# **Annual Index** IEEE spectrum

# Volume 7, 1970

This section contains complete multientry indexes covering the contents of IEEE Spectrum for the calendar year 1970. The Author Index includes authors of feature articles and book reviewers. The Subject Index includes feature articles and book reviews (listed alphabetically by subject under the category "Book Reviews"). The News Index includes items from the Focal Points and News of the IEEE sections, except for People and Obituary items, which are listed separately.

In the Subject Index, there are several entries for each published item, under descriptive subject headings that establish a context. The item is referenced only in abbreviated form in the Subject Index. Always refer to the Author Index for full details.

Microfiche frame information is given by a four-character code in parentheses following the inclusive page numbers; the first character of this code indicates microfiche number within the set that contains the issue, the second character identifies the row of the microfiche in which the first frame of the item appears, and the last two characters designate the position of that frame within the row. For further information about IEEE microfiche, write to the address given in the box below.

Author Index	
Subject Index	99
Book Reviews	99
News Index	104
People	107
Obituaries	

### **AUTHOR INDEX**

Abdel-Iatif, M., and M. J. O. Strutt; SPEC 70 Nov 11 (1C02)

Comments, and author's reply, on DeFalco, John A.; Reflection and crosstalk in logic circuit interconnections; SPEC 70 Jul 44-40

Affel, Herman A., Jr.; SPEC 70 Jun 105 (3B03). Review of Flores, Ivan; Computer Organization.

Anderson, Victor C.; Acoustic communication is better than none; SPEC 70 Oct 63-68 (2C06)

Asmussen, Jes; SPEC 70 Apr 102, 104 (2E12). Review of Durney, Carl H., and Curtis C. Johnson; Introduction to Modern Electromagnetics.

Austin, Arthur L., and John W. Brewer; World population growth and related technical problems; SPEC 70 Dec 43-54 (1E10)

Avila, Charles F., and Andrew F. Corry; Underground transmission in the United States; SPEC 70 Mar 42-48 (1E10)

- Bachynski, Morrel P.; SPEC 70 May 100 (2F03). Review of Simon, Albert, and William B. Thompson (Eds.); Advances in Plasma Physics, Vol. 2.
  Barnes, Frank S.; Spectral lines: The electrical engineer and public policy; SPEC 70 May 21 (1D01)
  Barrow, Bruce B.; Spectral lines: Standards are important; SPEC 70 Dec 24 (1D03)

- Dec 24 (1D03)
  Barrow, Bruce B., SPEC 70 Oct 104-105 (3B07). Review of Martin, James; Telecommunications and the Computer.
  Beam, Walter R.; SPEC 70 May 98 (2F01). Review of Stimler, Saul; Real-Time Data-Processing Systems: A Methodology for Design and Cost/Performance Analysis.
  Beiler, Adam Clarke; SPEC 70 Jun 109 (3B07). Review of Erber, T., and C. M. Fowler (Eds.); Francis Bitter—Selected Papers and Commentaries
- mentaries.
- Bekey, George A.; SPEC 70 Oct 102 (3B05). Review of Pun, Lucas; Introduction to Optimization Practice.
  Bélanger, R. P.; SPEC 70 Nov 91 (2E05). Review of Ortusi, J.; Mathematiques Appliques a L'Electronique—Tome 1: Mathematiques Generales, Tome 2: Transformations Temps-Frequence.

- Bello, Phillip A.; SPEC 70 May 99 (2F02). Review of Kennedy, R. S.;

- Bello, Phillip A.; SPEC 70 May 99 (2F02). Review of Kennedy, R. S.; Fading Dispersive Communication Channels.
  Benedict, Manson; Electric generating prospects for nuclear power; SPEC 70 Jul 24-30 (1D03)
  Bennett, Lawrence H.; SPEC 70 Sep 96 (2F02). Review of Tebble, R. S., and D. J. Craik; Magnetic Materials.
  Bianculli, Anthony J.; Stepper motors—application and selection; SPEC 70 Dec 25-29 (1D04)
  Birdsall, Charles K.; SPEC 70 Jun 106 (3B04). Review of Simon, Albert, and William B. Thompson (Eds.); Advances in Plasma Physics, Vol. 3
- Brandt, Franklin R.; SPEC 70 May 98 (2F01). Review of Holland, Richard, and Errol P. EerNisse; Design of Resonant Piezoelectric
- Brewer, John W., see Austin, Arthur L., SPEC 70 Dec 43-54
  Bridgewater, Albert W.; SPEC 70 Jun 105-106 (3B03). Review of Rosenfeld, Azriel; Picture Processing by Computer.
  Bristol, Edgar H.; SPEC 70 Jul 101 (2F03). Review of Yakowitz, Sidney J.;
  Mathematics of Adapting Control Processing
- Mathematics of Adaptive Control Processes.

  Brown, Ross E.; SPEC 70 May 102 (2F04). Review of Wells, Peter N. T.;
  Physical Principles of Ultrasonic Diagnosis.

A combined index to 1970 IEEE periodicals and conference papers will be published in 1971, and will also be available in computer-readable magnetic tape form. IEEE REFLECS tapes, containing indexing and abstracts of the entire world literature in electrical and electronics engineering, applied physics, and computer and control science, are also available for computer processing. Please address inquiries to IEEE Information Services Department, 345 East 47 Street, New York, N.Y. 10017

Computer Sciences "Man of the Year" Award, and the Connelly Memorial Award.

# Henry Kalmus given civilian service award

Henry P. Kalmus (F), chief scientist at the Army Materiel Command's Harry Diamond Laboratories, Washington, D.C., recently was presented the Department of Defense Award for Distinguished Civilian Service, the highest award that can be made to a civilian employee. At a ceremony held at the Pentagon, Secretary of Defense Melvin R. Laird presented Dr. Kalmus with the award "in recognition for and of his numerous contributions to military electronics, which has strengthened the defense postures of the United States."

Dr. Kalmus was born in Vienna, Austria, in 1906. He received the Dipl.Eng. degree from the Technical University of Vienna in 1930. Prior to coming to the United States in 1938, Dr. Kalmus spent eight years with the Orion Radio Corporation in Budapest, Hungary.

He was employed at the Emerson Radio Corporation, New York, N.Y., and Zenith Radio Corporation, Chicago, III., before joining the National Bureau of Standards and subsequently the Harry Diamond Laboratories.

Holder of over 40 patents, Dr. Kalmus received the Department of Commerce Gold Medal for Exceptional Service in 1954 and the Army's Gold Medal Award for Exceptional Service in 1961.

# Obituaries William R. Clark, former IEEE Treasurer



William Russell Clark (M '37, SM '44, F '61), former Treasurer and Director of IEEE (1963–1964), died October 16. He was chairman of the board and president of Eddystone Ma-

chinery Company of Chester, Pa.

Dr. Clark received the B.S. degree in 1929, the M.S. degree in 1932, and the Sc.D. degree in 1938, all from the University of Pennsylvania. In 1929 he joined the Leeds and Northrup Company as a research assistant. After a brief association with the Franklin Institute Museum, Dr. Clark returned to Leeds and Northrup Company for more than 25 years of service. He became supervisory research technologist of the electrical division of their Research Department in 1945, and in 1952 was appointed chief of the same division.

In 1955 he was appointed chief of the electromechanical division of the Research and Development Department, and in 1956 became assistant chief engineer. Dr. Clark was made manager of the Product Engineering Division later in 1956, and in 1962 staff assistant to the vice president of technical affairs.

Dr. Clark did pioneer work on electronic recorders of various types and has numerous patents in the fields of instrumentation, electronics, recorders, and controllers.

A member of both the AIEE and IRE since 1937, Dr. Clark had been chairman of the Philadelphia Section of AIEE in 1947–1948. He was a member of the AIEE Board of Directors in 1956–1962, having served as AIEE Treasurer from 1960 to 1962. He also served on the AIEE–IRE merger committee.

# Edward C. Day, dedicated IEEE employee



Edward C. Day (M '34, SM '55), Manager of Production for the IEEE Dictionary, passed away on October 2 at the age of 58 after a brief illness.

Born in Jersey City, N.J., in 1912,

Mr. Day received the B.S. degree in electrical engineering from New York University in 1933. Following his graduation, he was on the electric equipment staff, Testing Department, of Consolidated Edison Company in New York. From 1937 to 1938, Mr. Day was a junior engineer with the Western Electric Company of Kearny, N.J., and then spent two years as watt-hour meter inspector with Ivan T. Johnson Company of New York.

He returned to Western Electric for a year and then went on to join Camp Evans Signal Laboratory, Belmar, N.J., as associate radio engineer, with responsibility for the procurement and inspection of Signal Corps radio equipment. After four years and two more positions, Mr. Day joined the AIEE Headquarters staff in New York.

He began his service to AIEE as secretary of the Technical Program Committee of the Institute, in charge of all correspondence between authors and technical committees concerning the review of papers for presentation and publication. From 1949 until 1963, Mr. Day also was secretary of the AIEE Committee on the Award of Institute Prizes, responsible for preparation of award certificates and prizes, as well as for the review of papers eligible for AIEE prizes.

Following the formation of IEEE in 1963, Mr. Day continued in his func-

tions as secretary of the Technical Program Committee for the Winter and Summer Power Meetings, until his appointment in 1967 as Manager of Production for the forthcoming IEEE Dictionary.

The Institute's loss is best expressed by the following resolution passed by the IEEE Executive Committee, dated October 13, 1970:

For 22 years, Edward C. Day served the Institute of Electrical and Electronics Engineers and its predecessor society, the American Institute of Electrical Engineers, with outstanding devotion and dedication. As Secretary of the Technical Program Committee of the Institute for many years, and more recently as Manager of Production for the forthcoming IEEE Dictionary, he played an instrumental role in the process by which the Institute dissemivital technical information throughout the profession. He will long be remembered by the countless authors, committee members, and colleagues who had the privilege of working with him. On their behalf, the Executive Committee of the IEEE extends sincere sympathy to his family on the occasion of his sudden and untimely death.

John V. N. Granger President, IEEE

# M. M. Bridgwater, retired Arizona engineer



Malcolm M.
Bridgwater (M '41,
SM '48, F '60), a
retired executive of
Arizona Public Service Company, died
September 30. Mr.
Bridgwater was vice
president and manager of contracts

and scheduling at APS, where he had been employed for 37 years.

He joined the Arizona Power Company in 1924 as an engineer and served the company for 20 years as general superintendent. He became vice president of the company in 1948, and, after it was purchased and renamed the Northern Arizona Light and Power Company, he was elected vice president and general superintendent. He continued in the same position when this company merged with Arizona Public Service Company in 1953. In 1955 Mr. Bridgwater became vice president and manager of gas and electric operations. Upon his retirement in 1961, he established a consulting firm in Phoneix, Ariz.

Mr. Bridgwater received the B.S. degree from Texas A&M University in 1917. He had served as chairman of the Arizona Section of AIEE.

95

Campopiano, Carmen N.; SPEC 70 Mar 117-118 (3B04). Review of Brown, William M., and Carmen J. Palermo; Random Processes, Communications and Radar.
Chafaris, George J.; SPEC 70 Nor 93 (2E07). Review of Sherr, Sol; Fundamentals of Display System Engineering.
Cho, Susumu, and Alan G. Thiele; The low-power-drain microelectronic VHF amplifier; SPEC 70 Mar 49-53 (1F05)
Cobine, James D.; SPEC 70 Mar 116 (3B03). Review of Thomson, J. J., and G. P. Thomson; Conduction of Electricity Through Gases—Vols. I and II.

I and II.

Cobine, James D.; SPEC 70 Oct 102–103 (3B05). Review of Weston, G. F.; Cold Cathode Glow Discharge Tubes.
Cohen, Ernest M.; SPEC 70 Aug 105 (2F01). Review of Minorsky, Nicolai;

Cohen, Ernest M.; SPLC 10 Aug 105 (2F01). Review of Minorsky, Nicolai; Theory of Nonlinear Control Systems.

Coker, Cecil H., see Flanagan, James L., SPEC 70 Oct 22–45

Conley, Patrick; Experience curves as a planning tool; SPEC 70 Jun 63–68 (2C05)

63-68 (2C05)
Corry, Andrew F., see Avila, Charles F., SPEC 70 Mar 42-48
Critchlow, Arthur J.; SPEC 70 Aug 105 (2F01). Review of Perkins, William R., and Jose B. Cruz, Jr.; Engineering of Dynamic Systems.
Correction, SPEC 70 Oct 105
Curtis, H. Allen; SPEC 70 Jul 99 (2F01). Review of Unger, Stephen H.;
Asynchronous Sequential Switching Circuits.

### D

Dalziel, Charles Francis; Transistorized ground-fault interrupter reduces shock hazard; SPEC 70 Jan 55-62 (2C12)

Darmstadter, Joel; International flow of energy sources; SPEC 70 May 67-72 (2C06)

DeFalco, John A.; Reflection and crosstalk in logic circuit interconnections; SPEC 70 Jul 44-50 (1E11)
Comments by M. Abel-latif, and M. J. O. Strutt, and author's reply,
SPEC 70 Nov 11

SPEC 70 Nov 11

DeWitt, David; Spectral lines: Statement from the new Editor; SPEC 70 Sep 21 (1C12)

Dickey, Lee D., and Clyde M. Jones; Solid-state switching for aircraft electric systems; SPEC 70 Nov 73-79 (2C11)

Dopulos, Peter; SPEC 70 Aug 105 (2F01). Review of Kolstad, C. Kenneth; Rapid Electrical Estimating and Pricing.

Dror, Yehezkel; SPEC 70 Jan 104 (3C01). Review of Rudwick, Bernard H.; Systems Analysis for Effective Planning.

Duggan, Michael A.; SPEC 70 Sep 100-101 (2F06). Review of Mathison, Stuart L., and Philip M. Walker; Computers and Telecommunications: Issues in Public Policy.

Eddy, F. Neal; The exponential crisis; SPEC 70 Aug 53-56 (1F08)

Correction, SPEC 70 Oct 8

English, J. M.; SPEC 70 Aug 105-106 (2F01). Review of Middendorf,

William H.; Engineering Design.

Ewelt, Klaus Peter, see Meinert, Jens, SPEC 70 Jun 41-46

Fairthorne, Robert; SPEC 70 Jan 108-110 (3C05). Review of Salton Gerald; Automatic Information Organization and Retrieval.
Fink, Donald G.; Pension plans: The state of the art; SPEC 70 Nor 34-39 (1E01)
Flanagan, James L., Cecil H. Coker, Lawrence R. Rabiner, Ronald W. Schafer, and Noriko Umeda; Synthetic voices for computers; SPEC 70 Oct 22-45 (1D01)
Forney, G. David, Jr.; Coding and its application in space communications; SPEC 70 Jun 47-58 (2B01)
Forney, G. David, Jr.; SPEC 70 Nor 90 (2E04). Review of Turin, George L.; Notes on Digital Communication.
Franklin, Colin A.; SPEC 70 Sep 99 (2F05). Review of Gray, Paul E., and Campbell L. Searle; Electronic Principles—Physics, Models and Circuits.

Friedlander, Gordon D.; The Burndy Library: Window on the history of

Friedlander, Gordon D.; The Burndy Library: Window on the history of science; SPEC 70 Mar 54-64 (2B01)
Friedlander, Gordon D.; At the crossroads in air-traffic control:
1—The view from the ground; SPEC 70 Jun 26-40 (1D05) Correction, SPEC 70 Aug 10 Comments by James C. Nelson, SPEC 70 Oct 6
11—The view from the ground (continued); SPEC 70 Jul 69-83 (2C07)
111-View from the cockpit; SPEC 70 Aug 76-89 (2C08)
Friedlander, Gordon D.; Power, pollution, and the imperiled environment.

ment: Part 1, SPEC 70 Nov 40-50 (1E07) Part 11, SPEC 70 Dec 65-75 (2B08)

Galt, J. K.; SPEC 70 Oct 100 (3B03). Review of Kane, Philip F., and Graydon B. Larrabee; Characterization of Semiconductor Materials. Garrett, Lane S.; Integrated-circuit digital logic families:

1—Requirements and features of a logic family; RTL, DTL, and HTL devices; SPEC 70 Oct 46–58 (2B01)

11—TTL devices; SPEC 70 Nov 63–72 (2C01)

111—ECL and MOS devices; SPEC 70 Dec 30–42 (1D09)

Geffe, Philip R.; Toward high stability in active filters; SPEC 70 May 63–66 (2C02)

Gerry, Edward T.; Gasdynamic lasers. SPEC 70 Nov 51–58 (2B01)

Gersho, Allen; SPEC 70 Jul 100 (2F02). Review of Rohrer, Ronald A.; Circuit Theory: An Introduction to the State Variable Approach.

Ghandi, Sorab K.; SPEC 70 Apr 104, 106 (2F02). Review of Wolf, Helmut

F.; Silicon Semiconductor Data.

Gibson, John E.; Planning the coordination of ground transport; SPEC 70 Oct 79–86 (2D10)

Goldberg, Fred N.; SPEC 70 Sep 100 (2F06). Review of Pennington, Ralph H.; Introductory Computer Methods and Numerical Analysis

(2nd Edition).

Goldmark, Peter C.; Color EVR; SPEC 70 Sep 22–33 (1D01)

Golembeski, J. J.; SPEC 70 Oct 98–100 (3B01). Review of Strauss, Leonard; Wave Generation and Shaping (2nd Edition).

Gorski-Popiel, Jerzy; SPEC 70 Mar 114, 116 (3B01). Review of Mitra, S. K.; Analysis and Synthesis of Linear Active Networks.

Gott, Vincent; SPEC 70 Jul 96, 98 (2E10). Review of Myers, G. H., and V. Parsonnet; Engineering in the Heart and Blood Vessels.

Gould, Richard G., and George K. Helder; Transmission delay and echo suppression; SPEC 70 Apr 47–54 (1F03)

Gourishankar, V.; SPEC 70 Aug 107 (2F03). Review of Chu, Yaohan; Digital Simulation of Continuous Systems.

Grace, Donald J., see Pettit, Joseph M., SPEC 70 May 73–80

Gran, Richard; SPEC 70 Oct 103 (3B06). Review of Fuller, A. T. (Ed.); Nonlinear Stochastic Control Systems.

Granger, J. V. N.; President's address at the 1970 Convention banquet;

Nonlinear Stochastic Control Systems.

Granger, J. V. N.; President's address at the 1970 Convention banquet; 
SPEC 70 May 22-23 (1D02)

Granger, J. V. N. (President), Raymond W. Sears (Secretary/Treasurer), 
and Price Waterhouse & Co. (Auditors); 1EEE reports for 1969; 
SPEC 70 Jun 74-86 (2D04)

Granger, J. V. N.; The employment problem: Can 1EEE help? SPEC 
70 Nov 32-33 (1D11)

Granger, Elliest 1. SPEC 70 Jul 100 (2E02). Persign of Committee 1.

Gruenberg, Elliot L.; SPEC 70 Jul 100 (2F02). Review of Committee on Remote Sensing for Agricultural Purposes, National Research Council; Remote Sensing—with Special Reference to Agriculture

and Forestry.

Gunshor, R. L.; SPEC 70 Oct 101-102 (3B04). Review of Steele, Martin C., and Bayram Vural; Wave Interactions in Solid State Plasmas.

Hamming, R. W.; SPEC 70 Jul 99 (2F01). Review of Skilling, Hugh H.; Do You Teach?—Views on College Teaching.
Hansen, R. C.; SPEC 70 May 100-102 (2F03). Review of Collin, Robert E., and Francis J. Zucker; Antenna Theory, Parts I and II.
Hansen, Robert W.; SPEC 70 May 99 (2F02). Review of National Association of Relay Manufacturers; Engineers' Relay Handbook (Revised Second Edition) No. 5867.
Happ, Harvey H.; SPEC 70 Aug 107 (2F03). Review of Harary, Frank; Graph Theory.

