 Random Motion Testing of Electronic Components Roland J. Ostrander & Richard H. Tuft 7-83
 Reliability Trends in Space Electronics Dr. Donal B. Duncan 6-1-3
 Thermistors for Temperature Stabilization of Transistor Circuits Michael L. Chater 4-109

SEMICONDUCTORS

All-Magnetic Content Addressed Memory Robert R. Lussier & Robert P. Schneider 3-92
 Antennas Have Built-in Circuits John R. Copeland & William J. Robertson 5-115
 A Simple Electronic Analog Multiplier Frederick E. Slack 3-219
 A Transistor Amplifier with AGC Edgar C. Smith 1-200
 A Variable Frequency Multivibrator Eugene H. Ogle 2-101
 Ceramics: A New Dimension in Circuitry Donald G. Sturges 6-G15
 Characteristics of Unipolar Field-Effect Transistors Arthur D. Evans 3-99
 Designing with ... Optoelectronic Components Richard K. McDonald 5-102
 Diode Resistance to Nuclear Radiation Alvin B. Kaufman & Richard C. Eckerman 8-134
 Gallium Arsenide: What is its Status? John E. Hickey, Jr. 2-47
 Improving Semiconductor Reliability Hauw T. Go 2-110
 Integrated Circuit Design Techniques John R. Hulme 4-112
 Microelectronics: In Search of the Ideal Circuit Robert C. Sprague 6-B10
 Microwave Diodes—A Progress Report L. Riehman 11-86
 On the Properties of Negative Immittance Dr. Keats A. Pullen, Jr. 9-87
 Photoconductor Devices in Control Circuits Dr. Frank E. Jaunot, Jr. & Roger W. Beck 6-D10
 Simple, Economical Laser Demodulation H. G. McGlees & G. W. Saeger 5-107
 The Future of Integrated Circuits Dr. Daniel E. Noble 6-C2
 The Status of Microelectronics E. Q. Carr 6-C18
 The Future of Semiconductor Devices Dr. A. M. Glover 6-C6

(Continued on page 168)

ANNUAL INDEX (Concluded)

The Search for New Semiconductor Materials	
Dr. W. R. Runyan	6-G17
Transistor AC Regulator for X-ray Tube Current	
Dr. Abraham Taylor & Keith H. Sueker	5-121
Trends in Semiconductor Research	6-C12
Dr. John Bardeen	
Where Ultrasonic Transducers Are Today	
Dr. Erhard Sittig	6-E2

SPACE

A Communications System for "Apollo"	
Don R. Holcomb	10-108
A New Digital Telemetering System	
H. H. Georgens & L. I. Duthie	1-123
An Improved Insulation For Space Use	
Dr. Vincent L. Lanza & Dr. F. C. Stivers	7-100
Building Reliability Into Space Instruments	
Stuart C. Baker	10-98
Controlling Stress Increases Reliability	
Robert E. Hoyda & Dr. William J. West	6-1-5
Improved Checkout for IR Detectors	
Paul R. Bradshaw	10-82
Improving Rate Tables for Gyro Testing	
A. Scott Hamilton	9-73
Obtaining High and Ultrahigh Vacuum	
Dr. Lewis D. Hall	10-102
Project Apollo's Command and Control	
Dr. Walter B. La Berge	7-58
Reliability Trends in Space Electronics	
Dr. Donal B. Duncan	6-1-3
Self-Verification-Needs and Methods	2-92
J. Cohen, et al	
Survey of Vacuum Technology	10-44
Wilfrid G. Matheson	
Time Decoding for Satellite Tracking Systems	
Alan Demmerle	10-182
U.S. Needs Electronic Capability for Space	
Elmer T. Ebersol	9-28
Well Regulated Battery-Solar Cell Charging	
Irvin Stein, et al	10-88

