

Recent Papers by IBM Authors

Reprints of the papers listed here may usually be obtained most efficiently by writing directly to the authors. The authors' IBM divisions and locations are identified as follows: ASDD is the Advanced Systems Development Division; CD, Components Division; DPD, Data Processing Division; FSD, Federal Systems Division; RES, Research Division; SDD, Systems Development Division and SMD, Systems Manufacturing Division. East Fishkill, Endicott, Kingston, Owego, Poughkeepsie, and Yorktown Heights are in New York; Los Gatos, Palo Alto, and San Jose, California; Gaithersburg, Maryland; Rochester, Minnesota; Huntsville, Alabama; Burlington, Vermont; and Boeblingen, Germany.

● Journals

The Decomposition of an Anisotropic Elastic Tensor, Part II. Y. O. Tu (RES Yorktown Hts.), *Acta Crystallographica A* **24**, 273-282 (March, 1968).

Dependence of Radiative Efficiency in GaP Diodes, A. Onton and M. R. Lorenz (RES Yorktown Hts.), *Applied Physics Letters* **12**, No. 4, 115-117 (February, 1968).

Time-Resolved Stimulated Emission Spectra of an Organic Dye Laser, G. I. Farmer, G. B. Huth, L. M. Taylor and M. R. Kagen (FSD Gaithersburg), *Applied Physics Letters* **12**, No. 4, 136-138 (February 15, 1968).

The Epitaxy of Copper on Sapphire, G. Katz (RES Yorktown Hts.), *Applied Physics Letters* **12**, No. 5, 161-163 (March, 1968).

Resistance Monitoring and Effects of Nonadhesion During Electromigration in Aluminum Films, R. Rosenberg and L. Berenbaum (RES Yorktown Hts.), *Applied Physics Letters* **12**, No. 5, 201-204 (March, 1968).

Aging of Solder Standards, G. H. Glade and H. R. Post (CD Burlington), *Applied Spectroscopy* **22**, No. 2, 123 (March/April, 1968).

A One-Map Method Flip-Flop Input, M. P. Marcus (SDD Endicott), *Computer Design* **8**, No. 3, 54-58 (March, 1968).

Computer Technology in Communist China, P. R. Nyberg (SDD Endicott), *Datamation* **14**, No. 2, 39-43 (February, 1968).

Single Cam Sequences Three Followers in High-Speed Card Punch, D. W. Hegeman and J. E. Lisinski (SDD Rochester), *Design News* **23**, No. 2, 58-59 (January 19, 1968).

Philosophie und Programmierung, H. Zemanek (SDD Vienna), *E und M* **84**, No. 10, 413-421 (1967).

Stress Effects in Masking Films on Silicon, J. M. Fairfield, J. K. Howard and G. H. Schwuttke (CD E. Fishkill), *Electrochemical Technology* **6**, No. 3-4, 110-113 (March-April, 1968).

Silicon Planar Chemical Polishing, J. Regh (CD E. Fishkill) and G. A. Silvey (CD E. Fishkill—deceased), *Electrochemical Technology* **6**, No. 3-4, 155-158 (March-April, 1968).

Low-Cost Components Form a Square-Wave Generator, C. D. Brower (SDD Rochester), *Electronic Design* **16**, No. 4, 120-121 (February 15, 1968).

Increase Connector Contact Reliability, M. Ball, F. Hardie and E. Struckus (FSD Owego), *Electronic Engineer* **27**, No. 3, 82-85 (March, 1968).

Universal Maps Yield Sequential Counter Logic, M. P. Marcus (SDD Endicott), *Electro-Technology* **81**, No. 2, 75-76 (February, 1968).

Adding Offset to Test-signal Sources, P. E. Stuckert (RES Yorktown Hts.), *Electro-Technology* **81**, No. 3, 93-94 (March, 1968).

Gedanken zu einem 8-bit-Code (Thoughts about an 8-bit code), H. Zemanek (SDD Vienna), *Elektronische Rechenanlagen* **9**, No. 2, 65-67 (1967).

Geschichte des Automaten—18 Jahrhundert: Der dritte Schreiber von Friedrich von Knaus (The history of automation—18th century: The third clerk of Friedrich von Knaus), H. Zemanek (SDD Vienna), *Elektronische Rechenanlagen* **9**, No. 3, 107-108 (1967).

An Analysis of Metal Fatigue Based on Hysteresis Energy, C. S. Chang, W. T. Pimbley (SDD Endicott) and H. D. Conway (Cornell U.), *Experimental Mechanics* **8**, No. 3, 133-137 (March, 1968).