Happ, Harvey H.; SPEC 70 Aug 107 (2F03). Review of Harary, Frank; Graph Theory.
Harmuth, Henning F.; Applications of Walsh functions in communications; SPEC 69 Nov 82-91
Comments by J. Rodney M. Vaughan, SPEC 70 Mar 6, 8 (1B10)
Harrington, Roger F.; SPEC 70 Oct 100-101 (3B03). Review of King, Ronald W. P., and Charles Harrison, Jr.; Antennas and Waves: A Modern Approach.
Harris, F. K.; SPEC 70 Feb 116 (3B03). Review of Karsa, B. E. F.; Electrical Measuring Instruments and Measurements.
Harris, Miles F.; SPEC 70 Nov 90-91 (2E04). Review of Lusignan, Bruce B., and John R. Kieley; Global Weather Prediction: The Coming Revolution.

Revolution.

Revolution.
Haviland, Robert P.; Why space broadcasting? SPEC 70 Feb 86-91 (2D07)
Heffner, Hubert; Science in the seventies—the policy issues; SPEC 70
Jul 31-34 (1D10)
Heilmeier, George H.; SPEC 70 Jul 99-100 (2F01). Review of Kallard,
Thomas (Ed.); Liquid Crystals and Their Applications.
Helder, George K., see Gould, Richard G., SPEC 70 Apr 47-54
Henney, Keith; SPEC 70 May 100 (2F03). Review of Shore, Bruce H.;
The New Electronics.
Herold, Edward W.; Spectral lines: Convention progress; SPEC 70 Jun

Herold, Edward W.; Spectral lines: Convention progress; SPEC 70 Jun

25 (1D04) Herold, Edward W.; Spectral lines: What we can do; SPEC 70 Nor 31

(1D10) Herold, Edward W.; Spectral lines: What we must do; SPEC 70 Jul 23

Herold, Edward W.; Spectral lines; What we must do; SPEC 70 Jul 23 (1D02)

Hochman, Herschel T., and Dennis L. Hogan; Technological advances in large-scale integration; SPEC 70 May 50–58 (2B01)

Correction, SPEC 70 Jul 9

Hodges, David A.; Spectral lines: What more can IEEE do for young engineers?; SPEC 70 Oct 21 (1C12)

Hogan, Dennis L., see Hochman, Herschel T., SPEC 70 May 50–58

Holland, Richard, see Land, Cecil A., SPEC 70 Feb 71–78

Holland, Richard; Piezoelectric effects in ferroelectric ceramics; SPEC 70 Apr 67–77 (2C01)

Holonyak, Nick, Jr.; SPEC 70 Oct 98 (3B01). Review of Hunter, Lloyd P. (Ed.); Handbook of Semiconductor Electronics (3rd Edition).

Holst, Per A.; SPEC 70 Sep 98 (2F04). Review of Williams, T. J., and F. M. Ryan (Eds.); Progress in Direct Digital Control.

Howell, Richard P.; Aerospace nomads: How professionals move; SPEC 70 Jan 32–41 (2B01)

Hsiao, Henry S., and Charles Susskind; Infrared and microwave communication by moths; SPEC 70 Mar 69–76 (2C04)

Comments by Eric R. Laithwaite, SPEC 70 Aug 8, 10

Huang, K. T.; Desensitization of de power supplies to momentary ac power fluctuations; SPEC 70 Jun 69–73 (2C11)

Jansen, J.; EHV lines in the Federal Republic of Germany; SPEC 70
Apr 33-40 (1E01)

Johnson, Charles M.; Ballistic-missile defense radars; SPEC 70 Mar 32-41 (1D12)

Johnson, Harwick; The anatomy of integrated-circuit technology; SPEC 70 Feb 56-66 (2B01)

Jones, Clyde M., see Dickey, Lee D., SPEC 70 Nov 73-79

Jordan, John F.; From engineer to entrepreneur: Financing the transition; SPEC 70 Feb 40-41 (1E08)
 Jurgen, Ronald K.; Minicomputer applications in the seventies (Report); SPEC 70 Aug 37-52 (1E04)

Kabak, Irwin W., and Jay E. Strum; SPEC 70 Aug 105 (2F01). Review of Niland, Powell; Production Planning, Scheduling, and Inventory Control: A Text and Cases.
Kahn, Arnold H.; SPEC 70 Jun 107 (3B05). Review of Landsberg, P. T. (Ed.); Solid State Theory: Methods and Applications.
Kanal, Laveen N.; SPEC 70 Sep 102-103 (2F08). Review of Forsythe, A. I., T. A. Keenan, E. I. Organick, and W. Stenberg; Computer Science: (4 vols.): A First Course; A Primer; Fortran Language Programming; Teacher's Commentary.
Kesner, Don; Monolithic voltage regulators; SPEC 70 Apr 24-32 (1D04) Correction, SPEC 70 Jun 9
Kieburtz, R. Bruce; SPEC 70 Jan 110 (3C07). Review of Bennion, D. R., H. D. Crane, and David Nitzan; Digital Magnetic Logic.
Kinner, Howard R.; SPEC 70 Sep 102 (2F08). Review of Altman, Manfred; Elements of Solid-State Energy Conversion.
Koivo, A. J.; SPEC 70 Jan 110-111 (3C07). Review of National Technical Organizing Committee (Ed.); Proceedings of the IFAC Symposium on Pulse-Rate and Pulse-Number Signals in Automatic Control.
Konnerth, Karl L., and Bankim R. Shah; Optical transmission utilizing injection lights courses: SPEC 70 Sep 31 A6 (1F04)

Konnerth, Karl L., and Bankim R. Shah; Optical transmission utilizing injection light sources; SPEC 70 Sep 37-46 (1E04)
 Kopp, Richard E.; SPEC 70 Dec 88 (2D07). Review of Beveridge, Gordon S. G., and Robert S. Schechter; Optimization: Theory and Practice.

Lainiotis, Demetrios G.; SPEC 70 May 98-99 (2F01). Review of McMullen, C. W.; Communication Theory Principles.
Laithwaite, Eric R.; SPEC 70 Aug 8, 10 (1B11)
Comments on Hsiao, Henry S., and Charles Susskind; Infrared and microwave communication by moths; SPEC 70 Mar 69-76
Land, Cecil A., and Richard Holland; Electrooptic effects in ferroelectric ceramics; SPEC 70 Feb 71-78 (2C04)
Letzter, Seymour, and Norman Webster; Noise in amplifiers; SPEC 70 Aug 67-75 (2B11)
Levine Richard C.; SPEC 70 Apr 102 (2E12). Review of Wedlock, Bruce D., and J. K. Roberge; Electronic Components and Measurements.
Linck, H.; SPEC 70 Jan 106 (3C03). Review of Rudenberg, Reinhold; Transient Performance of Electric Power Systems.
Lincoln, E. S.; SPEC 70 Jun 108-109 (3B06). Review of Dunsheath, Percy:

Lincoln, E. S.; SPEC 70 Jun 108-109 (3B06). Review of Dunsheath, Percy; A History of Electrical Power Engineering.

Lonngren, Karl E.; SPEC 70 Jul 101 (2F03). Review of Rabinowicz, Ernest; An Introduction to Experimentation.

MacDonald, John N.; SPEC 70 Aug 107 (2F03). Review of Wylie, F. J.; Choosing and Using Ship's Radar—A Brief Guide.

Maclean, A. L.; SPEC 70 Jan 104-105 (3C01). Review of Hodge, B., and R. N. Hodgson; Management and the Computer in Information and Control Systems.

Macy, Josiah, Jr.; SPEC 70 Jan 106, 108 (3C03). Review of Plonsey, Robert; Bioelectric Phenomena.

Robert; Bioelectric Phenomena.
Manasse, Fred K.; Getting engineering students involved—the Dartmouth/Tuskegee program; SPEC 70 Dec 59-64 (2B02)
Marchand, Nathan; SPEC 70 Dec 88 (2D07). Review of Martin, James; Teleprocessing Network Organization.
Marcuvitz, N.; SPEC 70 Mar 116-117 (3B03). Review of Schwinger, Julian, and David S. Saxon; Discontinuities in Waveguides (Notes on Lectures by Julian Schwinger).
McCormick, E. M.; SPEC 70 Feb 114 (3B01). Review of Jordain, P. B.; Condensed Computer Encyclopedia.

Condensed Computer Encyclopedia.

McCormick, John E.; SPEC 70 Apr 106-107 (2F04). Review of Harper, Charles A. (Ed.); Handbook of Electronic Packaging.

McCue, J. J. G.; Spectral lines: Thoughts on being nonnational; SPEC 70 Jan 31 (1F03)

McCue, J. J. G.; Spectral lines: The 1970 Convention; SPEC 70 Feb 39 (1E07)

McCue, J. J. ( 31 (1D11) J. G.; Spectral lines: Engineers and revolution; SPEC 70 Mar

31 (1D11)

McGeechan, John J.; SPEC 70 Sep 97 (2F03). Review of Blanchard, B. S., Jr., and E. E. Lowery; Maintainability: Principles and Practices.

Meinert, Jens, and Klaus Peter Ewelt; A modernized electric network for the future needs of Hamburg; SPEC 70 Jun 41-46 (1E08)

Michaelson, Herbert B.; SPEC 70 Jun 108 (3B06). Review of Dodds, R. H.; Writing for Technical and Business Magazines.

Miller, William A.; SPEC 70 Jun 107 (3B05). Review of Kingslake, R. (Ed.); Applied Optics and Optical Engineering—A Comprehensive Treatise.

Miller, William A.; SPEC 70 Jun 107 (3B05).

Treatise.

Miller, William A.; SPEC 70 Aug 106 (2F02). Review of Vabre, Jean-Paul; Pulse Electronics—Vol. III: Pulse Generators (in French).

Miller, William A.; SPEC 70 Apr 104 (2F02). Review of Webb, R. H.; Elementary Wave Optics.

Mimno, Harry Rowe; SPEC 70 Jun 104 (3B02). Review of Jackson, William E. (Ed.); The Federal Airways System.

Molz, K. F.; SPEC 70 Jun 108 (3C05). Review of Barton, D. K., and H. R. Ward; Handbook of Radar Measurement.

Moore, Arthur D.; SPEC 70 Mar 114 (3B01). Review of Alger, P. L.; The Life and Times of Gabriel Kron.

Moschytz, George S.; Inductorless filters—A survey:

1—Electromechanical filters; SPEC 70 Aug 30-36 (1D09)

11—Linear active and digital filters; SPEC 70 Sep 63-75 (2C05)

Moschytz, George S.; The operational amplifier in linear active networks; SPEC 70 Jan 42 50 (2B11) Correction, SPEC 70 Sep 10

Narasimhan, T. R.; SPEC 70 Jul 100-101 (2F02). Review of Haykin, S. S.; Synthesis of RC Active Filter Networks.

Nelson, James C.; SPEC 70 Oct 6 (1B09)

Comments on Friedlander, Gordon B; At the crossroads in air-traffic

control; SPEC 70 Jun 26-40
Neurath, Peter W.; SPEC 70 Mar 118 (3B05). Review of Electronics/
Management Center; Proceedings of the First National Conference

Management Center; Proceedings of the First National Conference on Electronics in Medicine.

Nickerson, R. S.; SPEC 70 Dec 86 (2D05). Review of Rosenblueth, Arturo; Mind and Brain: A Philosophy of Science.

Nodelman, Henry M.; SPEC 70 Jun 104-105 (3B02). Review of Paul, Richard S., and M. Leonard Shaevel; Contemporary Technical Mathematics with Calculus.

Noon, J. H.; SPEC 70 Sep 99-100 (2F05). Review of Hartnagel, Hans; Semiconductor Plasma Instabilities.

Ohigashi, Hideo; Man-machine conversational data communication systems; SPEC 70 Mar 77-82 (2C12)
Oliver, Frank J.; SPEC 70 Aug 106 (2F02). Review of Dummer, G. W. A.; Materials for Conductive and Resistive Functions.
Oppenheim, Alan V.; SPEC 70 Mar 116 (3B03). Review of Harmuth, H.; Transmission of Information of Orthogonal Functions.
Oppenheim, Alan V.; Speech spectrograms using the fast Fourier transform; SPEC 70 Aug 57-62 (2B01)
Oroshnik, Jesse; SPEC 70 Jan 105-106 (3C02). Review of Chopra, Kasturi L.; Thin Film Phenomena.
Owens, C. Dale; SPEC 70 Jun 107-108 (3B05). Review of Snelling, E. C.; Soft Ferrites—Properties and Applications.

Soft Ferrites-Properties and Applications.

Park, James R.; SPEC 70 Jan 105 (3C02). Review of Borsky, V., and J. Matyas; Computation by Electronics Analogue Computers.
Parkins, William E., see Prem, Lawrence L., SPEC 70 May 35-44
Pell, Arthur R.; Laid off!; SPEC 70 Sep 34-36 (1E01)
Penick, Dixon B.; SPEC 70 Jul 98-99 (2E12). Review of Cattermole, K. W.; Principles of Pulse Code Modulation.
Perlman, Stuart S.; SPEC 70 Jun 106 (3C03). Review of Tickle, A. C.; Thin-Film Transistors—A New Approach to Microelectronics.
Pettit, Joseph M., and Donald J. Grace; The Stanford instructional television network; SPEC 70 May 73-80 (2C12)
Poloujadoff, Michel; The Esclangon diagram for voltage and current along a transmission line; SPEC 70 Feb 92-94 (2E01).
Ponte, Maurice; The role of the engineer in public affairs; SPEC 70 Jul 51-58 (2B01)
Potts, John S.; SPEC 70 Mar 118-119 (3B05). Review of Kurokawa, K.;

Ponte, Maurice; The role of the engineer in public aliairs; SPEC 70 Jul 51-58 (2B01)
Potts, John S.; SPEC 70 Mar 118-119 (3B05). Review of Kurokawa, K.; An Introduction to the Theory of Microwave Circuits.
Prem, Lawrence L., and William E. Parkins; Outlook for binary power plants using liquid-metal MHD; SPEC 70 May 35-44 (1E03) Correction, SPEC 70 Jul 9
Price Waterhouse & Co. (Auditors), see Granger, J. V. N. (President), SPEC 70 Jun 74-86
Pritchard, R. L.; SPEC 70 Dec 87-88 (2D06). Review of Sha, A., F. Pellandini, and A. Birolini; Grundschaltungen mit Transistoren (Basic Transistor Circuits).
Proakis, John; SPEC 70 Jul 98 (2E12). Review of Schwartz, Mischa; Information Transmission, Modulation, and Noise (2nd Edition).
Punchard, J. C. Reginald; What's ahead in communications?; SPEC 70 Jan 51-54 (2C08)
Purdy, Robert J.; SPEC 70 Sep 98-99 (1F04). Review of Nathanson, Fred E.; Radar Design Principles; Signal Processing and the Environment. vironment.

Rabiner, Lawrence R., see Flanagan, James L., SPEC 70 Oct 22-45
Reid, Robert L.; SPEC 70 May 99-100 (2F02). Review of Leach, Donald P.; Basic Electric Circuits.

Rennekamp, Eugene; SPEC 70 Sep 98 (2F04). Review of McHale, John; The Future of the Future.

Reider, W.; Circuit breakers—Physical and engineering problems:

1—Fundamentals; SPEC 70 Jul 35-43 (1E02)

11—Design considerations; SPEC 70 Aug 90-94 (2D10)

111—Are-medium considerations; SPEC 70 Sep 80-84 (2D10)

Rines, Robert H.; A plea for a proper balance of proprietary rights; SPEC 70 Apr 41-46 (1E09)

Rosenblatt, Joan R.; SPEC 70 Sep 102 (2F08). Review of Bose, R. C., I. M. Chakravarti, P. C. Mahalanobis, C. R. Rao, and K. J. C. Smith; Essays in Probability and Statistics.

Ross, William J.; SPEC 70 May 102 (2F04). Review of Davies, Kenneth; Ionospheric Radio Waves.

Rudin, Harry, Jr.; Data transmission: A direction for future development; SPEC 70 Feb 79-85 (2C12)

Sarasohn, H. M.; SPEC 70 Sep 101-102 (2F07). Review of Scott, Ellis L., and Roger W. Bolz (Eds.); Automation and Society.

Savet, Paul II.; SPEC 70 Nov 92 (2E06). Review of Kuo, Benjamin C.;

Savet, Paul II.; SPEC 70 Nov 92 (2E06). Review of Kuo, Benjamin C.; Discrete-Data Control Systems.
Scales, John I.; SPEC 70 Jim 108 (3B06). Review of Greig, Denis; Electrons in Metals and Semiconductors.
Schafer, Ronald W., see Flanagan, James L., SPEC 70 Oct 22-45
Schell, Allen C.; SPEC 70 Sep 96-97 (2F02). Review of Zakharyev, L. N., A. A. Lemanski, K. S. Shcheglov, and Petr Beckmann (Translator); Radiation from Apertures in Convex Bodies.
Schindler, H. R.; Delta modulation; SPEC 70 Oct 69-78 (2C12)
Sears, Raymond W. (Secretary/Treasurer), see Granger, J. V. N. (President), SPEC 70 Jim 74-86.
Senders, John W.; SPEC 70 Jan 105 (3C02). Review of Orr, William D. (Ed.); Conversational Computers.
Senders, John W.; SPEC 70 Jan 105 (3C02). Review of Siegel, Arthur I., and J. Jay Wolf; Man-Machine Simulation Models.
Shah, Bankim, R., see Konnerth, Karl L., SPEC 70 Sep 37-46
Shiers, George; Early schemes for television; SPEC 70 May 24-34 (1D04)
Smith, Fred B.; SPEC 70 Mar 118 (3B05). Review of Melsa, J. L., and D. G. Schultz; Linear Control Systems.
Soanes, Sidney Vincent; A philatelic history of electrical science; SPEC 70 Jan 80-85 (2F01)
Sorenson, Harold W.; Least-squares estimation: From Gauss to Kalman; SPEC 70 Jul 63-68 (2C01)
Steiglitz, Kenneth; SPEC 70 Jul 96 (2E10). Review of Gold, Bernard, and Charles M. Radar; Digital Processing of Signals.
Stroke, George W.; SPEC 70 Dec 86-87 (2D05). Review of Metherell, A. F., and Lewis Larmore: Acoustical Holography, Vol. 2.
Strum, Jay E., see Kabak, Irwin W., SPEC 70 Aug 105
Strutt, M. J. O., see Abdel-latif, M., SPEC 70 Mar 69-76
Susskind, Charles; The carly history of electronics—V: Commercial be-

Susskind, Charles, see Hsiao, Henry S., SPEC 70 Mar 69-76
Susskind, Charles; The early history of electronics—V: Commercial beginnings; SPEC 70 Apr 78-83 (2C12)
Susskind, Charles; The early history of electronics—VI; Discovery of the electron; SPEC 70 Sep 76-79 (2D06)

### T

Tannenwald, P. E.; SPEC 70 Oct 98 (3B01). Review of Unger, H. G.; Introduction to Quantum Electronics.
Taub, J.; SPEC 70 Nov 91–92 (2E05). Review of Smith, Phillip H.; Electronic Applications of the Smith Chart: In Waveguide, Circuit, and Component Analysis.

Tilson Seymour; Pulsars may be neutron stars; SPEC 70 Feb 42-55

(1E10)

Tolles, Walter E.; SPEC 70 Jul 96 (2E10). Review of Schwan, Herman P. (Ed.); Biological Engineering.