TUBES

Coaxial Magnetrons A New Class of Tubes	
Roger LaPlante	1-90
Designing With Pulse-Width Modulators	
Sanford Jacobson	3-109
Designing Active Tuned Filters	7-158
Herbert D. Depew	
How to.....Calculate Hard Tube Modulator Fall Time	
G. E. Tallmadge	11-111
Industrial Tubes Today	6-C44
D. Marshall & James B. Hall	
Microwave Tubes: After Three Decades	
Dr. Dean A. Watkins	6-J2
Tubes—Today and Tomorrow	6-C38
Robert E. Moe	

WHAT'S NEW

Communications & Antennas

Anywhere TV System	4-201
New Space Systems Center Features Earth-Orbit	
Simulators	7-40
Spiral Antennas	11-199

Computers

Automatic Lift Saves Computer Drum Surface	2-106
Automatic Typesetting Computer	12-46
Computer Speeds Wiring	3-85
Count Modules Readout & Print	8-142
Made—For Ultra-High Speed Low Level Logic Circuits	3-85
Multi-Character Display Tube	8-140
Multi-Function Logic Element	
New Programming Concept	4-76
Servo Amplifier	5-92
Transistor "And" Circuits	9-88

Components

Circuit Testing Connectors	4-80
----------------------------------	------

DC-to-Square Wave Converter	3-108
"Foolproof" Connector	10-79
Heat Shrinkable Tubing by Irradiation	2-162
Light Dependent Resistor	5-95
Magnetic Bearing	4-80
Metal-Film Trimming Pot	5-207
Metal Glaze Resistors	8-198
New Cup-Core Inductor Design	12-51
New Trend in Variable Transformers	3-170
Pot Has Low Backlash	8-145
Powder Metal Cathodes	10-97
Reliability Increased by R-F Detection	3-81
Small Film Capacitors	11-38
Solderless Wiring Technique	8-144
Solid State Bulk Tantalum Capacitor	4-226
Teflon Extrusions	10-74
Ultra-Stable Reference Elements	2-84

General

Cam Generating System	7-40
Emergency Name Plates	3-104
High Frequency Lighting System	11-43
Hot Spot Cooler	12-133
No Heat Damage	7-38
Protecting Fragile Tubes	11-43
Stain Free Drying	1-132
Welding with Water	2-84

Microwave

Advanced Radar Technique	11-192
Giant Pulse Lasers	3-162
Ku Magnetrons	11-38
New Laser "Dwarfs" Moon Model	3-81
New Type TWT Focusing	7-42
Plastic Laser	4-77
Pocket-Size Laser	9-85
Laser System	10-77

Research & Test Equipment

Automatic Relay Test Set	9-102
Electron Mirror Microscope	4-223
Fault Detector	12-46
Integrated Circuit Tester	8-198
Largest Electron Accelerator	7-99
Low Cost Meter Relay	12-49
Magnetic Field Rotates Ultrasonic Waves—New	
Devices Possible?	3-80
Microbalance Measures Ultra-thin Films	10-106
Microwave Moisture Meter	11-41
Minuteman Program Devices Checked	7-42
NASA Facility Gets Huge Space Chambers	7-38
New Chambers to Assist Manufacturers in Space Work	7-39
New Tricks with Strobes	9-100
Nuclear Particle Detector	8-140
Operational Amplifiers	5-95
Resistance Measurement System	5-98
Test Chamber Features Both Cold Wall and Solar	
Simulation	7-39
Vibrationless Piston Pump	10-74

Semiconductor & Thin Film

Building-Block Elements	5-94
Continuous Thin Film System	1-133
Digital Microcircuit	5-94
Four Input DCTL NOR Gate	5-96
GaAs As an Infrared Source	1-132
High Fan Out Gate	5-93
Integrated One-Shot	5-94
"Maskless" Thin Film Production	2-164
New Transistor Manufacturing Process	8-143
Optical Transistor	4-76
Planar Epitaxial NPN	11-41
Single Chip, R-F Amplifier	5-93
Single Molecular Layer Metal to Thermoplastic	4-221
40-mm Single Silicon Crystals	3-84
Thin Films & Discrete Components	7-40