Die Programmierung und ihre Sprachen, (Programming and its languages), H. Zemanek (SDD Vienna), *IBM Nachrichten* **14**, No. 182, 439-445 (April, 1967).

Structural Aspects of the System/360 Model 85, Part I. General Organization, C. J. Conti, D. H. Gibson and S. H. Pitkowsky (SDD Poughkeepsie), *IBM Systems Journal* **7**, No. 1, 2-14 (1968).

Structural Aspects of the System/360 Model 85, Part II. The Cache, J. S. Liptay (SDD Poughkeepsie), *IBM Systems Journal* **7**, No. 1, 15-21 (1968).

Structural Aspects of the System/360 Model 85, Part III. Extension to Floating-Point Architecture, A. Padegs (SDD Poughkeepsie), *IBM Systems Journal* **7**, No. 1, 22-29 (1968).

An Economic Lot-Sizing Technique, Part I. The Part-Period Algorithm, J. J. DeMatteis (ASDD Yorktown Hts.), *IBM Systems Journal* **7**, No. 1, 30-38 (1968).

An Economic Lot-Sizing Technique, Part II. Mathematical Analysis of the Part-Period Algorithm, A. G. Mendez (WTC Montreal), *IBM Systems Journal* **7**, No. 1, 39-46 (1968).

A Multi-Item Economic Lot-Sizing Problem, J. F. Pierce (MIT), *IBM Systems Journal* **7**, No. 1, 47-66 (1968).

Measurement of the Relaxation Time of the Eastman 9740 Bleachable Dye, J. W. Shelton (RES Yorktown Hts.) and J. A. Armstrong (RES Zurich), *IEEE Journal of Quantum Electronics* **QE-3**, No. 12, 696-697 (December, 1967).

Large-Scale Integration of MOS Complex Logic: A Layout Method, A. Weinberger (SDD Poughkeepsie), *IEEE Journal of Solid-State Circuits* **SC-2**, No. 4 (December, 1967).

Experimental Optical Links, B. R. Shah (SDD Poughkeepsie), *IEEE Transactions on Communication Technology* **COM-15**, No. 6, 870-871 (December, 1967).

Performance Evaluation of Computing Systems with Memory Hierarchies, W. Anacker and C. P. Wang (RES Yorktown Hts.), *IEEE Transactions on Electronic Computers* **EC-16**, No. 6, 764-773 (December, 1967).

An Experimental Investigation of a Nonsupervised Adaptive Algorithm, E. R. Ide and C. J. Tunis (SDD Endicott), *IEEE Transactions on Electronic Computers* **EC-16**, No. 6, 860-864 (December, 1967).

Very High-Speed Cross-Sectional Model for a 147-k bit Thin Magnetic Film Memory in the NDRO Mode, W. Jutzi (RES Zurich), *IEEE Transactions on Magnetism* **MAG-3**, No. 4, 640-646 (1967).

Use of the Digital Signal Averager for Delta Noise Measurements (Letter), W. M. Chu (SDD Poughkeepsie), *IEEE Transactions on Magnetism* **3**, No. 4, 705-706 (December, 1967).

Decision Making in Markov Chains Applied to the Problem of Pattern Recognition, J. Raviv (RES Yorktown Hts.), *IEEE Transactions on Information Theory* **IT-13**, No. 4, 536-551 (October, 1967).

Multilayer Processing for Magnetic Film Memory Devices, B. I. Bertelsen (CD Burlington), *IEEE Transactions on Magnetism* **MAG-3**, No. 4, 635-640 (December, 1967).

Automata in General Algebras, S. Eilenberg and J. B. Wright (RES Yorktown Hts.), *Information and Control* **11**, No. 4, 452-470 (October, 1967).

Variational Methods in the Computation, P. M. Marcus (RES Yorktown Hts.), *International Journal of Quantum Chemistry* **1s**, pp. 567-588 (1967).

Transverse Kerr Magneto-Optical Effect in EuO Films, J. C. Suits and K. Y. Ahn (RES Yorktown Hts.), *Journal of Applied Physics* **39**, No. 2, 570 (February, 1968).

Studies of Curie-point Increases in EuO, M. W. Shafer and T. R. McGuire (RES Yorktown Hts.), *Journal of Applied Physics* **39**, No. 2, 588-590 (February, 1968).

Magnetization of Some Single-Crystal Alloys of Rare Earth Metals, R. M. Bozorth, R. J. Gambino (RES Yorktown Hts.) and A. E. Clark (RES New York City), *Journal of Applied Physics* **39**, No. 2, 883-885 (February, 1968).