Tow, James; A step-by-step active-filter design; SPEC 69 Dec 64–68

Correction, SPEC 70 Feb 9

### U

Ullmann, John E.; Conversion and the import problem: A confluence of opportunities; SPEC 70 Apr 55-62 (2B01)
 Umeda, Noriko, see Flanagan, James L., SPEC 70 Oct 22-45

### SUBJECT INDEX

ABM; cf. Safeguard Ballistic-Missile Defense system

Acoustic undersea communication; effects of absorption and multipath distortion on bandwidth. Anderson. Victor C., SPEC 70 Oct 63-68

Active filters; design method based on conventional passive filter design. Tow, James, SPEC 69 Dec 64-68

Active filters; inductorless design. Moschytz, George S., SPEC 70 Sep 63-75

63-75
Active filters; low-sensitivity circuits; stability. Geffe, Philip R., SPEC 70

May 63-66

Active networks; integrated operational amplifiers in linear networks; analysis. Moschytz, George S., SPEC 70 Jan 42-50

Aerospace corporations; conversion from military to commercial work; international trade. Ullmann, John E., SPEC 70 Apr 55-62

Aircraft electric systems; solid-state switching. Dickey, Lee D., SPEC 70 Nov 73-70

Nov 73-79

Air-traffic control; automated ground-control systems; operational experience and future plans. Friedlander, Gordon B., SPEC 70 Jun 26-40

26-40
 Air-traffic control; ground systems; FAA plans for present decade. Friedlander, Gordon D., SPEC 70 Jul 69-83
 Air-traffic control; on-board instrumentation; human factors. Friedlander, Gordon D., SPEC 70 Aug 76-89
 Amplifiers; noise; inherent problems and signal-to-noise ratio improvement. Letzter, Seymour, SPEC 70 Aug 67-75
 Amplifiers; cf. Operational amplifiers; VHF amplifiers
 Antiballistic missile systems; cf. Safeguard Ballistic-Missile Defense system

system

Arcs; circuit breakers; arc medium considerations. Rieder, W., SPEC 70 Sep 80-84

Arcs; circuit-breakers; arc phenomena and arc media. Rieder, W., SPEC 70 Jul 35-43

Ballistic-missile defense; cf. Safeguard Ballistic-Missile Defense system

Van Valkenburg, M. E.; Spectral lines: Can industry help?; SPEC 70 Apr 23 (11)03)

23 (11003)

Van Veen, Frederick; SPEC 70 Oct 102 (3B05). Review of Edgerton, Harold E.; Electronic Flash, Strobe.

Vaughan, J. Rodney M.; SPEC 70 Mar 6, 8 (1B10)

Comments on Harmuth, Henning F.; Applications of Walsh functions in communications; SPEC 69 Nor 82-91

Veinott, Cyril G.; SPEC 70 Sep 97-98 (2F03). Review of Lloyd, Tom Cox; Electric Motors and Their Applications.

Walker, Geoffrey F.; Applications of a dc constant-current source; SPEC 70 Sep 47-58 (2B01)
Ward, Harold R.; SPEC 70 Nov 91 (2E05). Review of Skolnik, Merrill;

Ward, Harold R.; SPEC 70 Nov 91 (2E05). Review of Skolnik, Merrill; Radar Handbook.
Webster, Norman, see Letzter, Seymour, SPEC 70 Aug 67-75
West, Corlin II.; SPEC 70 Jun 106-107 (3B04). Review of Faiman, M., and J. Nievergelt (Eds.); Pertinent Concepts in Computer Graphs—Proceedings of the Second University of Illinois Conference on Computer Graphics.
Westcott, Vernon C.; SPEC 70 Sep 97 (2F03). Review of Norton, Harry N.; Handbook of Transducers for Electronic Measuring Systems.
Whicker, Lawrence R.; SPEC 70 Oct 100 (3B03). Review of Physical Society of Japan; Proceedings of the Second International Meeting on Ferroelectricity.

Windsel, Lawfelice R.; SPEC 70 Oct 100 (3803). Review of Physical Society of Japan; Proceedings of the Second International Meeting on Ferroelectricity.
Whittaker, John R.; SPEC 70 Feb 114, 116 (3801). Review of Spottiswoode, Raymond (Ed.); The Focal Encyclopedia of Film and Television Techniques.
Willems, Jan E.; SPEC 70 Sep 96 (2F02). Review of Lublin, Yale Jay; Filter Systems and Design: Electrical, Microwave, and Digital.
Willems, Jan E.; SPEC 70 Sep 96 (2F02). Review of Lublin, Yale Jay; Filter Systems and Design: Electrical, Microwave, and Digital.
Willembrock, F. Karl; Spectral lines: Engineering—an "open profession"; SPEC 70 Aug 29 (1D08)
Wilmotte, Raymond M; Engineering truth in competitive environments; SPEC 70 May 45–49 (1F01)
Winogradoff, Nicholas N; SPEC 70 Mar 119 (3B06). Review of Schwartz, Bertram (Ed); Ohmic Contacts to Semiconductors.
Winogradoff, Nicholas N; SPEC 70 May 100 (2F03). Review of Gooch, C. H. (Ed.); Gallium Arsenide Lasers.
Wisz, T. E.; SPEC 70 Oct 102 (3B05). Review of Malvino, Albert Paul; Calculus for Electronics.
Woollett, R. S.; SPEC 70 Nov 93 (2E07). Review of Committee on Underwater Telecommunication; Present and Future Civil Uses of Underwater Sound.
Wyndrum, Ralph W., Jr.; SPEC 70 Feb 114 (3B01). Review of Hibberd,

Wyndrum, Ralph W., Jr.; SPEC 70 Feb 114 (3B01). Review of Hibberd, R. G.; Integrated Circuits, A Basic Course for Engineers and Technicians.

Yousif, Salah M.; SPEC 70 Sep 100 (2F06). Review of Bromberg, P. V.;
Matrix Analysis of Discontinuous Control Systems.
Yu, Albert Y. C.; The metal-semiconductor contact: An old device with a new future; SPEC 70 Mar 83–89 (2D06)

Bibliographies; inductorless filters; electromechanical, active, and digital filters. Moschytz, George S., SPEC 70 Sep 63-75
Biocommunication; moths; infrared and microwave communication.

Hsiao, Henry S., SPEC 70 Mar 69-76

### BOOK REVIEWS

Acoustic holography; state-of-the-art. Metherell, A. F. and Lewis Larmore (Eds.), Plenum Publishing Corp. 1970. See Stroke, George W. Active networks; analysis and synthesis. Mitra, S. K., John Wiley & Sons 1969. See Gorski-Popiel, Jerzy

Adaptive control; mathematical techniques. Yakowitz, Sidney J., American Elsevier 1969. See Bristol, Edgar H.

Analog computer programming. Borsky, V., American Elsevier 1969. See Park, James R. Antenna theory. Collin, Robert E., McGraw-Hill 1969. See Hansen,

Robert C. Antenna theory; reference book. King, Ronald W. P., M.I.T. Press 1970.

See Harrington, Roger F.

Aperture antennas located on metallic surfaces; radiation characteristics.

Zakharyev, L. N., Golem Press 1970. See Schell, Allen C.

Asynchronous sequential circuits. Unger, Stephen H., John Wiley & Sons 1969. See Curtis, H. Allen

Automation; social implications. Scott, Ellis L. (Ed.), Center for the Study of Automation and Society 1969. See Sarasohn, H. M. Bioelectrical phenomena; textbook. Plonsey, Robert, McGraw-Hill 1969. See Macy, Josiah, Jr.

Biomedical engineering; electronics and computer applications in medi-cine; conference proceedings. Electronics/Management Center McGraw-Hill 1969. See Neurath, Peter W.

Biomedical engineering. Schwan, Herman P. (Ed.), McGraw-Hill 1969. See Tolles, Walter E.

Calculus; introductory-level textbook for electronics technicians. Malvino, Albert Paul, John Wiley & Sons 1969, See Wisz, T. E.

College teaching; views of 14 Stanford University staff members. Skilling, Hugh H., Holt, Rinehart and Winston 1969. See Gott, Vincent

Communication theory; modulation. Schwartz, Mischa, McGraw-Hill 1970-See Proakis, John

Communication theory; undergraduate test. McMullen, C. W., Macmillan 1968. See Lainiotis, Demetrios G.

Computer applications. Orr, William D. (Ed.), John Wiley & Sons 1968. See Senders, John W

Computer graphics; conference proceedings. Faiman, M. (Ed.), University of Illinois Press 1969. See West, Corlin H.

Computer methods and numerical analysis. Pennington, Ralph H., Mac-

millan 1970. See Goldberg, Fred N.

Computer science; introductory text and teacher's supplement. Forsythe, A. I., John Wiley & Sons 1969. See Kanel, Laveen N.

Computer systems; introductory book for nonspecialists. Flores, Ivan, Prentice-Hall 1969. See Affel, Herman A., Jr.

Computer utilities and communications carriers; public policy on interdependence. Mathison, Stuart L., Prentice-Hall 1970. See Duggan, Michael A.

Michael A.

Conductive and resistive materials; physics and applications. Dummer, G.

W. A., Hayden 1970. See Oliver, Frank J.

Control system analysis; state-space methods. Melsa, J. L., McGraw-Hill
1969. See Smith, Fred B.

Cost estimation; electrical construction projects. Kolstad, C. Kenneth,
McGraw-Hill 1969. See Dopulos, Peter

Pata communication systems; references book. Martin Legacy B. 1981.

Data communication systems; reference book. Martin, James, Prentice-Hall 1969. See Barrow, Bruce B.

Data transmission systems and components. Martin, James, Prentice-Hall 1970. See Marchand, Nathan

Design methodology; component and systems design. Middendorf, William H., Allyn and Bacon 1969. See English, J. M.
Digital computer simulation of continuous systems. Chu, Yaohan, McGraw-

Hill 1969. See Gourishanker, V. Digital magnetic logic. Bennion, D. R., McGraw-Hill 1969. See Kieburtz,

R. Bruce Digital signal detection. Turin, George L., Van Nostrand Reinhold Co. 1969.

See Forney, G. David, Jr Digital signal processing. Gold, Bernard, McGraw-Hill 1969. See Steiglitz. Kenneth

Direct digital control; development and application in process industries. Williams, T. J. (Ed.), Instrument Society of America 1969. See Holst,

Per A.

Direct energy conversion. Altman, Manfred, Van Nostrand Reinhold 1969. See Kinner, Howard R.

Discharges; reprint of classic treatise. Thomson, J. J., Dover Publications 1969. See Cobine, James D.

Discrete-time systems; graduate text. Kuo, Benjamin C., Prentice-Hall 1970. See Savet, Paul H.

1970. See Savet, Paul H.

Displays; components and systems. Sherr, Sol, Wiley Interscience 1970.

See Chafaris, George J.

Electromagnetic field theory; undergraduate text. Durney, Carl H.,

McGraw-Hill 1969. See Asmussen, Jes

Electronic components; measurements and instrumentation. Wedlock,

Bruce D., Prentice-Hall 1969. See Levine, Richard C.

Encyclopedia; computer terms. Jordain, P. B., McGraw-Hill 1969. See

McCormick F M

McCormick, E. M.
Encyclopedia; TV and motion picture terms. Spottiswoode, Raymond (Ed.), Hastings House Publishers 1969. See Whittaker, John R.

(Ed.), Hastings House Publishers 1969. See Whittaker, John R.

Experimentation; role in engineering; measurement theory Rabinowicz, Ernest, Addison-Wesley 1970. See Lonngren, Karl E.

Fading dispersive channels; characterization and error rate. Kennedy, R. S., John Wiley & Sons 1969. See Bello, Phillip A.

Federal Airways System. Jackson, William E. (Ed.), IEEE G-AES 1970. See Mimno, Harry Rowe

Filter design; electrical, microwave, and digital filters. Lubkin, Yale Jay, Addison-Wesley 1970. See Willems, Jan E.

Flashlanps; photographic applications; book. Edgerton, Harold E., McGraw-Hill, 1970. See Van Veen, Frederick

FORTRAN programming. Forsythe, A. I., John Wiley & Sons 1970. See Kanel, Laveen N.

Kanel, Laveen N

Gabriel Kron; autobiography with contributions from friends, associates, and family. Alger, P. L., Mohawk Development 1969. See Moore, Arthur D

Gallium arsenide injection lasers; development and state of the art. Gooch, C. H. (Ed.), John Wiley & Sons 1969. See Winogradoff, Nicolas N.

Gas-discharge tubes. Weston, G. F., Transatlantic Arts 1968. See Cobine, James D.

Global observation network. Lusignan, Bruce B. and John R. Kieley (Eds.),
Holt, Rinehart and Winston 1970. See Harris, Miles F.

Graph theory. Harary, Frank, Addison-Wesley 1969. See Happ, Harvey H. Handbook; packaging of microelectronic circuits, tubes, and discrete components. Harper, Charles A. (Ed.), McGraw-Hill 1969. See McCormick, John E.

Handbook; radar. Skolnik, Merrill, McGraw-Hill 1970. See Ward, Harold

Handbook; radar measurement. Barton D. K., Prentice-Hall 1969. See

Handbook; radar measurement. Barton D. K., Prentice-Hall 1909. See Molz, K. F.
Handbook; relays; characteristics, applications, and specification guidelines. National Association of Relay Manufacturers, Hayden 1969. See Hansen, Robert W.
Handbook; transducers for measurement systems. Norton, Harry N., Prentice-Hall 1969. See Westcott, Vernon C.
History of electrical power engineering. Dunsheath, Percy, M.I.T. Press 1969. See Lincoln, E. S.
IFAC Symposium on Pulse-Rate and Pulse-Number Signals in Automatic Control, Budapest, Hungary, 1968; conference proceedings. National Technical Organizing Committee (Ed.), Hungarian Academy of Sciences 1968. See Koivo, A. J.
Information retrieval. Salton, Gerald, McGraw-Hill 1968. See Fairthorne.

Information retrieval. Salton, Gerald, McGraw-Hill 1968. See Fairthorne,

Instruments and measurements; dc and power frequencies. Karsa, B. E-F., Akademiai Kiado 1967. See Harris, F. K.

Integrated circuits; technology and applications; basic book for technicians. Hibberd, R. G., McGraw-Hill 1969. See Wyndrum, Ralph W.,

Ionospheric propagation; comprehensive introduction. Davies, Kenneth, Blaisdell Publishing Co. 1969. See Ross, William J.

Liquid crystals; state-of-the-art review and applications. Kallard, Thomas (Ed.), Optosonic Press 1970. See Heilmeier, George H.

Magnetic materials; properties and applications. Tebble, R. S., John Wiley & Sons 1969. See Bennett, Lawrence H.

Magnetic physics; contributions of Francis Bitter. Erber, T. (Ed.), M.I.T.

Press 1969. See Beiler, Adam Clarke

Maintenance engineering; principles and practices. Blanchard, B. S., Jr., McGraw-Hill 1969. See McGeechan, John J.
 Man-machine systems: digital computer simulation. Siegel, Arthur 1. and J. Jay Wolf, John Wiley & Sons 1969. See Senders, John W.
 Management information and control systems. Hodge, B., McGraw-Hill

1969. See Maclean, A. L.

Man's social role and position; the world community. McHale, John,
George Braziller 1969. See Rennekamp, Eugene

Marine radar; utilization as collision-avoidance device. Wylie, F. J.,
American Elsevier 1970. See MacDonald, John N.

Mathematics; technician-level textbook. Paul, Richard S., Prentice-Hall 1970. See Nodelman, Henry M. Mathematics for electrical engineers. Ortusi, J., Dunod 1969. See Bélanger,

P. R. Matrix analysis of discontinuous control systems. Bromberg, P. V., American

Elsevier 1969. See Yousif, Salah M.
Microwave circuits; analytical techniques. Kurokawa, K., Academic Press 1969. See Potts, John S.

Mind-brain relation; philosophy of science for mind-brain studies. Rosenblueth, Arturo, M. I. T. Press 1970. See Nickerson, R. S. Modern electronics; devices and systems. Shore, Bruce H., McGraw-Hill

1970. See Henney, Keith

Motors; characteristics and applications. Lloyd, Tom Cox, John Wiley & Sons 1970. See Veinott, Cyril G.

Network theory; undergraduate text. Leach, Donald P., John Wiley & Sons 1969. See Reid, Robert L.

Sons 1709. See Reid, Robert L.

Nonlinear control systems; analysis techniques. Minorsky, Nicolai, Mc-Graw-Hill 1969. See Cohen, Ernest M.

Nonlinear stochastic control. Fuller, A. T., Barnes & Noble 1970. See Gran, Richard

Oran, Remaid
Ohmic contacts to semiconductors. Schwartz, Bertram (Ed.), Electrochemical Society 1969. See Winogradoff, N. N.
Optimization; undergraduate text. Beveridge, Gordon S. G. and Robert S. Schechter, McGraw-Hill 1970. See Kopp, Richard E.
Optimization techniques. Pun, Lucas, John Wiley & Sons 1969. See Paleny George A.

Bekey, George A.

Optical instrumentation, Kingslake, R. (Ed.), Academic Press 1969. See Miller, William A. PCM principles. Cattermole, K. W., American Elsevier 1970. See Penick,

Dixon B.

Picture processing, Rosenfeld, Azriel, Academic Press 1969. See Bridgewater, Albert W.

Piezoelectric devices; ferroelectric ceramics. Holland, Richard, M.I.T.

Press 1969. See Brandt, Franklin R.

Plasma physics; cesium plasma, interstellar plasma, and shock waves in plasma. Simon, Albert (Ed.), John Wiley & Sons 1969. See Birdsall, Charles K.

Plasma physics research. Simon, Albert (Ed.), John Wiley & Sons 1969. See Bachynski, Morrel P.

Power system transients. Rudenberg, Reinhold, M.I.T. Press 1969. See Linck, H.

Linck, H.

Probability and statistics. Bose, R. C., University of North Carolina Press 1970. See Rosenblatt, Joan R.

Production planning; scheduling and inventory control. Niland, Powell, Macmillan 1970. See Kabak, Irwin W.

Prosthetic devices for cardiovascular system. Myers, G. H., John Wiley & Sons 1969. See Gott, Vincent

Pulse circuits; integrated circuits; undergraduate or early-graduate-level textbook. Strauss, Leonard, McGraw-Hill 1969. See Golembeski, J. J.

Pulse generation: solid-state circuits. Valve, Jean-Paul, Masson & Cie

Pulse generation; solid-state circuits. Vabre, Jean-Paul, Masson & Cie Editeurs 1970. See Miller, William A.

Quantum electronics; theoretical principles. Unger, H. G., Pergamon Press 1970. See Tannenwald, P. E.

Radar design for clutter environment. Nathanson, Fred E., McGraw-Hill 1969. See Purdy, Robert J.

Random processes, communication theory, and radar. Brown, William M., McGraw-Hill 1969. See Campopiano, Carmen N.

RC active filters; synthesis. Haykin, S. S., McGraw-Hill 1969. See Narasimhan, T. R.

Real-time systems for data processing; design and cost-performance analysis. Stimler, Saul, McGraw-Hill 1969. See Beam, Walter R.

Remote sensing for agriculture and forestry. Committee on Remote Sensing for Agricultural Purposes, National Research Council-National Academy of Sciences 1970. See Gruenberg, Elliot L.

Sampled-data systems; statistical dynamics. Krut'ko, Pyotr, American Elsevier 1969. See Koivo, A. J.

Second International Meeting on Ferroelectricity, Kyoto, Japan, 1969 Sep 4-9; conference proceedings. *Physical Society of Japan*, 1970. See Whicker, Lawrence R.

Semiconductor electronics; physics, models, and circuits. Gray, Paul E., John Wiley & Sons 1969. See Franklin, Colin A.
Semiconductor material characterization. Kane, Philip F., McGraw-Hill

1970. See Galt, J. K. Semiconductor plasma instabilities. Hartnagel, Hans, American Elsevier 1969. See Noon, J. H.

Signal representation using orthogonal functions; emphasis on Walsh functions. *Harmuth*, H., Springer-Verlag 1969. See Oppenheim, Alan

Silicon semiconductor data. Wolf, Helmut F., Pergamon Press 1969.

See Ghandi, Sorab K. Smith charts; applications to waveguide, circuit, and component analysis. Smith, Phillip H., McGraw-Hill 1969. See Taub, J.

Soft ferrites; properties and design procedures. Snelling, E. C., Chemical Rubber Co. 1969. See Owens, C. Dale

Solid-state physics; advanced textbook. Landsberg, P. T. (Ed.), John Wiley & Sons 1970. See Kahn, Arnold H.

Solid-state physics; introductory text. Greig. Denis, McGraw-Hill 1970. See Seales, John L.

State-space methods for linear time-invariant networks. Rohrer, Ronald A., McGraw-Hill 1970. See Gersho, Allen
System analysis. Rudwick, Bernard H., John Wiley & Sons 1969. See Dror,

Yehezkel

Ychezkel
Systems engineering. Perkins, William R., John Wiley & Sons 1969.
See Critchlow, Arthur J.
Thin-film phenomena and techniques; advanced reference book. Chopra,
Kasturi L., McGraw-Hill 1969. See Oroshnik, Jesse
Thin-film transistors for integrated circuits. Tickle, A. C., John Wiley &
Sons 1969. See Perlman, Stuart S.
Transistors circuits on investment circuits. Sha A. E. Pellundini, and I.

Transistor circuits; equivalent circuits. Sha, A., F. Pellandini, and L. Birolini, AMIV 1970. See Pritchard, R. L.

Ultrasonic applications in medical diagnosis. Wells, Peter N. T., Academic Press 1969. See Brown, Ross E.
Underwater sound; civil uses, present and future. Committee on Underwater Telecommunication, National Academy of Sciences 1970. See Woollett, R. S.

Wave interactions in solid-state plasma. Steele, Martin C., McGraw-Hill 1969. See Gunshor, R. L. Wave optics; undergraduate text. Webb, R. H., Academic Press 1969.

See Miller, William A.

Waveguide discontinuities; Schwinger's lectures. Schwinger, Julian, Gordon and Breach Science Publishers 1969. See Marcuvitz, N.

Writing for technical and business magazines. Dodds, R. H., John Wiley & Sons 1969. See Michaelson, Herbert B.

Broadcasting; cf. TV broadcasting Burndy Library; history of science and technology; books and exhibits. Friedlander, Gordon D., SPEC 70 Mar 54-64

Cables; underground power transmission; high-voltage cable systems; state of the art. Avila, Charles F., SPEC 70 Mar 42-48
 Canada; communication technologies; evaluation of social effects by simulation. Punchard, J. C. Reginald, SPEC 70 Jan 51-54
 Ceramic filters; inductorless filters; characteristics. Moschytz, George S., SPEC 70 Jan 30-36.

SPEC 70 Aug 30-36
Ceramies; cf. Ferroelectric ceramics
Channels; cf. Space communication channels

Circuit breakers; arc medium considerations. Rieder, W., SPEC 70 Sep. 80 - 84

Circuit breakers; arc phenomena, arc media, and testing. Rieder, W., SPEC 70 Jul 35-43

Closed-circuit TV; Stanford University; off-campus graduate education. Pettit, Joseph M., SPEC 70 May 73-80

Coding; space communication channel applications. Forney, G. David Jr., SPEC 70 Jtm 47–58
Color video recording; process description; mechanical, optical, and electronic arrangements. Goldmark, Peter C., SPEC 70 Sep 22–33
Communication; quality of information transferred; responsibilities of the engineer; editorial. Herold, E. W., SPEC 70 Jtd 23.
Communication; cf. Acquisic underged communication; Riocommunication; cf. Acquisic underged communication; Riocommunication; cf. Acquisic underged communication; Riocommunication; cf. Acquisic underged communication; cf. Acquisic underged communication; cf. Acquisic underged communication; cf. Acquisic underged communication; cf. Acquisition and control of the communication of the communication of the communication of the control of the control of the communication of the control of the contr

Communication; cf. Acoustic undersea communication; Biocommuni-

Communication technologies; evaluation of social effects by simulation. Punchard, J. C. Reginald, SPEC 70 Jan 51-54
Company start-up; cf. Entrepreneurship
Computer applications; minicomputers. Jurgen, Ronald K., SPEC 70 Aug

Computer applications; cf. Speech synthesis Conferences; IEEE Conference Board organization and functions; editorial. Herold, Edward W., SPEC 70 Jun 25

Constant-current sources; theory of operation; measurement applications. Walker, Geoffrey F., SPEC 70 Sep 47–58
Contacts; cf. Circuit breakers
Control; cf. Automatic control

Correlators; cf. Digital correlators

Cost-effectiveness; cost reductions in terms of number of units produced; calculation. Conley, Patrick, SPEC 70 Jun 63-68

Crosstalk; high-speed logic circuit interconnections. DeFalco, John A., SPEC 70 Jul 44–50
Crystal filters; cf. Monolithic crystal filters
Current sources; cf. Constant-current sources
Current-mode logic; cf. Emitter-coupled logic

Dartmouth/Tuskegee program; results of program; future plans. Manasse, Fred K., SPEC 70 Dec 59-64

Data communication systems; man-machine conversational systems for on-line computers, Ohigashi, Hideo, SPEC 70 Mar 77-82

Data transmission systems; performance analysis; time-division multiplexing. Rudin, Harry, Jr., SPEC 70 Feb 79-85

De power supplies; desensitization to ac disturbances. Huang, K. T., SPEC 70 Jun 69-73

70 Jun 69-73

70 Jun 69-13
Decision making; engineering truth in adversary confrontations. Wilmotte, Raymond M., SPEC 70 May 45-49
Decision making; pricing and capacity expansion decisions using experience curves. Conley, Patrick, SPEC 70 Jun 63-68
Defense industries; conversion from military to commercial work; international trade. Ullmann, John E., SPEC 70 Apr 55-62
Delays; cf. Time delays

Delta modulation; principles and applications in telephone systems. Schindler, H. R., SPEC 70 Oct 69-78

Digital circuits; cf. Logic circuits
Digital computers; cf. Minicomputers
Digital correlators; LSI; design and fabrication. Hochman, Herschel T.,
SPEC 70 May 50-58
Digital filters; inductorless design. Moschytz, George S., SPEC 70 Sep

63-75
Digital integrated circuits; comparison of various types; resistor-transistor logic; diode-transistor logic; high-threshold logic; transistor-transistor logic; emitter-coupled logic; MOS devices. Garrett, Lane S., SPEC 70 Oct 46-58, Nor 63-72, Dec 30-42
Digital signal processing; speech synthesis by formant and text synthesis methods; voice answer-back computer readouts. Flanagan, James L., SPEC 70 Oct 22-45
Diode-transistor logic; digital integrated circuits; characteristics of logic families. Garrett, Lane S., SPEC 70 Oct 46-58
Distribution networks; cf. Urban power distribution networks

Echo suppression; telephony using satellite relay stations. Gould, Richard G., SPEC 70 Apr 47-54
Economics; microeconomics; cost and price behavior of products. Conley, Patrick, SPEC 70 Jun 63-68
Education; Dartmouth/Tuskegee program; results of program and future plans. Manusse, Fred K., SPEC 70 Dec 59-64

Education; Dartnew, SPEC 70 Dec 59-64

Education; laboratory equipment needs; help from industry. Van Valkenburg, M. E., SPEC 70 Apr 23

Education; cf. Graduate education; Undergraduate education

Educational TV; Stanford University; off-campus graduate education. Pettit, Joseph M., SPEC 70 May 73-80

EIIV transmission lines; Federal Republic of Germany; towers, lines, and insulators. Jansen, J., SPEC 70 Apr 33-40

Electric shock hazards; climination by ground-fault interrupters. Dalziel, Charles Francis, SPEC 70 Jan 55-62

Electric utilities; pollution problem; abatement and control programs. Friedlander, Gordon D., SPEC 70 Nov 40-50, Dec 65-75

Electrical engineering employment; the problem and IEEE's course of action. Granger, John V. N., SPEC 70 Nov 32-33

Electrical engineers; participation in public policy formation; editorial. Barnes, Frank S., SPEC 70 May 21

Electrical engineers; professional development; IEEE ad hoc Committee on Professional Concerns of Young Engineers; editorial. Hodges, Dacid A., SPEC 70 Jan 55-62

Electrical fires; elimination by ground-fault interrupters. Dalziel, Charles Francis, SPEC 70 Jan 55-62

Electrical science; philatelic history. Soanes, S. V., SPEC 70 Jan 80-85

Electronic sindustry; inductorless filters; survey of monolithic crystal filters, ceramic filters, and mechanical filters. Moschytz, George S., SPEC 70 Aug 30-36

Electronic video recording; cf. Color video recording

Electronic sindustry; conversion from military to commercial work; international trade. Ullmann, John E., SPEC 70 Apr 75-62

Electronics industry; employment problem; IEEE's course of action. Granger, John V. N., SPEC 70 Noc 32-33

Electronics industry; employment problem; IEEE's course of action. Granger, John V. N., SPEC 70 Noc 32-33

Electronics industry; employment problem; IEEE's course of action. Granger, John V. N., SPEC 70 Noc 32-33

Electronics industry; history; commercial beginnings. Susskind, Charles, SPEC 70 Apr 78-83

Electrooptic effects; ferroelectric ceramics; device possibilities.

Electrooptic effects; ferroelectric ceramics; device possibilities. Land, Cecil A., SPEC 70 Feb 71–78
Emitter-coupled logic; characteristics, operation. Garrett, Lane S., SPEC 70 Dec 30–42

To Dec 30-42

Employment; job seeking; advice on leads, resumes, and interviews. Pell, Arthur R., SPEC 70 Sep 34-36

Employment; pensions; vested rights when employment is involuntarily terminated. Fink, Donald G., SPEC 70 Nov 34-39.

Employment; cf. Electrical engineering employment

Energy consumption; population growth and life-support capabilities; system analysis. Austin, Arthur L., SPEC 70 Dec 43-54

Energy-reservoir circuits; desensitization of dc power supplies. Huang, K. T., SPEC 70 Jun 69-73

Energy sources; type, origin, and consumption since 1925; international flow. Darmstadter, Joel, SPEC 70 May 67-72

Engineering; history; Burndy Library. Friedlander, Gordon D., SPEC 70 Mar 54-64

Engineering; opportunities for minority group members; editorial.

Engineering; opportunities for minority group members; editorial. Willenbrock, F. Karl, SPEC 70 Aug 29
Engineering; social consequences of technology; IEEE President's address at 1970 convention banquet. Granger, J. V. N., SPEC 70 May 22–23
Engineering; social effects of engineering action; editorial. McCue, J. J. G., SPEC 70 Mar 31

SPEC 70 Mar 31
Engineering employment; cf. Electrical engineering employment
Engineers; cf. Electrical engineers
Entrepreneurship; financial assistance from established companies. Jordan,
John F., SPEC 70 Feb 40-41
Esclangon diagram; method for showing current and voltage variation
along transmission lines. Poloujadoff, Michel, SPEC 70 Feb 92-94
Estination; least-squares estimation from Gauss to Kalman; historical
survey. Sorenson, Harold W., SPEC 70 Jul 63-68
EVR; cf. Color video recording
Extra high voltage; cf. EHV

FAA; see Federal Aviation Administration

Fast Fourier transforms; application to speech spectrogram implementa-tion. Oppenheim, Alan V., SPEC 70 Aug 57-62

Federal Aviation Administration; air-traffic control ground systems; plans for present decade. Friedlander, Gordon D., SPEC 70 Jul 69-83

Ferroelectric ceramics; electrooptic effects; device possibilities. Land, Cecil A., SPEC 70 Feb 71-78

Ferroelectric ceramics; piezoelectric effects; macroscopic theory. Holland, Richard, SPEC 70 Apr 67-77

Filtering theory; cf. Kalman filtering

Fire protection; electrical fires; elimination by ground-fault interrupters. Dalziel, Charles Francis, SPEC 70 Jan 55-62.

Forecasting; cost, price and capacity requirement forecasting using experience curves. Conley, Patrick, SPEC 70 Jun 63-68

Forecasting; cf. Technological forecasting

Forecasting; cf. Technological forecasting Foreign trade; cf. International trade

ourier transforms; cf. Fast Fourier transforms

Fuel; cf. Energy sources

### G

Gasdynamic lasers; lasing action induced by supersonic flow. *Gerry*, *Edward T.*, *SPEC 70 Nov* 51–58
Germany, Federal Republic; EHV transmission lines; towers, lines, and insulators. *Jansen*, *J.*, *SPEC 70 Apr* 33–40
Government science policies; research funding in the 1970s. *Heffner*, *Hubert*, *SPEC 70 Jul* 31–34
Conductor educations of the control of the control of the second of t

Graduate education; educational TV; off-campus graduate education at Stanford University. Pettit, Joseph M., SPEC 70 May 73-80 Graduate education; government science policies; research grants in the 1970s. Heffner, Hubert, SPEC 70 Jul 31-34

Ground transportation; coordinated area planning. Gibson, John E., SPEC 70 Oct 79-86
Ground-fault interrupters; elimination of electric shock hazards and electrical fires. Dalziel, Charles Francis, SPEC 70 Jan 55-62

Hall-effect devices; measurements using constant-current sources. Walker, Geoffrey F., SPEC 70 Sep 47-58
High-threshold logic; digital integrated circuits; characteristics of logic families. Garrett, Lane S., SPEC 70 Oct 46-58
History; electronics industry; commercial beginnings. Susskind, Charles, SPEC 70 Apr 78-83
History; electrons; discovery and early experiments. Susskind, Charles, SPEC 70 Sep 76-79
History; least-squares estimation from Gauss to Kalman. Sorenson, Harold W., SPEC 70 Jul 63-68
History; philatelic history of electrical science. Soanes, Sidney Vincent, SPEC 70 Jan 80-85
History; science and technology; Burndy Library. Friedlander, Gordon D.,

History; science and technology; Burndy Library. Friedlander, Gordon D., SPEC 70 Mar 54-64
History; TV; ideas proposed from 1877 to 1884. Shiers, George, SPEC 70 May 24-34

Human factors; aircraft pilots; air-traffic control. Friedlander, Gordon D., SPEC 70 Aug 76-89

IEEE; electrical engineering employment problem; IEEE's course of action. Granger, John V. N., SPEC 70 Nov 32-33
IEEE; 1969 secretary's, treasurer's, and auditors' report. Granger, J. V. N. (President), SPEC 70 Jun 74-86
IEEE; nonnational character; editorial. McCue, J. J. G., SPEC 70 Jun 31
IEEE; President's address at 1970 convention banquet; social consequences of technology. Granger, J. V. N., SPEC 70 May 22-23
IEEE; role in encouraging minority group members to enter engineering; editorial. Willenbrock, F. Karl, SPEC 70 Aug 29
IEEE ad hoc Committee on Professional Concerns of Young Engineers; request for participation by interested persons; editorial. Hodges, David A., SPEC 70 Oct 21
IEEE Conference Board; organization and functions; editorial. Herold, Edward W., SPEC 70 Jun 25
IEEE International Convention; continuing education function; editorial. McCue, J. J. G., SPEC 70 Feb 39
IEEE Spectrum; publication policies and procedures; editorial. DeWitt, David, SPEC 70 Sep 21
IEEE standards; generation and publication activities, editorial. Barrow, Bruce B., SPEC 70 Dec 24
Inductorless filters; active and digital filters; survey. Moschytz, George S., SPEC 70 Sep 63-75
Inductorless filters; electromechanical filters; survey. Moschytz, George S., SPEC 70 Aug 30-36

Inductorless filters; active and digital filters; survey. Moschytz, George S., SPEC 70 Sep 63-75
Inductorless filters; electromechanical filters; survey. Moschytz, George S., SPEC 70 Aug 30-36
Industrial relations; movement patterns of professional technical personnel. Howell, Richard P., SPEC 70 Jan 32-41
Industrialization; cf. Technological change
Information dissemination; quality of information transferred; responsibilities of the engineer; editorial. Herold, Edward W., SPEC 70 Jul 23
Infrared communication; moths. Hsiao, Henry S., SPEC 70 Mar 69-76
Injection lasers; properties; use in optical communication systems. Konnerth, Karl L., SPEC 70 Sep 37-46
Instructional TV; cf. Educational TV
Integrated-circuit interconnections; chip interconnection techniques for hybrid integrated circuits. Suran, Jerome J., SPEC 70 Jan 67-79
Integrated-circuit interconnections. DeFalco, John A., SPEC 70 Jul 44-50
Integrated circuits; operational amplifiers in linear active networks; analysis. Moschytz, George S., SPEC 70 Jan 42-50
Integrated circuits; Schottky barrier applications. Yu, Albert Y. C., SPEC 70 Mar 83-89
Integrated circuits; system design considerations. Suran, Jerome J., SPEC

Integrated circuits; system design considerations. Suran, Jerome J., SPEC 70 Jan 67-79

Integrated circuits; technologies; applications. Johnson, Harwick, SPEC 70 Feb 56-66

Integrated circuits; cf. Digital integrated circuits; LSI; Monolithic

integrated circuits
Interactive systems; man-machine conversational data communication systems for on-line computers. Ohigashi, Hideo, SPEC 70 Mar 77-82

Interconnection noise; crosstalk and reflection in high-speed logic circuit interconnections. DeFalco, John A., SPEC 70 July 44-50
 International trade; electronics industry; conversion from military to commercial work. Ullmann, John E., SPEC 70 Apr 55-62
 International trade; energy sources; type, origin, and consumption since 1925. Darmstadter, Joel, SPEC 70 May 67-72

Job seeking; advice on leads, resumes, and interviews. Pell, Arthur R., SPEC 70 Sep 34-36

Kalman filtering; historical survey relating Kalman filtering to Gauss' least-squares estimation. Sorenson, Harold W., SPEC 70 Jul 63-68

Laboratories; equipment needs in universities; help from industry. Van Valkenburg, M. E., SPEC 70 Apr 23
Large-scale integration; cf. LSI
Lasers; cf. Gasdynamic lasers; Injection lasers
Legislation; engineering truth in adversary confrontations. Wilmotte, Raymond M., SPEC 70 May 45-49
Libraries; Burndy Library for history of science and technology; books and exhibits. Friedlander, Gordon D., SPEC 70 Mar 54-64
Light-emitting diodes; properties; use in optical communication systems. Konnerth, Karl L., SPEC 70 Sep 37-46
Logic; cf. Emitter-coupled logic; High-threshold logic; Transistor-transistor logic; MOS logic devices
Logic circuits; interconnections; reflection and crosstalk in high-speed

transition logic, MOS logic devices
Logic circuits; interconnections; reflection and crosstalk in high-speed circuit interconnections. *DeFalco, John A., SPEC 70 Jul* 44–50
LSI; design and fabrication; digital correlators. *Hochman, Herschel T., SPEC 70 May* 50–58
LSI; system design using silicon integrated circuits. *Suran, Jerome J., SPEC 70 Jan* 67–79

Magnetohydrodynamics; cf. MHD Management; cf. R&D management

Management communication; engineering truth in adversary confrontations. Wilmotte, Raymond M., SPEC 70 May 45-49
 Man-machine systems; conversational data communication systems for on-line computers. Ohigashi, Hideo, SPEC 70 Mar 77-82
 Measurements; cf. Semiconductor device measurements
 Meaboried Elevation of the state of the stat

Measurements; cf. Semiconductor device measurements
Mechanical filters; inductorless filters; characteristics. Moschytz, George
S., SPEC 70 Aug 30-36
MHD converters; liquid metal MHD topping cycles in combination with
steam plants. Prem, Lawrence L., SPEC 70 May 35-44
Microelectronics; VHF amplifier using discrete technology. Cho, Susumu,
SPEC 70 Mar 49-53
Microelectronics; cf. Integrated circuits
Microstrip lines; interconnection of high-speed logic circuits; reflection
and crosstalk. DeFalco, John A., SPEC 70 Jul 44-50
Microwave communication; moths. Hsiao, Henry S., SPEC 70 Mar 69-76
Minicomputers; basic system configurations; applications. Jurgen, Ronald
K., SPEC 70 Aug 37-52
Missile defense; cf. Safeguard Ballistic-Missile Defense system
Monolithic crystal filters; inductorless filters; characteristics. Moschytz,
George S., SPEC 70 Aug 30-36
Monolithic integrated circuits; voltage regulators. Kesner, Don, SPEC 70

Monolithic integrated circuits; voltage regulators. Kesner, Don, SPEC 70
Apr 24-32
MOS logic devices; characteristics, operation, Garrett, Lane S., SPEC 70

Dec 30-42 Moths; infrared and microwave communication. Hsiao, Henry S., SPEC

70 Mar 69-76
Motors; cf. Stepper motors
Multiplexing; cf. Time-division multiplexing

Noise; amplifiers; inherent problems and signal-to-noise ratio improvement. Letzter, Seymour, SPEC 70 Aug 67-75
Noise; cf. Interconnection noise
Nuclear power stations; fast breeder reactors; economic considerations.
Benedict, Manson, SPEC 70 Jul 24-30