Resistivity Anomaly in Conducting Europium Chalcogenides, S. von Molnar and S. Methfessel (RES Yorktown Hts.), *Journal of Applied Physics* **39**, No. 2, 899 (February, 1968).

Multiplet Structure in the Absorption Spectrum of Eu²⁺, M. J. Freiser, S. Methfessel and F. Holtzberg (RES Yorktown Hts.), *Journal of Applied Physics* **39**, No. 2, 900-902 (February, 1968).

Magnetic Properties of Hexagonal RbNiF₃ with Substituted Ions, T. R. McGuire and M. W. Shafer (RES Yorktown Hts.), *Journal of Applied Physics* **39**, No. 2, 1130-1131 (February, 1968).

Low-temperature Beam-addressable Memory, G. Y. Fan and J. H. Greiner (RES Yorktown Hts.), *Journal of Applied Physics* **39**, No. 2, 1216-1218 (February, 1968).

A Coupled Magnetic Film Device for Associative Memories, C. P. Wang (RES Yorktown Hts.), *Journal of Applied Physics* **39**, No. 2, 1220-1221 (February, 1968).

Magnetization Reversal in Multilayer Film-Device Structures, H. Chang, E. R. Genovese (RES Yorktown Hts.) and B. L. Flur (SDD Hursley), *Journal of Applied Physics* **39**, No. 2, 1222-1224 (February, 1968).

Magnetoelastic Resonance in Ferrite Cores, E. L. Boyd (SDD Poughkeepsie), *Journal of Applied Physics* **39**, No. 2, 1304-1308 (February, 1968).

Conductance Extrema in Metal-insulator-semiconductor Tunnel Junctions, L. L. Chang (RES Yorktown Hts.), *Journal of Applied Physics* **39**, No. 3, 1455-1457 (February, 1968).

Pressure Dependence of Barrier Heights in Ge-GaAs n-n Heterojunctions, W. E. Howard, A. B. Fowler (RES Yorktown Hts.) and D. McLeod (Harvard), *Journal of Applied Physics* **39**, No. 3, 1533-1540 (February, 1968).

Electroluminescence from Ge-doped GaP p-n Junctions, K. K. Shih, G. D. Pettit and M. R. Lorenz (RES Yorktown Hts.), *Journal of Applied Physics* **39**, No. 3, 1557-1560 (February, 1968).

X-ray Stress Topography of Thin Films on Germanium and Silicon, G. H. Schwuttke and J. K. Howard (CD E. Fishkill), *Journal of Applied Physics* **39**, No. 3, 1581-1591 (February 15, 1968).

International Standards for Audio, W. W. Lang (SDD Poughkeepsie), *Journal of the Audio Engineering Society* **16**, No. 2, 174-181 (April, 1968).

Communications-based MIS, E. Murphy (SDD San Jose), *Journal of Data Management* **6**, No. 2, 20-25 (February, 1968).

Growth of Large Single Crystals of Gallium Phosphide from a Stoichiometric Melt, S. E. Blum and R. J. Chicotka (RES Yorktown Hts.), *Journal of the Electrochemical Society* **115**, No. 3, 298-300 (March, 1968).

Justification of the Continuation Method in Two-Point Boundary Value Problems, S. Roberts and J. S. Shipman (FSD Houston), *Journal of Mathematical Analysis and Application* **21**, No. 1, 23-30 (January, 1968).

Profit Functions and Optimal Control: An Alternate Description of the Control Problem, D. Chazan (RES Yorktown Hts.), *Journal of Mathematical Analysis and Application* **21**, No. 1, 169-206 (January, 1968). Research supported by the National Aeronautics and Space Administration under grant Ns G-354, Supplement 2. Work performed while the author was at the U. of Cal., Berkeley and constitutes the bulk of a work submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in electrical engineering.

Superconductivity of Lanthanum Intermetallic Compounds with the Cu₃Au Structures, R. J. Gambino, N. R. Stemple and A. M. Toxen (RES Yorktown Hts.), *Journal of Physics and Chemistry of Solids* **29**, No. 2, 295-302 (February, 1968).

Magnetic Moment of EuSe, T. R. McGuire, F. Holtzberg (RES Yorktown Hts.) and R. J. Joenk (CHQ Armonk), *Journal of Physics and Chemistry of Solids* **29**, No. 2, 410-413 (February, 1968).

Toward Automating the Medical History, J. G. Mayne (Mayo Clinic), W. Weksel (Weksel Associates) and P. N. Sholtz (ASDD Rochester), *Mayo Clinic Proceedings* **43**, No. 1, 1-25 (January, 1968).