Ohmic contacts; unified characterization of Schottky barriers and ohmic contacts. Yu, Albert Y. C., SPEC 70 Mar 83-89
On-line computers; man-machine conversational data communication systems. Ohigashi, Hideo, SPEC 70 Mar 77-82
Operational amplifiers; integrated nonideal amplifiers in linear networks; analysis. Moschytz, George S., SPEC 70 Jan 42-50
Optical communication systems; injection lasers and light-emitting diodes. Konnerth, Karl L., SPEC 70 Sep 37-46
Orthogonal functions; cf. Walsh functions

IEEE spectrum DECEMBER 1970

PCM; delta modulation; principles and applications in telephone systems. Schindler, II. R., SPEC 70 Oct 69-78

Pensions; vested rights when employment is involuntarily terminated. Fink, Donald G., SPEC 70 Nov 34-39

Personnel; cf. Job seeking; R & D personnel
Piezoelectric devices; monolithic crystal filters and ceramic filters; characteristics. Moschytz, George S., SPEC 70 Aug 30-36

Piezoelectric effects; ferroelectric ceramics; macroscopic theory. Holland, Richard, SPEC 70 Apr 67-77

Planning: experience curve applications. Conley, Patrick, SPEC 70 Jun

Planning; experience curve applications. Conley, Patrick, SPEC 70 Jun 63-68

Do-too
 Pollution control; electric utilities; abatement and control programs. Friedlander, Gordon D., SPEC 70 Nov 40-50, Dec 65-75
 Population growth; energy consumption and life-support capabilities; system analysis. Austin, Arthur L., SPEC 70 Dec 43-54
 Position control; cf. Stepper motors

Postage stamps; history of electrical science. Soanes, Sidney Vincent, SPEC 70 Jan 80-85

Postage stamps; history of electrical science. Soanes, Sidney Vincent, SPEC 70 Jan 80-85
Power generation; pollution problem; abatement and control programs. Friedlander, Gordon D., SPEC 70 Nov 40-50, Dec 65-75
Power networks; urban power distribution networks; long-term system planning. Meinert, Jens, SPEC 70 Jan 41-46
Power stations; MHD topping cycles in combination with steam plants. Prem, Lawrence L., SPEC 70 May 35-44
Power stations; cf. Nuclear power stations
Power supplies; desensitization to ac disturbances. Huang, K. T., SPEC 70 Jan 69-73
Power supply circuits; aircraft electric systems; solid-state switching, Dickey, Lee D., SPEC 70 Nov 73-79
Power transmission; cf. Underground power transmission
President's address; 1970 IEEE Convention banquet; social consequences of technology. Granger, J. V. N., SPIC 70 May 22-23
Professional development; IEEE ad hec Committee on Professional Concerns of Young Engineers; request for participation by interested persons; editorial. Hodges, David A., SPEC 70 Oct 21
Proprietary rights; employee-employer agreements; effect on innovation. Rines, Rohert II., SPIC 70 Apr 41-46
Psychological considerations; technological change; subjective behaviorial effects of new technology; editorial. Herold, E. W., SPEC 70 Nov 31
Public affairs; engineering truth in adversary confrontations. Wilmotte, Raymond M., SPEC 70 May 45-49
Public affairs; public policy formation; participation of electrical engineers; editorial. Barnes, Frank S., SPEC 70 May 21
Pulsars; characteristics; signal origin. Tilson, Seymour, SPEC 70 Feb 42-55

Pulsars; characteristics; signal origin. Tilson, Seymour, SPEC 70 Feb 42-55

Queuing theory; application to data transmission; time-division multiplexing. Rudin, Harry, Jr., SPEC 70 Feb 79–85

Radar systems; Safeguard Ballistic-Missile Defense system. Johnson, Charles, M., SPEC 70 Mar 32–41 Radioastronomy; cf. Pulsars

Readouts; voice answer-back computer readouts; speech synthesis by formant and text synthesis methods. Flanagan, James L., SPEC 70

R&D; government science policies; research funding in the 1970s. Heff-ner, Hubert, SPEC 70 Jul 31–34

R&D management; Movement patterns of professional technical personnel. Howell, Richard P., SPEC 70 Jan 32-41
 Resistor-transistor logic; digital integrated circuits; characteristics of logic families. Garrett, Lane S., SPEC 70 Oct 46-58
 RF amplifiers; cf. VIIF amplifiers

Safeguard Ballistic-Missile Defense system: radar systems. Johnson, Charles, M., SPEC 70 Mar 32-41
 Satellite communication systems; TV broadcasting; nontechnical considerations. Haviland. Robert P., SPEC 70 Feb 86-91
 Satellite relay systems; transmission delay and echo suppression for telephony. Gould, Richard G., SPEC 70 Apr 47-54
 Schottky barriers; unified characterization of ohmic contacts and Schottky barriers; applications. Yu, Albert Y. C., SPEC 70 Mar 83-89
 Schottky diodes; use in transistor-transistor logic. Garrett, Lane S., SPEC 70 Nov 63-72
 Science; history; Burndy Library. Friedlander, Gordon D., SPEC 70 Mar 54-64

Science policies; cf. Government science policies
Semiconductor device measurements; use of constant-current sources.

Walker, Geoffrey F., SPEC 70 Sep 47–58

Sensitivity analysis; active filters; stability. Geffe, Philip R., SPEC 70 May

63-66
Sensitivity minimization; integrated operational amplifiers in linear active networks; analysis. *Moschytz, George S., SPEC 70 Jan* 42-50
Sequency theory; Walsh functions. *Harmuth, Henning F., SPEC 69 Not* 82-91

Simulation; communication technology evaluation. Punchard, J. C. Reginald, SPEC 70 Jan 51-54
 Social problems; engineers' role in public affairs. Ponte, Maurice, SPEC 70 Jul 51-58

Social problems; IEEE ad hoc Committee on Professional Concerns of Young Engineers; request for participation by interested persons; editorial. Hodges, David A., SPEC 70 Oct 21

Social problems; public policy formation; participation of electrical engineers; editorial. Barnes, Frank S., SPEC 70 May 21
Social problems; responsibilities of the engineer; editorial. Herold, E. W.,

SPEC 70 Jul 23
Social problems; role of engineers; editorial. McCue, J. J. G., SPEC 70

Social problems; social consequences of technology; IEEE President's address at 1970 convention banquet. Granger, J. V. N., SPEC 70 May

Social problems; technological change; social consequences. Eddy, Neal, SPEC 70 Aug 53-56
Social problems; cf. Population growth
Space communication channels; coding. Forney, G. David Jr., SPEC 70

Space communication channels; coding. Forney, G. David Jr., SPEC 70 Jun 47-58
Spectrum; cf. IEEE Spectrum
Speech analysis; spectrogram implementation using fast Fourier transforms. Oppenheim, Alan V., SPEC 70 Aug 57-62
Speech synthesis; formant and text synthesis methods for voice answerback computer readouts. Flanagan, James L., SPEC 70 Oct 22-45
Stability; active filters; low-sensitivity circuits. Geffe, Philip R., SPEC 70 May 63-66
Standards: cf. IEEE standards

Standards; cf. IEEE standards
Stanford University; educational TV for off-campus graduate education.

Pettit, Joseph M., SPEC 70 May 73-80

Stepper motors; characteristics, operation, and applications. *Bianculli*, *Anthony J.*, *SPEC 70 Dec* 25–29

Switches; aircraft electric systems; solid-state switching. Dickey, Lee D., SPEC 70 Nov 73-79.

Switchgear; cf. Circuit breakers

Technical presentations; engineering truth in adversary confrontations. Wilmotte, Raymond M., SPEC 70 May 45-49
Technical societies; cf. IEEE
Technical change; population growth, energy consumption, and life-support capabilities; system analysis. Austin, Arthur L., SPEC 70 Dec 43-54

Technological change; psychological considerations; subjective behaviorial effects of new technology; editorial. Herold, E. W., SPEC

Technological change; social consequences. Eddy, Neal, SPEC 70 Aug

Technological forecasting; communication technologies; evaluation of social effects by simulation. *Punchard, J. C. Reginald, SPEC 70 Jan* 51–54

Technology; history; Burndy Library. Friedlander, Gordon D., SPEC 70 Mar 54-64

Mar 54-64
Technology transfer; defense electronics industry; conversion from military to commercial work. Ullmann, John E., SPEC 70 Apr 55-62
Telephone systems; delta modulation; principles and applications. Schindler, II. R., SPEC 70 Oct 69-78
Telephone systems; satellite relay stations; transmission delay and echo suppression. Gould, Richard G., SPEC 70 Apr 47-54
Time delays; telephony using satellite relay stations. Gould, Richard G., SPEC 70 Apr 47-54
Time delays; telephony using satellite relay stations. Gould, Richard G., SPEC 70 Apr 47-54

Time-division multiplexing, asynchronous; data transmission. Rudin, Harry, Jr., SPEC 70 Feb 79-85

Trade; cf. International trade

Transistor-transistor logic; use in medium and high-speed circuits; Schottky transistor-transistor logic. Garrett, Lane S., SPEC 70 Nov 42 72 63-72

63-72
Transmission lines; Esclangon diagram; method for showing current and voltage variation along line. *Poloujadoff, Michel, SPEC 70 Feb* 92-94
Transmission lines; cf. EHV transmission lines; Microstrip lines
Transportation; cf. Air-traffic control
Transportation planning; coordinated area planning for ground transportation. *Gibson, John E., SPEC 70 Oct 79*-86
Tuskegee/Dartmouth program; results of program; future plans. *Manasse, Fred K., SPEC 70 Dec 59*-64
TV; history; ideas proposed from 1877 to 1884. *Shiers, George, SPEC 70 May* 24-34
TV: cf. Educational TV

TV; cf. Educational TV

Productions: 14 Production Fig. 20 Production Fig. 19 Productin Fig. 19 Production Fig. 19 Production Fig. 19 Production Fig. 1

Undergraduate education; Dartmouth/Tuskegee program; results of program and future plans. *Manasse*, *Fred K.*, *SPEC 70 Dec* 59-64 Underground power transmission; high-voltage cable systems; state of the art. *Avila*, *Charles F.*, *SPEC 70 Mar* 42-48 Undersea acoustic communication; effects of absorption and multipath distortion on bandwidth. *Anderson*, *Victor C.*, *SPEC 70 Oct* 63-68

Unemployment; cf. Job seeking
Urban power distribution networks; power supply for large cities; long-term system planning. Meinert, Jens, SPEC 70 Jun 41-46
Utilities; cf. Electric utilities

Very high frequency; cf. VHF VHF amplifiers; miniaturized low-power-drain amplifier using discrete technology. Cho, Susumu, SPEC 70 Mar 49-53 Video recording; cf. Color video recording Voltage regulators; monolithic integrated circuits. Kesner, Don, SPEC 70 Apr 24-32

### w

Walsh functions; sequency theory. Harmuth, H., SPEC 69 Nov 82-91

### **News Index**

ivews index
Abstracts wanted for Proceedings issue, July
(ACM) Application of computers to the prob-
lems of urban society Nov IX
Ad Hoc Committee on Electrography, Insti- tute announces formation of Feb 120
tute announces formation of Feb 120 Advance tables of contents notice
Advance tables of contents to be reinstated
Aerospace Antennas Conference, June 8-10, 1971, London, England. Dec 92 Aerospace Power Conditioning Specialists
1971, London, EnglandDec 92
Conference to be held in Maryland, Apr
Conference to be held in Maryland, Apr 20-21, 1970
ner
Air Force weathermen will study solar eclipse
Air pollution, Remote-control laser could control. Oct 16 Allerton Conference is accepting contributions
control Oct 16
Jul 108
American Power Conference, April 21–23 1970, Chicago, Ill., will consider power systems and environment
systems and environmentMar 20
offer 82 papersAug 119
Apollo 12: Reassessing electronic hardware in the light of near failures. Jan 22
Appliance Technical Conference, Chicago, Ill.,
May 4-5, 1971: Paper call issued Aug 120 Appliance Technical Conference, Mansfield, Ohio, May 5-6, 1970: Expects over 350
Ohio, May 5–6, 1970: Expects over 350 engineers
Application of computers to the problems of
Ohio, May 5-6, 19/0: Expects over 350 engineers
MentsJun 20 ASEE adopts resolution regarding campus
disruptions
of conferenceAug 120
Astin, A. V., named recipient of IEEE Field Award for 1970Jan 117
Award for 1970 Jan 117 AT &T, Domestic satellite system planned by
Australia ICMCST 1970 to be hold in
(Australia) Paper call issued Aug 19
Automatic Support Systems for Advanced
Aug 119 (Australia) Paper call issued Aug 19 Automatic Support Systems for Advanced Maintainability Symposium, Oct 19-21, 1970, St. Louis, Mo. Oct 131 Awards (includes Citations, Fellowships,
Awards (includes Citations, Fellowships, Medals, Scholarships, and Prizes)
Harry Diamond Award to A. H. Guenther
Edison Medal Award announcement. Dec 92
Edison Medal to H. H. Aiken Feb 118 Fortescue Fellowship to go to A. L. Gilbert
Apr 116 Fortescue Fellowships available for 1971
1972Sep 107
Founders Award to M. D. Hooven . Feg 118 Correction Apr 119
William M. Habirshaw Award to F. J. Vogel
Nov 04
Hickernell Award presented to Ralph E. LaChance. Apr 119
(IEEE Computer Group) McDowell Award to F. P. Brooks, JrAug 116 IEEE Education Medal to Jacob Millman
IEEE Education Medal to Jacob Millman
IEEE Field Awards, H. C. A. van Duuren and A. V. Astin named as recipients of two
IEEE Medal of Honor, Dennis Gabor wins
TEEE Medal of Honor, Dennis Gabor wins
Correction
hoven is named first recipient of new
IEEE Prize Paper Awards:
IEEE Prize Paper Awards: W. R. G. Baker Prize Award to George J.
W. R. G. Baker Frize Award to George J. Friedman and Cornelius T. Leondes Feb 118 Browder J. Thompson Memorial Prize Award to John David Rhodes. Feb 118 Student Prize Paper Award to David I.
Browder J. Thompson Memorial Prize Award to John David Rhodes Feb 118
Student Prize Paper Award to David I.  Durst, Michael Lefkowitz, James E.  SmithFeb 118
SmithFeb 118
International Communication Award to Henri Busignies
International Communication Award to Herre RiniaNov 94
Herre RiniaNov 94  Mervin J. Kelly Award to D. A. McLean
Nov 95

Lamme Medal to Harry F. OlsonFeb 118 Morris E. Leeds Award to Martin E. Pack-
ard
Morris N. Liebmann Award to be given to
Martin Ryle
Morris N. Liebmann Memorial Prize Award
to John A. Copeland at 1970 ISSCC
David Sarnoff Award to A. L. McWhorter
Nov 96
Vladimir K, Zworykin Award to A, C, SchroederNov 96
Awards and Prizes, Summary of IEEE

### В

Baltimore Chapter of G-ED wants contro-
versial subjects
Battery advances advent of electric auto, New
Correction
Belgium, Instrumentation congress to be in
(Bell Labs) Recent laser developments include
semiconductor and 'exciplex' devices
(Bell Labs & Aarhus University) Neptunium
lifetime is measured directlySep 17
Berkner, Lloyd V., AGU Memorial Fund
honorsApr 115
Bioengineering symposium scheduled in May,
Annual
Booklet discusses careers in computing. Jul 18
Brooks, Frederick P., Jr. named recipient of
McDowell Award
Buenos Aires, UPADI convention to take place in
Busignies, Henri, honored with IEEE award
Aug 118

### C

С
Canada solicits manuscripts, ICC'71 in
Canada solicits manuscripts, ICC'71 in Dec 92 Canadian conference needs abstracts. Aug 121 Canadian Symposium on Communications, Nov. 12–13, 1970, Montreal: Papers solicited
Program finalized Oct 111 Candidates for Committee activities, IEEE secks Feb 124 Cassette Colloquia of IEEE presents two new
Cassette Colloquia of IEEE presents two new topics
topics
Cassette-tape service, IEEE to expand. Jul 110 (CECON) Cleveland Electronics Conference April 7-9, 1970: To present first Medal of Achievement
ulaliabolis, iliu., way 11-14, 1970 in siliny
cement industry Apr 116 Central American Section celebrates its inauguration Nov 100
(Chromobeam) New process enables conver- sion of video-taped material to color film
Circuit Theory Symposium (International), December 14-16, 1970, Atlanta, Ga.: Session titles
Circuit Theory Transactions special issue needs papers
papers
on, April 20-21, 1970, Houston, Tex.: Requests contributions
Colloquium held in N.Y.U. engineering series, First
Computer and System Science Conference,
Computer and System Science Conference, April 26–27, 1971, Houston, Tex.: Invites papers
Computer Group sponsors symposium
Computer internships set up in developing areas
Computer system may read home meters via telephone

Computers and Communications Conference,
Rome, N.Y., September 22-24, 1970: Mohawk Valley Section meeting in need
of papers
Computers to the problems of urban society,
Monawk Valley Section meeting in need of papers
Call for papers
Conference on Electric Process Heating,
call issued Apr 115
Milwaukee, Wis., April 20-21, 19/1: Paper call issued
Seeks contributionsApr 112
Conference on Laser Engineering and Appli-
D.CSep 109
D.C
Measurements, June 2–5, 1970, Boulder,
Colo
New Generation in Industrial Control,
Cleveland, Ohio, June 15–16, 1970
Conference on Vehicular Technology, Washington, D.C., Dec. 2-4, 1970: In need of papers. Apr 119 Convention and Exhibition, 1970 IEEE Inter-
ington, D.C., Dec. 2-4, 1970: In need of
Convention and Exhibition, 1970 IEEE Inter-
national:
Theme of Convention Jan 119 Technical program Feb 21
Opens March 23 Mar 120
Exhibitors Mar 135
Conference technical sessions draw well this
Opens March 23 Mar 120 Exhibitors Mar 135 Conference technical sessions draw well this year Jun 110 Convention and Exhibition, 1971 IEEE Inter-
national: William J. Hilty to be IEEE Convention
DirectorJan 118
DirectorJan 118 British companies will exhibitNov 101
Will offer more sessions. Dec 91 Copeland, John A. receives IEEE Morris N.
Liebmann Memorial Prize Award
Course for practicing engineers, Student offer
Course for practicing engineers, Student offer
Course listings, New Approach to short Jun 114, Oct 111 Course on optical communication, M.I.T. to
Course on optical communication, M.I.T. to
give
ShortFeb 15
Courses, Additional shortApr 17

### D

Denmark to host school on information sys-
tems
DeWitt named IEEE Spectrum editorSep 6
Dicke Panel scores effects on fund freeze on
U.S. radio astronomyJan 20
Display Devices, Conference on (December
2-3, 1970):
In need of papersJun 114
Lists program
Draft-law revisions are important to recent
graduatesAug 19
Drafted engineers urged, Better utilization of
Dec 19
Durst, David I, and Michael Lefkowitz win
Student Prize Paper AwardFeb 118

### Ε

_
EASCON, Oct. 26-28, 1970, Washington, D.C.:
Call for papersMar 121
ProgramOct 110 Ecological issues receive mounting national
attentionAug 20 Ecology and the computer, Short course will
relateFeb 15
Education conference to convene this month
(Education) Frontiers in Education Conference, April 13–15, 1971, Atlanta, Ga.:
Paper call
ing, IEEE
(EEI-NEMA) Standards issued for luminaire attachments
EEMTIC invites papers, 1971Sep 110 EIA, New standards are issued by Dec 19
(EIA-NEMA) Standards group for solid-state products formedOct 17
(EJC) Salaries are higher for engineering tech-
niciansMay 16

Electric and Electronic Measurement and Test Instrument Conference, June 1-3, 1971	Frequency Control Symposium, April 26–28, 1971, Atlantic City, N.J.: Papers needed	Information Sciences and Systems Conference, March 25–26, 1971, Princeton, N.J.:
Electric car enthusiasts are invited to compete in a race across the United States. Feb 14	Friedman, George J., and Cornelius T. Leondes win W. R. G. Baker Prize Award	Papers are needed Nov 22 Information services, IEEE receives grant for
Electric power supply, Summer's heat and Dec 18 Electrical Insulation Conference, Sept 20-23,	Funding for science, Austerity comes to	(Instrumentation, Medical) Medical group needs papers for annual meeting. Aug 20
1971, Chicago, Ill.; Paper call Oct 110  Electromagnetic Compatibility, International	Jul 14	Insurance benefits increased for IEEE members
Symposium on (July 14-16, 1970, Anaheim, Calif.)	G	guishesFeb 17 Integrated circuit is simple, easy to build, New
July 13–15, 1971, Philadelphia, Pa.: Seeks papersNov 103	Gabor, Dennis, wins IEEE Medal of Honor           Feb 118           Correction         Apr 119	Intelsat system, President reviews progress of May 16
(Electron Devices) Information display to receive special attention Aug 113 Electron, Ion, and Laser Beam Technology	issue wants sensor research papers	(International Conference on Communica- tions) 1970 ICC, San Francisco, Calif.,
Symposium, May 12–14, 1971, Boulder, Colo.: Calls for papers Dec 92	Gilbert, A. L., will receive Fortescue Fellow- ship	June 8-10, will feature two special sessions
Electronic Components Conference, May 10- 12, 1971, Washington, D.C Sep 113 Electronic device reads maps and charts	Granger, John V. N., elected 1970 IEEE PresidentJan 112	June 14-16, 1971, Montreal, Canada: Solicits papers
Electronic memory device may speed up calls	Grants are awarded to educate 'new' engineerJul 19 Ground-based research aids in the study of	Applications to Process Control (IFAC/- IFIP), Otaniemi, Finland, June 2–5, 1971
Electronic 'roll call' to locate vehicles, New type of automatic monitoring system uses	space	scheduled
Electronics will speed auto race data. Oct 17 Electrons control body temperature during	Guenther, Arthur H., to receive Harry Diamond Award Nov 94	ocean environment meeting will present more than 80 papersJul 107
surgeryJun 20 EMC draft guide will assist engineersApr 18	н	(International Conference on Microelectronics, Circuits, and System Theory) ICMCST 1970 to be held in Australia, Aug 18–21
(EMC) Draft-law revisions are important to recent graduates	Healy, D. W., Memorial fund to honor	International Congress on Intrumentation in Aerospace Simulation Facilities, June
graduates	High-pressure process makes wire by squeezing Aug 21	21–23, 1971, to be in Belgium Dec 91 International Electron Devices Meeting, Oct.
dataOct 16 ENERGY 70 announces programAug 117 Engineering Foundation plans research con-	Hilty, W. J., IEEE Convention Director Jan 118 Holm Seminar on Electric Contact Phenomena, November 9–12, 1970, Chicago	28-30, 1970, Washington, D.C.: Paper call
ferences	Holography made safe for use in retinal re-	International Geoscience Electronics Symposium, Washington, D.C., April 14-17
19, 1970: Call for papers Feb 122	search	International IEEE Conference on Systems, Networks, and Computers, January 19–21,
Session titles	Correction	1971, Mexico is first in seriesAug 120 International microwave meeting set for Stock-
Engineering Index, Inc., receives grant	Aug 18	International Microwave Symposium, May 16–21, 1971, Washington, D.CSep 109
(Engineering Societies Library) New reference collection published Aug 120 Engineering students and disadvantaged groups	IC structures, lasers, and light guides, New	(International Seminar on Digital Processing of Analog Signals) Zurich digital processing seminar attracts international participa-
(ECCP)	developments in miniaturization involve	tionJul 15 International Solid-State Circuits Conference,
Enrollments are down in engineering schools	ICs, Two developments may spark smaller, faster	Feb. 18-20, 1970, Philadelphia, Pa.: To feature discussion sessions, 66 technical papersJan 117
Environment: top-priority issue for the 70s, our decaying	IECI Group to offer infrared techniques	J. A. Copeland receives Field Award May 106 International Solid-State Circuits Conference,
Eta Kappa Nu announces new officers and directorsJul 111	IEEE awards—opportunity now open for nominations	Feb. 17–19, 1971, Philadelphia Sep 110 International Symposium on Circuit Theory
(Eta Kappa Nu) Nominations due for young engineer award	IEEE Conference Board committees meet, Two	Dec. 14–16, 1970, Atlanta, Ga.: Georgia symposium to study circuit theory
Engineer of 1969, R. E. Larson namedFeb 121	IEEE Group Divisions will nominate and elect Directors in 1970, Two new. Mar 121	International Symposium on Fault-Tolerant Computing, March 1971, Los Angeles.
Glen David Bergland and William George Scheerer honorably mentionedFeb 121 Eurocon '71, October 18–22, Lausanne, Swit-	IEEE insurance plan to give 50% dividend credit	International Symposium on Submillimeter Waves, March 31-April 2, New York,
zerland	IEEE offices, Committee requests nominees	N.Y
Exchange with U.S.S.R.'s Popov Society is planned. Dec 90	for Oct 110  IEEE Student Member dues to increase in 1971 Oct 111	Machines and Computations, Aug. 16–19, 1971, Haifa, Israel: Paper callOct 112 International Wire and Cable Symposium,
F	IEEE technical activities, A progress report on reorganization of Aug 113 IFAC/IFIP meeting scheduled for Finland	Dec. 2-4, 1970, Atlantic City, N.J.: Paper call
Fall Joint Computer Conference (1970),	(IFAC Symposium on the Control of Distrib-	Conference, September 21–25, 1970, Las Vegas: Paper callJan 119
Houston, Tex., November 17-19: Call for papersFeb 122 Computer graphics workshop will precede	uted Parameter Systems) Canadian con- ference is in need of abstractsAug 121 IFAC Symposium, Papers needed for 1971	Iowa State to host power systems conferenceAug 120 Israel, Laser symposium will be held in Apr 16
Fellow grade, IEEE Board of Directors announces election of outstanding contribu-	IFAC symposiums, Paper call issued for two	Israel plan technical meetings, Engineers of
tors to	IFIP Congress 71 requests contributions	Italian publication announces special issueFeb 15 (Italy) Communication workshop to be held in
Fellowships available in Latin America, Engineering. Sep 16	Industrial and Commercial Power Systems and Electric Space Heating and Air Condition- ing Joint Technical Conference, May 4–7,	June
'Fingerprint' technique distinguishes insulators		5011001 III
Fink D. G. to bond at 0 and a 1555	1970, San Francisco, to explore electrical safety	
Fink, D. G., to head staff study on IEEE participation in socioeconomic programs	1970, San Francisco, to explore electrical safety	J
Fink, D. G., to head staff study on IEEE	1970, San Francisco, to explore electrical safety	J  JACC to offer over 150 technical papers, 1970 (June 24–26)Jun 113  JACC, August 11–13, 1971, St. Louis, Mo.:

IEEE spectrum DECEMBER 1970

Japan, Fall conferences in Aug 108	Meeting to study geoscience electronics	Nominations invited, 'Men of science'
Jobs still available for engineering graduates Nov 20	Meetings, Calendar of IEEE. Jan. 26; Feb 18;	NRC Associateship programs afford research
Johnson, J. B., is David Sarnoll Award winner	Mar 26; Apr 19; May 17; June 22; Jul 20; Aug 23; Sep 18; Oct 18; Nov 24; Dec 21	opportunities Nov 22 NRC study, Postdoctoral education is analyzed
Joint Conference on Infrared Techniques,	Meetings, Engineers of Israel plan technical	inJan 25
Sept. 21–23, 1971, England: Papers invited	Meetings of Interest; Non-IEEEJan 28;	NSF grant goes to Engineering Index, Inc
Joint conference to explore electrical safety	Feb 20; Mar 28; Apr 21; May 19; June 23; Jul 21; Aug 24; Sep 19; Oct 19; Nov 25;	NSPE to admit nonregistered engineers Jul 16 Nuclear Power Systems Symposium, Nov. 4-6,
Joint Engineering Management Conference, October 29-30, 1970, Chicago Sep 111	Dec 22 'Men of science' nominations invited Nov 20	1970, New York, N.Y.: Session topicsOct 113
Joint G-AP and URSI meetings in need of	Meteorological satellites mark a decade in space	Nuclear Science Symposium, New York, N.Y.,
papers Mar 122  Joint Power Generation Conference, Sept 27–	Mexico City to host dual engineering confer-	November 4–7, 1970May 110, Sep 112 N.Y.U. engineering series, First colloquium
Oct. 1, 1970, Pittsburgh Sep 106  Joint Technical Conference on Electric Space	ence	held in Feb 16
Heating and Air Conditioning, May 3-6,	(MHD Electrical Power Generation) Papers	0
1971, Detroit, Mich.: Paper call Oct 113 Joint Transportation Engineering Conference,	solicited for international MHD conference	Ocean environment meeting will present more than 80 papers, First international
October 12–14, 1970, ChicagoSep 110  Journal reviews physics in technology, New	MHD program, Pollution-free generation is advantage ofFeb 16	Jul 107
Oct 14	Microelectronics seminar will cover advances to come	Officers and Directors are announced, Nominations for 1971 IEEEJun 112
K	Microprogramming workshop solicits papers	(Offishore Technical Conference) OTC estab- lishes two achievement awards May 107
Kouwenhoven, W. B., is named first recipient	Microwave Symposium (International), May	Offshore Technology Conference, Over 5000 engineers expected at 1970Apr 110
of new IEEE Power Group award May 104	17–20, 1971, Washington, D.C.: Papers needed	(Ohio University) Technology-society rela-
•	Microwave symposium will offer over 90 papers	Olson, Harry F., wins Lamme Medal
L Cl. D. L. F. Wisham II Assert and	The relevance of cooking with microwaves	OpCom forms committee on socioeconomic
LaChance, Ralph E., Hickernell Award presented to	Microwave Theory and Techniques to publish	problems Dec 89
Language and automation, New journal covers	special issue, Transactions on Feb 123 Microwaves for a better world is theme of	Р
Laser beam speeds transmission of data	symposium	Pacemaker allows heart to trigger itself, Ex-
Laser could control air pollution, Remote-	posium, Oct 27–30, 1970, Iowa Oct 113	perimental
controlOct 16  Laser developments include semiconductor and	Millman, Jacob, IEEE Education Medal to	Award Dec 90 Paintings to adorn IEEE Headquarters
'exciplex' devices, RecentOct 14  Laser link supplements Armenian telephone	Miniaturization involve IC structures, lasers, and light guides, New developments in	Particle Accelerator Conference, March 1-3,
cableJun 20 Laser pulses measure the rotation of molecules	M.I.T., Magnetic-field-free chamber built at	1971, Papers neededSep 106 Phosphors emit a full range of colors, New
Mar 22	M.I.T. to give course on optical communica-	Feb 15
Laser standard committee is formed, New Nov 22	tionMay 15	P.I.B. symposium, Politics and environmental pollution are stressed at marathon
Laser symposium will be held in Israel Apr 16 Laser velocimeter facilitates measuring. Feb 16	Monitoring system uses electronic 'roll call' to locate vehicles, New type of automatic	P.I.B.'s 21st symposium is on computers and
Lasers, and light guides, New developments in miniaturization involve IC structures	Mulligan, James H., Jr., elected 1970 IEEE	automata
	Mulligan, James H., Jr., elected 1970 IEEE Vice PresidentJan 112	automataNov 103
miniaturization involve IC structures Jun 18 Latin America, Engineering fellowships available in	Mulligan, James H., Jr., elected 1970 IEEE Vice PresidentJan 112	automata
miniaturization involve IC structures Jun 18 Latin America, Engineering fellowships available in Sep 16 Learning machine recognizes cost factor, New Feb 17	Mulligan, James H., Jr., elected 1970 IEEE	automata
miniaturization involve IC structures Jun 18 Latin America, Engineering fellowships available in	Mulligan, James H., Jr., elected 1970 IEEE Vice President	automata
miniaturization involve IC structures  Jun 18  Latin America, Engineering fellowships available in	NaE, Improved urban living will be considered by	automata
miniaturization involve IC structures Jun 18  Latin America, Engineering fellowships available in Sep 16  Learning machine recognizes cost factor, New Feb 17  Lefkowitz, Michael and David I. Durst win Student Prize Paper Award Feb 118  Lehigh adopts program in environmental sciences Oct 16  Lehigh University to sponsor open workshop Nov 107	NaE, Improved urban living will be considered by Jun 20 NAE panel notes social aspects of spectrum use Oct 15 NAS invites scientists to visit Eastern Europe	automata
miniaturization involve IC structures  Jun 18  Latin America, Engineering fellowships available in	NaE, Improved urban living will be considered by Jun 20  NAE panel notes social aspects of spectrum use Oct 15  NAS invites scientists to visit Eastern Europe Oct 14	automata
miniaturization involve IC structures Jun 18 Latin America, Engineering fellowships available in Sep 16 Learning machine recognizes cost factor, New Feb 17 Lefkowitz, Michael and David I. Durst win Student Prize Paper Award Feb 118 Lehigh adopts program in environmental sciences. Oct 16 Lehigh University to sponsor open workshop Nov 107 Leondes, Cornelius T., and George J. Friedman win W. R. G. Baker Prize Award Feb 118	NaE, Improved urban living will be considered by Jun 20  NAE panel notes social aspects of spectrum use Oct 15  NAS invites scientists to visit Eastern Europe Oct 14  (NAS and NAE) Ecological issues receive mounting national attention Aug 20	automata
miniaturization involve IC structures Jun 18 Latin America, Engineering fellowships available in	NaE, Improved urban living will be considered by. Jun 20  NAE panel notes social aspects of spectrum use. Oct 15  NAS invites scientists to visit Eastern Europe	automata
miniaturization involve IC structures  Jun 18  Latin America, Engineering fellowships available in  Sep 16  Learning machine recognizes cost factor, New Feb 17  Lefkowitz, Michael and David I. Durst win Student Prize Paper Award Feb 118  Lehigh adopts program in environmental sciences Oct 16  Lehigh University to sponsor open workshop Nov 107  Leondes, Cornelius T., and George J. Friedman win W. R. G. Baker Prize Award Feb 118  Letov, A. M., of U.S.S.R. speaks to Huntsville Section Nov 101  Life Member Fund continues its projects Dec 89	NaE, Improved urban living will be considered by. Jun 20  NAE panel notes social aspects of spectrum use  Oct 15  NAS invites scientists to visit Eastern Europe  Oct 14  (NAS and NAE) Ecological issues receive mounting national attention. Aug 20  (NAS meeting) Austerity comes to funding for science. Jul 14  (National Council of Engineering Examiners)  Publication reviews engineering registra-	automata
miniaturization involve IC structures	NaE, Improved urban living will be considered by	automata. Nov 103 PICA 1971 to study prognosis for the '70s. Jul 109 Plasmas, Special Proceedings issue will study (Pollution and environment) Our decaying environment top-priority issue for the '70s May 11 Pollution are stressed at marathon P.I.B. symposium, Politics and environmental Dec 16 Pollution-free generation is advantage of MHD program Feb 16 Pollution problem, Engineers will study air Feb 16 Popov Society is planned, Exchange with U.S.S.R.'s Dec 90 Postdoctoral education is analyzed in NRC study Jan 25 Power Meeting to focus on power apparatus, Winter (1970) Jan 120
miniaturization involve IC structures	NaE, Improved urban living will be considered by. Jun 20  NAE panel notes social aspects of spectrum use  Oct 15  NAS invites scientists to visit Eastern Europe  Oct 14  (NAS and NAE) Ecological issues receive mounting national attention. Aug 20  (NAS meeting) Austerity comes to funding for science. Jul 14  (National Council of Engineering Examiners)  Publication reviews engineering registration. Nov 23  National Telemetering Conference and Exposition, April 12–15, 1971. Sep 112	automata
miniaturization involve IC structures  Jun 18  Latin America, Engineering fellowships available in	NaE, Improved urban living will be considered by. Jun 20 NAE panel notes social aspects of spectrum use Oct 15 NAS invites scientists to visit Eastern Europe Oct 14 (NAS and NAE) Ecological issues receive mounting national attention Aug 20 (NAS meeting) Austerity comes to funding for science. Jul 14 (National Council of Engineering Examiners) Publication reviews engineering registration Nov 23 National Telemetering Conference and Exposition, April 12–15, 1971 Sep 112 N.C. Sections to hold annual symposium Oct 112	automata
miniaturization involve IC structures Jun 18 Latin America, Engineering fellowships available in Sep 16 Learning machine recognizes cost factor, New Feb 17 Lefkowitz, Michael and David I. Durst win Student Prize Paper Award Feb 118 Lehigh adopts program in environmental sciences. Oct 16 Lehigh University to sponsor open workshop Nov 107 Leondes, Cornelius T., and George J. Friedman win W. R. G. Baker Prize Award Feb 118 Letov, A. M., of U.S.S.R. speaks to Huntsville Section. Nov 101 Life Member Fund continues its projects Dec 89 London conference, Aerospace antennas is subject of Dec 92 Long-lived thermionic device is fossil-fueled	NaE, Improved urban living will be considered by. Jun 20 NAE panel notes social aspects of spectrum use Oct 15 NAS invites scientists to visit Eastern Europe Oct 14 (NAS and NAE) Ecological issues receive mounting national attention Aug 20 (NAS meeting) Austerity comes to funding for science Jul 14 (National Council of Engineering Examiners) Publication reviews engineering registration. Nov 23 National Telemetering Conference and Exposition, April 12–15, 1971 Sep 112 N.C. Sections to hold annual symposium Oct 112 NEC (1969) awards presented to six electronics engineers Feb 124	automata
miniaturization involve IC structures	NAE, Improved urban living will be considered by. Jun 20  NAE panel notes social aspects of spectrum use Oct 15  NAS invites scientists to visit Eastern Europe Oct 14  (NAS and NAE) Ecological issues receive mounting national attention. Aug 20  (NAS meeting) Austerity comes to funding for science. Jul 14  (National Council of Engineering Examiners) Publication reviews engineering registration. Nov 23  National Telemetering Conference and Exposition, April 12–15, 1971. Sep 112  N.C. Sections to hold annual symposium. Oct 112  NEC (1969) awards presented to six electronics engineers. Feb 124  NEC, December 7–9, 1970, Chicago, Ill.; Papers sought. Mar 121	automata
miniaturization involve IC structures  Jun 18  Latin America, Engineering fellowships available in	Nae, Improved urban living will be considered by	automata
miniaturization involve IC structures	NAE, Improved urban living will be considered by. Jun 20  NAE panel notes social aspects of spectrum use Oct 15  NAS invites scientists to visit Eastern Europe Oct 14  (NAS and NAE) Ecological issues receive mounting national attention. Aug 20  (NAS meeting) Austerity comes to funding for science. Jul 14  (National Council of Engineering Examiners) Publication reviews engineering registration. Nov 23  National Telemetering Conference and Exposition, April 12–15, 1971. Sep 112  N.C. Sections to hold annual symposium. Oct 112  NEC (1969) awards presented to six electronics engineers. Feb 124  NEC, December 7–9, 1970, Chicago, Ill.: Papers sought Mar 121 Program. Nov 96  NEC, October 18–20, 1971, Chicago, Ill.: Needs papers Nov 104	automata. Nov 103 PICA 1971 to study prognosis for the '70s. Jul 109 Plasmas, Special Proceedings issue will study (Pollution and environment) Our decaying environment top-priority issue for the '70s. May 11 Pollution are stressed at marathon P.I.B. symposium, Politics and environmental Dec 16 Pollution-free generation is advantage of MHD program Feb 16 Pollution problem, Engineers will study air. Feb 16 Popov Society is planned, Exchange with U.S.S.R.'s Dec 90 Postdoctoral education is analyzed in NRC study Jan 25 Power Meeting to focus on power apparatus, Winter (1970). Jan 120 Power Processing Specialists Conference, April 19–20, 1971, Pasadena, Calif Nov 102 Power supply described that uses no transformers. Apr 17 Power systems conference, Iowa State to host Aug 120 Power systems in the '70s Purdue symposium theme. Mar 25
miniaturization involve IC structures  Jun 18  Latin America, Engineering fellowships available in	Nae, Improved urban living will be considered by. Jun 20 NAE panel notes social aspects of spectrum use Oct 15 NAS invites scientists to visit Eastern Europe	automata
miniaturization involve IC structures	NAE, Improved urban living will be considered by. Jun 20 NAE panel notes social aspects of spectrum use Oct 15 NAS invites scientists to visit Eastern Europe	automata
miniaturization involve IC structures	NAE, Improved urban living will be considered by. Jun 20  NAE panel notes social aspects of spectrum use Oct 15  NAS invites scientists to visit Eastern Europe Oct 14  (NAS and NAE) Ecological issues receive mounting national attention. Aug 20  (NAS meeting) Austerity comes to funding for science. Jul 14  (National Council of Engineering Examiners) Publication reviews engineering registration. Nov 23  National Telemetering Conference and Exposition, April 12–15, 1971. Sep 112  N.C. Sections to hold annual symposium. Oct 112  NEC (1969) awards presented to six electronics engineers. Feb 124  NEC, December 7–9, 1970, Chicago, Ill.: Papers sought Mar 121  Program. Nov 96  NEC, October 18–20, 1971, Chicago, Ill.: Needs papers Nov 104  NEC to offer two professional growth seminars Jan 120  Neptunium lifetime is measured directly. Sep 17  NEREM, Nov. 4–6, 1970, Boston, Mass.: Seeks technical papers Mar 121	automata
miniaturization involve IC structures	Nae, Improved urban living will be considered by. Jun 20 NAE panel notes social aspects of spectrum use Oct 15 NAS invites scientists to visit Eastern Europe	automata
miniaturization involve IC structures	NAE, Improved urban living will be considered by. Jun 20  NAE panel notes social aspects of spectrum use Oct 15  NAS invites scientists to visit Eastern Europe Oct 14  (NAS and NAE) Ecological issues receive mounting national attention. Aug 20  (NAS meeting) Austerity comes to funding for science. Jul 14  (National Council of Engineering Examiners)  Publication reviews engineering registration. Nov 23  National Telemetering Conference and Exposition, April 12–15, 1971. Sep 112  N.C. Sections to hold annual symposium. Oct 112  NEC (1969) awards presented to six electronics engineers. Feb 124  NEC, December 7–9, 1970, Chicago, Ill.: Papers sought Mar 121  Program. Nov 96  NEC, October 18–20, 1971, Chicago, Ill.: Needs papers. Nov 104  NEC to offer two professional growth seminars Jan 120  Neptunium lifetime is measured directly. Sep 17  NEREM, Nov. 4–6, 1970, Boston, Mass.: Seeks technical papers. Jan 86; Feb 95; Mar 90; Apr 84; May 81; Jun 87; Jul 84; Aug 95; Sep 85; Oct 87; Nov 80; Dec 76	automata
miniaturization involve IC structures	NAE, Improved urban living will be considered by. Jun 20  NAE panel notes social aspects of spectrum use Oct 15  NAS invites scientists to visit Eastern Europe Oct 14  (NAS and NAE) Ecological issues receive mounting national attention. Aug 20  (NAS meeting) Austerity comes to funding for science. Jul 14  (National Council of Engineering Examiners) Publication reviews engineering registration. Nov 23  National Telemetering Conference and Exposition, April 12–15, 1971. Sep 112  N.C. Sections to hold annual symposium. Oct 112  NEC (1969) awards presented to six electronics engineers. Feb 124  NEC, December 7–9, 1970, Chicago, Ill.: Papers sought Mar 121  Program. Nov 96  NEC, October 18–20, 1971, Chicago, Ill.: Needs papers. Nov 104  NEC to offer two professional growth seminars Jan 120  Neptunium lifetime is measured directly. Seeks technical papers. Mar 121  Program. Oct 107  New product applications. Jan 86; Feb 95; Mar 90; Apr 84; May 81; Jun 87; Jul 84; Aug 95; Sep 85; Oct 87; Nov 80; Dec 76  News from Washington. Jan 15; Feb 11; Mar 15; Feb 11; Mar 15; May 11; Jul 11;	automata
miniaturization involve IC structures  Jun 18  Latin America, Engineering fellowships available in	NAE, Improved urban living will be considered by. Jun 20  NAE panel notes social aspects of spectrum use Oct 15  NAS invites scientists to visit Eastern Europe Oct 14  (NAS and NAE) Ecological issues receive mounting national attention. Aug 20  (NAS meeting) Austerity comes to funding for science. Jul 14  (National Council of Engineering Examiners)  Publication reviews engineering registration. Nov 23  National Telemetering Conference and Exposition, April 12–15, 1971. Sep 112  N.C. Sections to hold annual symposium. Oct 112  NEC (1969) awards presented to six electronics engineers. Feb 124  NEC, December 7–9, 1970, Chicago, Ill.: Papers sought Mar 121  Program. Nov 96  NEC, October 18–20, 1971, Chicago, Ill.: Needs papers. Nov 104  NEC to offer two professional growth seminars Jan 120  Neptunium lifetime is measured directly. Sep 17  NEREM, Nov. 4–6, 1970, Boston, Mass.: Seeks technical papers. Mar 121  Program. Oct 107  New product applications. Jan 86; Feb 95; Mar 90; Apr 84; May 81; Jun 87; Jul 84; Aug 95; Sep 85; Oct 87; Nov 80; Dec 76  News from Washington. Jan 15; Feb 11; Mar 15; Apr 11; May 9; Jun 11; Jul 11; Aug 15; Sep 11; Oct 11; Nov 15; Dec 13	automata
miniaturization involve IC structures	NAE, Improved urban living will be considered by. Jun 20 NAE panel notes social aspects of spectrum use Oct 15 NAS invites scientists to visit Eastern Europe	automata
miniaturization involve IC structures	NAE, Improved urban living will be considered by. Jun 20 NAE panel notes social aspects of spectrum use Oct 15 NAS invites scientists to visit Eastern Europe Oct 14 (NAS and NAE) Ecological issues receive mounting national attention. Aug 20 (NAS meeting) Austerity comes to funding for science. Jul 14 (National Council of Engineering Examiners) Publication reviews engineering registration. Nov 23 National Telemetering Conference and Exposition, April 12–15, 1971. Sep 112 N.C. Sections to hold annual symposium. Oct 112 NEC (1969) awards presented to six electronics engineers. Feb 124 NEC, December 7–9, 1970, Chicago, Ill., Papers sought. Mar 121 Program. Nov 96 NEC, October 18–20, 1971, Chicago, Ill., Needs papers. Nov 104 NEC to offer two professional growth seminars Jan 120 Neptunium lifetime is measured directly. Seeks technical papers. Mar 121 Program. Oct 107 New product applications. Jan 86; Feb 95; Mar 90; Apr 84; May 81; Jun 87; Jul 84; Aug 95; Sep 85; Oct 87; Nov 80; Dec 76 News from Washington. Jan 15; Feb 11; Mar 15; Apr 11; May 9; Jun 11; Jul 11; Aug 15; Sep 11; Oct 11; Nov 15; Dec 13 News of IEEE becomes Inside IEEE. Dec 89 Nominations for IEEE awards now open	automata
miniaturization involve IC structures	NAE, Improved urban living will be considered by. Jun 20 NAE panel notes social aspects of spectrum use Oct 15 NAS invites scientists to visit Eastern Europe Oct 14 (NAS and NAE) Ecological issues receive mounting national attention. Aug 20 (NAS meeting) Austerity comes to funding for science. Jul 14 (National Council of Engineering Examiners) Publication reviews engineering registration. Nov 23 National Telemetering Conference and Exposition, April 12–15, 1971. Sep 112 N.C. Sections to hold annual symposium. Oct 112 NEC (1969) awards presented to six electronics engineers. Feb 124 NEC, December 7–9, 1970, Chicago, Ill.: Papers sought Mar 121 Program. Nov 96 NEC, October 18–20, 1971, Chicago, Ill.: Needs papers. Nov 104 NEC to offer two professional growth seminars Jan 120 Neptunium lifetime is measured directly. Sep 17 NEREM, Nov. 4–6, 1970, Boston, Mass.: Seeks technical papers. Jan 87; Jul 84; Aug 95; Sep 85; Oct 87; Nov 80; Dec 76 News from Washington. Jan 15; Feb 11; Mar 15; Apr 11; May 9; Jun 11; Jul 11; Aug 15; Sep 11; Oct 11; Nov 15; Dec 13 News of IEEE becomes Inside IEEE Dec 89 Nominations for Fellows due by April 1971	automata. Nov 103 PICA 1971 to study prognosis for the '70s. Jul 109 Plasmas, Special Proceedings issue will study (Pollution and environment) Our decaying environment top-priority issue for the '70s. May 11 Pollution are stressed at marathon P.I.B. symposium, Politics and environmental Dec 16 Pollution-free generation is advantage of MHD program Feb 16 Pollution problem, Engineers will study air. Feb 16 Popov Society is planned, Exchange with U.S.S.R.'s Dec 90 Postdoctoral education is analyzed in NRC study. Jan 25 Power Meeting to focus on power apparatus, Winter (1970). Jan 120 Power Processing Specialists Conference, April 19–20, 1971, Pasadena, Calif Nov 102 Power supply described that uses no transformers. Apr 17 Power systems conference, Iowa State to host Aug 120 Power systems in the '70s Purdue symposium theme. Mar 25 Proceedings back issues available, IEEE. Feb 124 Proceedings issue to feature engineering education. Apr 114 Proceedings issue, Papers wanted for Sep 108 Proceedings issue will study plasmas, Special Apr 118 Proceedings on computers in design in need of papers. Sep 110 Proceedings special issue needs abstracts Aug 120 (Publication) New journal covers language and automation Nov 23 Publications bulletin, IEEE announces current Sep 111 (Pulp and Paper Industry Conference) Papers

### R

Race across the United States, Electric car enthusiasts are invited to compete in a
Race data to viewers, Electronics will speed auto. Oct 17 Race, Transcontinental route set for 'clean-air' vehicle. Jul 16 Radiation effects meeting, La Jolia is the site of
Radio astronomy; Dicke Panel scores effects of fund freeze on U.S. Jan 20 Railroad Conference has a nonnational flavor, 1970 Joint (April 7–8) Jun 14 Rate sensor developed to compete with gyroscope. Oct 17 Rating system revised for wire-round resistors
Jul 16 Reference collection published (by Engineering Societies Library), New Aug 120 (Region 3) Contributions needed for Southeast convention Aug 121 Region 6 Conference, May 26–28, 1970, Washington, D.C.: Program Apr 108 Region 6 conference (1971) seeks papers
Region 8 to sponsor Eurocon '71, the first European convention providing an inter- national forum. Oct 106 Registration, Publication reviews engineering
Reliability physics meeting to be held in Nevada (April 7–9, 1970)
Reliability Symposium, January 12-14, 1971, Washington, D.C.: Will try to meet new demands. Nov 101 Reorganization of IEEE technical activities, A progress report on. Aug 113 Retinal research, Holography made safe for use in. Jul 17 Rhodes, John David wins, Browder J. Thompson Memorial Prize Award. Feb 118 Rinia, Herre, to receive the IEEE Award in International Communication. Nov 94 Rocky Mountain Bioengineering Symposium, May 3-5, 1971, Fort Collins, Colo., scheduled. Dee 92 Rubber and Plastics Conference, April 6-7, 1970, Akron, Ohio. Mar 126 Ryle, Martin, to receive Morris N. Liebmann Award. Dee 90

### S

Safety, Update Medical Electrical (Seminar)
Salaries are higher for engineering technicians
Sarnoff Award winner, J. B. Johnson is David
Sarnoit Award winner, J. B. Johnson is David
Satellite system planned by AT &T, Domestic
Satellites mark a decade in space, Meteorologi-
calMay 14 Scanning the issuesJan 92; Feb 101;
Mar 98; Apr 90; May 88; Jun 94; Jul 90; Aug 101; Sep 91; Oct 93; Nov 86; Dec 82
Aug 101; Sep 91; Oct 93; Nov 86; Dec 82 Schroeder, Alfred C., to receive the Vladimir
K. Zworykin Award Nov 96 Section officers, Special workshops are
Section officers, Special workshops are
trainingDec 89 Semiconductors, Transactions to study amor-
phousApr 118 Sensors meeting announces program. Apr 116
Silverstein. Abe to receive first Medal of
Achievement from CECONJan 121 Smith, James E., wins Student Prize Paper
Award (Second Prize)Feb 118 (Society of Engineering Science annual meet-
ing) Papers are needed on environmental
engineering
mittee on
Solid-state circuits conference calls for papers
Solid-state devices conference to be held
Solid-State Sensors Symposium, Minneapolis,
vinn., June 18–19, 1970, announces pro-
gram
Special issue, Automatic control to be the
Subject of Ind 108
(Special issue) Information display to receive special attention
special attentionAug 116

Special issue (September 1971) needs abstracts, Proceedings
Special issue wants sensor research papers,
Transactions
Special issue wants sensor research papers, Transactions
Standards are available, Revised electrical
Standards are available, Revised electrical Standards are issued by EIA, New Dec 19 Standards group for solid-state products formed Oct 17 Standards issued for luminaire attachments.
Summer Computer Simulation Conference
Standards are issued by EIA, New Dec 19 Standards group for solid-state products formed
Summer Power Meeting and International Symposium on High Power Testing, July 18–23, 1971, Portland, Ore.: Calls for papers
Summer's heat and the electric power supply
Summer's heat and the electric power supply Dec 18 Superconductor combines metal and glass, New. Jul 18 Surgery, Electrons control body temperature during. Jun 20 SWIEEECO, April 28–30, 1971, Houston, Tex.: First call for papers. Dec 92 SWIEEECO will offer 23 technical sessions and 135 exhibits, 1970. Apr 110 Switzerland to host digital processing meeting Mar 124
Surgery, Electrons control body temperature during Jun 20
SWIEEECO, April 28–30, 1971, Houston, Tex.:
SWIEEECO will offer 23 technical sessions
Switzerland to host digital processing meeting
Symposium on Feature Extraction and Selection in Pattern Recognition, Argonne, Ill, October 5–7, 1970: Papers needed.
Symposium on Man-Machine Systems, Winter
Park, Fla., November 12–13, 1970: Papers requested
Calif.: Papers needed
Symposium will discuss medical electrical
System Theory Symposium (Southeastern),
Symposium on the Operator, Engineer and Management Interface with the Process Control Computer, August 3–6, 1971: Papers solicited
т
Tables of contents, AdvanceJan 94; Feb 103; Mar 100; Apr 93; May 90; Jun 96
Technology-society relationship is probed
Telemetering Conference, Los Angeles to host
Telephone cable, Laser link supplements Armenian Jun 20
speed up callsJul 18 Thermionic device is fossil-fueled, Long-lived
May 15 Third European Conference on Semiconductor Device Research, Mar 30-Apr 2, 1971, Munich, Germany: Paper callOct 112
Tilson, Seymour, dies; was Spectrum staff writer
Transactions to study amorphous semiconduc-
tors
tors
U
Ultrasonics Symposium (October 21–23, 1970,
San Francisco)Jun 113, Jul 108 Underground Distribution Conference, Papers solicited
Unemployed engineers Dec 19 (Union Carbide) Two developments may spark
smaller, faster ICsSep 16

UPADI convention to take place in	Bue	nos
Aires.  Update Medical Electrical Safety Syn May 15, 1970, Philadelphia, Pa., cuss medical electrical safety.	iposii	um
cuss medical electrical safety	Apr	114
Urban living will be considered by Improved.  USIA announces volunteer speaker of USNC/URSI-IEEE Spring Meeting 8–10, 1971, Washington, D.C. for abstracts.	y Nz Jur	AE 1-20
USIA announces volunteer speaker s	servic	e .
USNC/URSI-IEEE Spring Meeting	$\mathbf{A}\mathbf{p}\mathbf{r}$	ri. pri
8–10, 1971, Washington, D.C.	: C	alls 107
V		
van Duuren, H. C. A., recipient of IEI Award for 1970.  Vehicular Technology Group Cor December 2–4, 1970, Washingtoi In need of papers Features two government speakers.  Velocimeter facilitates measuring, Las  Video-taped material to color film, N cess enables conversion of  Vogel, Fred J., to receive William M shaw Award	EE F	iele
Vehicular Technology Group Cor	, Jan iferer	nce,
December 2-4, 1970, Washington	n, D.	C.
Features two government speakers.	Nov	102
Velocimeter facilitates measuring, Las	ser. Feb	16
Video-taped material to color film, N	ew p	ro-
Vogel, Fred J., to receive William M	. Hal	oir-
shaw Award	Nov	94
W		
Weber, Ernst, named NRC division c	hairn	an
WESCON (1970), Aug 25–28, Los An Call for sessions. Program. Exhibitors	Mar	122
Call for sessions	Jan	120
Program Exhibitors	. Jul   . Jul	102 114
Western Space Congress (First), Oct	. 27–	29,
1970, Santa Maria, Cani Frogra	Oct	iii
Conference, A double header for	r Pov r July	vei v
Westinghouse 'school' and the Summe Conference, A double header for WFEO meets in May, Information co	.Sep	14
of	Sep 1	06
and Electronics Systems, Feb.	rosp: 10	ace 12,
(WINCON) Winter Convention on Acand Electronics Systems, Feb. 1970, Los Angeles, Calif	Jan 1	118
Winter Power Meeting (January 31–F 5,1971), New York, N. Y.: Contr	Apr 1	19
5, 1971), New York, N. Y.: Contr	ibutio	ary ons
necded for	Juni	0.4
Will have varied program	. Dec	91
makes	. Aug	21
Women engineers plan June convention	n May	16
Will have varied program.  Wire by squeezing, High-pressure makes.  Women engineers plan June convention  Workshop, Lehigh University to spons	or or	en 07
Workshop on Microprogramming (Thenual), Bulfalo, N.Y., Oct 12-13	ird A	in-
Solicits papers	, 19 Apr 1	70: [14
Workshop scheduled, Pattern recognit	ion	iġ
Solicits papers. Workshop scheduled, Pattern recognit (Workshop) Shield current effects is su	ibject	of
Workshop to be hold in Italy in Italy	Co	133-
munication	Apr office	17 rs.
Special	Dec	89
People		
Aaron, M. Robert	Aay 1	16
Aitken, Theodore B	Aay l Aav 1	16
Alford, Robert	Sep 1	16
Aiton, M. Robert Aitken, Theodore B. M. Aklufi, Monti E. M. Alford, Robert Anderson, Tore N. M. Armstrong, Clarence J. M. Avakian, Avak	lay 1	16
Avakian, Avak	Jul l	13
В		
Railey Stuart I Aug 122.	Dec	95
Balakian, George	Sep 1 Apr 1	16 22
Battison, John H. Baum, Willard U. Beam, Walter R. Jan 122,	Oct 1	16
Beam, Walter R Jan 122.	Sep 1	15

Baney, Stuart L Aug 122, Dec 93
Balakian, GeorgeSep 116
Banks, Donald SApr 122
Battison, John HOct 116
Baum, Willard USep 115
Beam, Walter R Jan 122, Sep 115
Beaudoin, Leonard W
Benjamin, Robert BJul 113
Berg, Robert EJan 124
Blanton, H. ElmoreSep 116
Bond, M. LloydAug 124
Bowman, Robert Alexander May 113
Boyce, Wilson E. L Mar 131
Boyers, John S Feb 126
Brainerd, John GSep 114

Bravo, Richard J Brenner, Bernard M Brown, John Brown, Lincoln. Bucy, J. Fred Burke, James L Burley, Cameron H Burns, Claude H Burns, Thomas S	May 116 Oct 116 Jan 124 Sep 116 Oct 116 Sep 116 Aug 124	Ham, William E Oct 117 Hamburger, Ferdinand, Jr. Jun 115 Hansel, Paul G Feb 126, Jun 115 Haslach, Frank X. Aug 124 Helf, William May 117 Hernqvist, Karl G. May 114 Herold, Edward W. Apr 121 Hirsch, Donald Sep 116 Hodges, David A. Mar 131 Hopper, Grace Murray Dec 94 Horing, Sheldon Jul 113	Nathanson, F. E Neidig, Ralph E Nelson, Rolland D Noorda, Raymond J Norsell, Paul E Notthoff, Arthur P  O O'Bryan, Henry M	Jan 122 Apr 123 Jul 113 Sep 117 Mar 132
Cagle, William B. Canaday, Rudd H. Carr, Richard A. Casselberry, Robert L. Chang, Wilbert H. K. Cheng, David K. Cheo, Peter K. Chermak, Jess. Christiaanse, R. Clampitt, Lawrence L. Clark, George L.	Sep 116 Apr 122 May 116 Mar 131 Feb 125 Aug 124 Nov 108 Sep 117 Apr 122	Hossack, Alexander. Sep 116 Hottenstein, John M. Sep 116 Hovnanian, H. Philip. Sep 116 Hudson, Kenneth Sep 116 Huggins, William Herbert May 114 Hultberg, Richard M. Oct 117 Huse, Raymond A. Aug 124  Irland, Edwin A. Sep 116	Page, Orville D. Pankove, Jacques I. Patel, C. Kumar N. Patel, Kirtikumar D. Phelan, Robert J., Jr. Phillips, Arthur H. Phillips, Herbert. Pierce, John R. Pierstorff, Buckley C. Pruitt, J. A.	May 114 Nov 108 May 117 Mar 132 Apr 121 Feb 126 Aug 122 Sep 117
Cleeton, Claud E. Clement, Ernest P. Cole, William P. Coover, Mervin S. Crockett, E. David. Cullum, A. Earl, Jr. Cumming, Laurence G. Cutler, Cassius Chapin.		Jacobs, Charles E. Apr 123 Jacobs, Richard M. Oct 117 James, George E. Jul 113 Jamieson, John A. Feb 126 Jones, Edwin C. Jul 113 Jones, Melvin C. Sep 116	Quate, Calvin ForrestQuick, Charles E	Jun 115
Dalziel, Charles F David, Edward E., Jr Davis, Edward M., Jr Dayton, G. R Dickey, David V Dickieson, Alton C Dissmeyer, E. F	Jul 112, Oct 114 Jan 124 Apr 123 Oct 117 May 114, Oct 114	K         K         Kahn, Walter K.       Aug 124         Kalmus, Henry P.       Dec 95         Kamen, Ira       Nov 108         Karni, Shlomo       Jun 115         Keller, James J.       Sep 116	Rader, Louis Telemacus Ramo, Simon Richman, Walter A Richmond, George E Rindner, Wilhelm Rock, Arthur Rockwell, Charles F Rosenberg, Paul Rukin, Michael B	Oct 116 May 117 Sep 117 Sep 117 Sep 117 Sep 117 Feb 126 May 114
Dobson, Douglas R. Doherty, William H. Dougherty, Charles R. Dowis, William J. Draper, Charles Stark Drechsler, William G. Dull, William M. Durham, E. E. Dutta Roy, Suhash C. Duvall, Donald D.	Mar 130 Jan 124 Jun 115 May 116 Feb 126 Apr 123 Oct 117 May 116	Ketchledge, Raymond Waibel         May 114           Kienzle, Harry G         May 117           Kilby, Jack S         Apr 121           Kim, Hyung K         Apr 123           King, Dewey C         Aug 124           Kinnally, John W         May 117           Kiser, Lonnie H         Mar 131           Koga, Issac         Jul 112           Kohavi, Igal         Apr 123           Koulopoulos, Michael J         Apr 123	Sandell, Donald H	Mar 130 Jan 123 Oct 117 Apr 123 Oct 117 Aug 125
E Eisenberg, Melvin	Aug 124 Oct 117 May 114	Kretzmer, Ernest R. Sep 116 Kudlich, Robert A. Apr 123 Kunz, William J. Nov 108 Kupersmith, Frederic Jan 124 Kuras, Henry F. Apr 123  L Lamb, James J. Aug 122 Lane, John E. Oct 117	Serang, Abdulgafoor M Shank, Robert J Sharpless, William M Shelton, Gerald O Shepherd, Mark, Jr. Shew, E. Barrett Shipway, Ron. Siegelman, Abe. Simons, John C., Jr. Simrall, Harry C	Aug 125 Jul 112 Feb 125 Nov 108 May 114 Oct 116 Oct 117 Jan 124 Mar 132
Fair, Irwin E Fannin, David Ronald Farison, James B Feder, Louis Feldman, David Finch, William G. H Fischer, Laurin G Fischer, Will S	Apr 123 Mar 131 Sep 116 Aug 124 Jan 122 Sep 116 Aug 124 Aug 124 Aug 124	Lanes, Michael M. Sep 116 Lauber, Thornton S. May 117 Law, Gordon F. Sep 117 Lee, Tzse K. Jan 124 Leeds, Winthrop, M. Nov 108 Lehan, Frank Welborn May 114 Leverenz, Humboldt Walter May 114 Light, Philip H. Apr 121 Light, Robert H. Nov 108	Skinner, Robert S Slinkman, Roger W Snith, George W., Jr. Smith, Richard T. Smullin, Louis Dijour. Sobol, Harold. Speights, Marion T. Spiro, George. Stagg, Glenn W	Oct 117 Jul 113 Aug 125 Mar 132 May 114 Oct 117 Nov 108 Nov 108 Sep 117
Fitzpatrick, Frank R Fleckenstein, William O. Fletcher, James Chipman Fox, Jack O. Franklin, C. Wayne Fruchter, Charles L. Fulton, Forest F	Sep 116 Oct 117 May 114 Oct 117 Nov 108 Jun 115	Linden, Albert E.       Jul 113         Linden, Donald A.       Apr 123         Linder, Clarence H.       Jun 115         Lipsky, Stephen E.       Oct 117         Longo, Thomas A.       Jul 113         Loomis, George L.       Mar 131         Lorenzen, Howard O.       Jul 112         Lundstrom, Alexis A.       Oct 115         Lusignan, Joseph T.       Sep 115         Lutton, Thomas C.       Jul 113	Stark, James A Staton, Maurice G Stegeman, Arthur J Stevenson, George D Stewart, Howard G Stoddard, Don J., Jr Strobel, Lawrence A Suffield, Frederick G Swonger, Claron W	May 117 May 117 Nov 109 Aug 125 May 117 Feb 126 May 117 Apr 124 Sep 117
Gable, James G Geanes, Zachary K. Gerber, Eduard A. Gifford, Richard P. Gift, Frank. Gill, Baldev S Gillespie, Albert. Goldberg, Harold S. Goldmark, Peter C. (correct Gould, Roy W Grady, Thomas J	Oct 117 Oct 116 Jun 115 Sep 116 Sep 116 Jul 113 Sep 116 Jul 113 Sep 116 Aug 124 Feb 126	Macdonald, James Ross	Tabak, Daniel	Nov 109 Feb 125 Oct 116 Apr 124 Jul 113 Apr 121
Graham, Robert E Granger, John V. N. Grayzel, Alfred I Green, Paul E., Jr Grove, Andrew S.	May 116 Apr 123 Mar 130 Sep 117	Moore, Gordon E.         Sep 117           Morgan, J. Derald.         Jul 113           Morrison, Laurence W.         Sep 115           Moskowitz, Ronald.         Jan 124           Mueller, Charles F.         Aug 124           Mumford, Lloyd G.         Aug 124           Myers, John E.         Jan 124	Vail, Charles R Van Meter, James L Vrattos, George P	Aug 125
Haddad, Jerrier A Haggerty, Patrick E Hall, Albert Carruthers	Sep 114, Dec 94	Nash, Harold ENov 108	Wang, C. C Wargo, Peter	Sep 114

HEEE spectrum DECEMBER 1970

	Waynick, Arthur HJan 124	Elzenbeck, David HMay 117	Lukens, Thomas Moore
	Weber, L. C	Engwicht, Harry	Lyon, George
	Weller, Richard I Oct 117 Weppler, H. Edward Aug 122	Everingham, Lloyd RApr 125	M
	Weston, Simeon	F	Machael, Russell L
	Willenbrock, F. Karl. Apr 121 Williams, Burgess E. Apr 124	Faber, John Lewis Jan 125	McCloskey, Robert Louis Jun 117 McCulloch, Warren S Jan 124
lių	Wischmeyer, Carl RSep 114	Fischer, Reinhard M. O Apr 125 Franklin, Charles Sidney Mar 133	McDuffie, Thomas EJan 125
1	Wood, W. Lewis, Jr	Frolunde, Jens Vium	McMaster, Robert Keith Mar 133 McNaughton, Edward F Apr 125
	Wuerz, John MOct 117		McNeill, Ralph Waldo
	Z	G. Carran Dan v Nail	Menear, Walter R. Jan 125 Metcalfe, George Jan 125
	Zuran, Joseph	Garnett, Roger NeilJan 125 Gawler, Henry CApr 125	Miller, Gerald KApr 125
	,,,	Gay, Frazer Walker	Mills, Charles William Jan 125 Mintz, Nathaniel M. Jan 125
	Obituarias	Goodwin, Carl V. Jan 125 Graham, Virgil M. Jun 117	Mitchener, Harry G Apr 125 Mitschrich, Melville F Nov 109
	Obituaries	Graves, Herbert Cornelius, Jr Mar 133	Moore, Charles Gilbert
	Abakumoff, Konkordy V Apr 124 Anderson, Frederick Edward Jan 125	Green, Frederick A Jan 125 Greene, Carl Kennedy Mar 133	Morgan, Frank I Feb 127 Morris, Benn G Apr 125
	Anderson, Stewart Wise Nov 109	Griesemer, Olin Alfred Mar 133 Grove, Alexander C Feb 127	Moss, Charles MacLean
	В	Guillemin, Ernst AJun 116	Muller, John WilliamJan 125 Murton, Chandler RApr 125
		Н	Musker, Alexander W
	Bailey, Glenn Keneson	Hammer, Fletcher H Mar 133	N
	Ballentine, Edwin CharltonFeb 127 Barker, HerbertApr 124	Hananel, Marco D	Nosty, Andrew EJan 125
	Barnard, Robert B	Hansen, Klaus Lobeck	Nosty, Andrew E
	Barris, H. Allen	Hartley, Ralph V. L Aug 125 Havstad, Harald Hansen Apr 125	0
	Benson, Robert WApr 125	Hawkes, Christian JohnApr 125	O'Hare, Francis William Jun 117
	Berring, Henry Feb 127 Black, Walter Alexander Mar 133	Healy, Daniel W., Jr.       Jan 125         Hessel, John       Jan 125	Ohtsuki, Takashi Feb 127 Oldenburger, Rufus Mar 133
	Bloomberg, Jerome	Higgins, Paul WFeb 127 Hobbs, Charles FApr 125	Oliver, Cuthbert JackJun 117
	Boisen, Lars Nannestad Apr 125 Booth, James D Jun 117	Hook, Gerald EApr 125 Hooper, Edgar MaxwellApr 125	Overmiller, Clair Marcellis Mar 133
	Bostad, John Mar 133 Boudreaux, Felix Joseph Jan 125	Horwitz, Phillip S. Feb 127 Hudgings, Daniel W. Mar 133	P
	Breiner, Harry D Mar 133	Hute, Leonard JApr 125	Palmer, Robert
	Brenner, Bert	Hutton, Daniel B Feb 127	Paterson, Sydney Gordon Mar 133 Paul, Charles Eugene Apr 125
	Bridgwater, Malcom M Dec 95 Brown, J. Stanley Mar 133	I	Peiler, Karl ErnestMay 117
	Burlingame, Robert Elmore Jan 125 Button, Harry W Jan 125	Iglehart, Marion McDonnal May 117 Ingham, Paul W Mar 133	Perrin, Lloyd AJan 125 Peters, John FindlayFeb 127
,	•	1	Peterson, James R
	С	J	Pfestorf, Gerhard Kurt Martin Mar 133 Pike, Donald Bascom Jan 125
	Cade, Andrew G May 117 Carrol, Douglas Greig Apr 125	Jackson, Wilson Anthony Mar 133 Jetter, Alfred Theodor Jan 125	Pittam, Thomas C Feb 127 Plowman, Ashley S Jan 125
	Champagne, Leo J	Joe, Roland Harold	Pohl, Richard FMar 133
	Chubbuck, Edward E Mar 133	Johnson, Richard Eric	R
	Clark, William Russell Dec 95 Clary, Hubert Leron Jan 125	Jolliffe, C. BNov 109	Reiger, Siegfried H Sep 117
	Costello, Robert J	K	Reilly, Vincent Edward
	Coup, Fred T Apr 125 Cowan, James Warner Jan 125	Kallevang, Edwin J Apr 125	Requa, Frederick Livingston Feb 127 Rice, John M. May 117
	Coyne, Russel D. Mar 133 Crookston, James Gordon Willock. Feb 127	Kaplan, Bernard	Richmond, Harold Bours Aug 125
	Crookston, James Gordon Willock Feb 127	Kenyon, Alonzo F	Riddle, C. L
	D	Kirsch Walter A Mar 133 Kniel, Wolfgang Eduard. Jun 117	Roetken, Alfred Allen Aug 125 Rogers, Billy B May 117
	Day, Edward C	Knoll, Max H. Feb 127 Koehler, Glenn Jun 117	Roots, William Kesteven Jan 125 Roulston, Kenneth L. Jan 125
	Deans, WilliamNov 109 Del'Homme, Laurence KoehlApr 124	Kohno, Shishu	Ruchlin, Walter H. Apr 125 Russ, John Albert May 117
	DeMerit, Merrill         May 117           Dennis, Robert E         Apr 124	Kohr, Robert H	Russell, Thomas JApr 125
	Dietze, Irwin C.         Jan 125           Dill, John, Jr.         Feb 127	Korli, William Don	S
	Dillard, Edward W. Jun 117 Doble, Frank Currier Mar 133	Kusner, Louis	Sander, Vernon AJan 125
	Dobson, George GordonJan 125	Ĺ	Scanlan, Richard John Mar 133 Schmalbach, Stewart May 117
	Dougherty, Harry Patrick, Jr Apr 125 Dow, Jennings B Jun 117	Lang, Gerald F Mar 133 Lanigan, Eugene David. May 117	Schneeberger, Grover B Jun 117 Scholz, Carl Eugene Apr 124
	Dralle, H. E	Lee, Yuk Yan	Schramm, Adolph P. C. Apr 125 Schramm, Richard E. Feb 127
	Dunlap, Orrin E., Jr	Legler, Rudolph L	Schulke, Albert Angelo MichaelApr 125
	•	Levin, Samuel AJan 125 Liepelt, Elmer ErwinApr 125	Schwerin, Paul Jun 117 Scop, Lev Jun 117
	E	Light, Philip H	Scott, Arnold Henry
	Egan, William E May 117 Eisenbach, Jerome. Jan 125	Lockner, John G May 117 Lomax, Sydney Evans. Apr 125	Segel, Henry Philip
	Eisenberg, Murray HApr 125	Lory, Marion RichardsNov 109	Shand, Errol Bertram. Apr 125 Shave, Larry N. Jun 117
ď	Eisencraft, Marcos. Apr 125 Eitman, Joseph Frederick. Mar 133	Loud, Francis Martin. Jun 117 Lovelady, Marcus H. Jul 113	Simonson, Gary M. Feb 127 Sinsel, Paul Whitesell Feb 127
	Elliott, Harold Farley Aug 125 Ellis, Carl Everett	Lowden, Virgil E	Siskind, Robert Peer
	Elmgren, William Lawrence	Ludovici, Bruno F Jan 125 Luft, Oliver Lesley Apr 125	Skove, Walter Jun 117 Slepian, Joseph Mar 132
	•	•	

Smith, Byers G
Smith, Willard Albert Feb 127
Smith, William DJan 125
Spencer, Percy LeBaronNov 109
Spencer, Stanley OscarFeb 127
Spurlock, Harold James Apr 125
Stearns, Fenton V
Steed, David WJan 125
Stephens, James CarlyleJun 117
Stermer, Herman GApr 125
Stevens, Frank JSep 117
Stinson, Ira FrankJan 125
Streuli, Werner RJan 125
Strobel, Henry Christian Feb 127
Suhr, Frederick WJan 125
Sutton, Louis Valvelle
Swenson, George WMar 132
Switzenberg, Elmer A. F Jun 117
~

Tappan, Frank GirardApr 124
Taylor, Robert Gibson Feb 127
Temple, Kirk I
Teore, Kenneth
Terada, MasazumiJan 125
Thompson, Howard A Apr 125
Thornberry, Paul E Feb 127
Thurman, James Lynn
Travers, Fred Hartt
Troup, Everett O Feb 127

### U

Upton, Arthur.....

V	
Van Emden, Aaron LMar	
Vargo, Joseph WilliamFeb	127
Vassy, Etienne J	133
Veerkamp, Norbert BApr	

	***
Waddington, Charles VSep 117	Wi
Wagner, Charles F	Wo Wo
Walach, John GeorgeApr 125	Wo
Walters, Ernest G May 117	W
Walton, Percy James	
Ward, Luther Hawes Apr 125	
Watt, George YoungFeb 127	
Weidler, Richard	
Weiland, William A Feb 127	Yo
Wellborn, Ray, JrFeb 127	
Wenger, Wiley DonaldApr 125	
West, James O Mar 133	
West, Michael N May 117	
Wilder, Victor Edwin Feb 127	7
Willcox, Thomas NormanMar 133	Za

Willey, Frank William Nov 109 Wintner, Louis Apr 125 Wise, Harold Gorden Jan 125
Woodward, Chester PJan 125
Woolfson, Monroe GApr 125
Worcester, Willis GeorgeApr 125
Υ
Young, Dana AJan 125

. oung,	200000		•	*	•	•	 •		٠	•		-		

### Ζ

Zane.	Ralph	R							,		,	. Jan	125	

### Index to advertisers

Amboss, Kurt	Du Pont Company
Armco Steel Corp	Dyko Enterprises
Bussmann Mfg. Div., McGraw-Edison Co. 55 Henderson Advertising Co.	Eastman Kodak Company 9 Rumrill-Hoyt, Inc.
Circuit-Stik, Inc	Fluke Mfg. Co., Inc., John
Consolidated Reactive Metals, Inc 8 Marc Dorian, Inc.	Gamma Electronics Co 111
Consulting Communications Engineers, Inc 111	General Cable Corporation
Digital Equipment Corp	General Dynamics56-57 Young & Rubicam, Inc.

# High Voltage **Engineer**

## **Utility Wire and Cable**

To help us in developing new high\_voltage products and production processes, the Electrical Utilities Dept of General Cable's Research Center at Bayonne. N J . needs a high voltage engineer with a BSEE or BS in physics, and at least 5 years experience working with high voltage equipment. You should know HV materials research, testing and manufacturing techniques. The position also requires familiarity with related electrical and electronic equipment, and a sound background in mathematics You'll have the back-up of one of the most advanced HV cable research facilities in the industry. The work includes investigating insulation and semi-conducting materials analyzing processing conditions as they affect cable performance—and designing new types of HV cable and equipment

This is an outstanding opportunity to apply your HV capability—and extend your professional scope in the field—with a world leader in wire and cable research and production. Please send your resume to Mr. Joseph Keinberger, General Cable Corporation. 730 Third Avenue New York N Y 10017



An Equal Opportunity Employer MIF

### **ELECTRONICS TECHNICIAN**

We are seeking an electronics technician with 3 to 5 years' experience in installation and maintenance of electronic and electrical equipment for our Lemont, Illinois district. Equipment includes supervisory controls, automated pumping stations and telemetry required to operate an automated LP Gas pipe line. We are an expanding company with excellent employee benefits and growth opportunity. Send resume in confidence to

William R. Leader

### HYDROCARBON TRANSPORTATION, INC.

2223 Dodge St., Omaha, Nebraska 68102

An Equal Opportunity Employer