Der österreichische Beitrag zur Entwicklung der Rechenmaschinen (Austrian contribution to the development of computing machines), H. Zemanek (SDD Vienna), *Osterr. Hochschulzeitung* **19**, No. 8, 23-25 (1967).

Ultrasonic Attenuation in the Heisenberg Paramagnet, II. Antiferromagnets, E. Pytte (RES Zurich) and H. S. Bennett (National Bureau of Standards, Washington, D. C.), *Physical Review* **164**, No. 2, 712-715 (December 10, 1967).

Optical Properties of Cd-O and Zn-O Complexes in GaP, T. N. Morgan, B. Welber and R. N. Bhargava (RES Yorktown Hts.), *Physical Review* **166**, No. 3, 751-753 (February, 1968).

The Optical and Electron Spin Resonance Spectra of Yb³⁺, Nd³⁺ and Cr³⁺ in LiNbO₃ and LiTaO₃, G. Burns, D. F. O'Kane and R. S. Title (RES Yorktown Hts.), *Physical Review* **167**, No. 2, 314-319 (March, 1968).

Infrared Dielectric Dispersion and Apparent Ionic Charges in Sodium Nitrite, J. D. Axe (RES Yorktown Hts.), *Physical Review* **167**, No. 2, 573-582 (March, 1968).

Phonon-assisted Tunneling in Bismuth Tunnel Junctions, L. Esaki, L. L. Chang, P. J. Stiles, D. F. O'Kane and N. Wisser (RES Yorktown Hts.), *Physical Review* **167**, No. 3, 637-639 (March, 1968).

Theory of Avalanche Breakdown in InSb and InAs, W. P. Dumke (RES Yorktown Hts.), *Physical Review* **167**, No. 3, 783-789 (March, 1968).

Calculation of Ion Bombarding Energy and its Distribution in rf Sputtering, R. T. C. Tsui (RES Yorktown Hts.), *Physical Review* **168**, No. 1, 107-113 (April, 1968).

Stark Effect in the Excited States of Rb, Cs, Cd and Hg, A. Khadjavi, A. Lurio (RES, New York City) and W. Happer (Columbia U., N. Y.), *Physical Review* **168**, No. 1, 128-135 (March, 1968). A. K. is now at Westinghouse Research Labs, Pittsburgh, Pa. Work supported in part by the joint services electronics program (U. S. Army, U. S. Air Force, and U. S. Navy) under contract DA-28-Q43 AMC-00099 (E).

Calculation of the Superconducting Transition Temperature, P. E. Seiden (RES Yorktown Hts.), *Physical Review* **168**, No. 2, 403-407 (April, 1968).

Superconductivity in the Lanthanum Selenide System, F. Holtzberg, P. E. Seiden and S. von Molnar (RES Yorktown Hts.), *Physical Review* **168**, No. 2, 408-412 (April, 1968).

Optical Probing of Magnetoelastic Waves, A. W. Smith (RES Yorktown Hts.), *Physical Review Letters* **20**, No. 7, 334-337 (February 12, 1968).

Magnetic Equation of State and Specific Heat of EuS Near the Curie Point, B. J. C. van der Hoeven, Jr., D. T. Teaney and V. L. Moruzzi (RES Yorktown Hts.), *Physical Review Letters* **20**, No. 14, 719-722 (April, 1968).

Singular Behavior of a Ferromagnet in Nonzero Field, D. T. Teaney, B. J. C. van der Hoeven, Jr. and V. L. Moruzzi (RES Yorktown Hts.), *Physical Review Letters* **20**, No. 14, 722-724 (April, 1968).

Recombination Time of Quasiparticles in Superconducting Aluminum, J. L. Levine and S. Y. Hsieh (RES New York City), *Physical Review Letters* **20**, No. 18, 994-997 (April, 1968).

Molecular Field Theory, the Onsager Reaction Field and the Spherical Model, R. Brout (Université Libre de Bruxelles) and H. Thomas (RES Zurich), *Physics* **3**, No. 6, 317-329 (1967).

Techniques for the Optimal Design and Synthesis of Switching Circuits, G. D. Hachtel and R. A. Rohrer (RES Yorktown Hts.), *Proceedings of the IEEE* **55**, No. 11, 1864-1877 (November, 1967).

Uniform Distributed Amplifier Analysis with Fast and Slow Waves, W. Jutzi (RES Zurich), *Proceedings of the IEEE* **56**, No. 1, 66-67 (January, 1968).

Short Run Casting to Test Part Design, C. E. Olsen (SMD Rochester), *Production* **61**, No. 3, 146-149 (March, 1968).

Vacuum Heat Treatment Optimizes Magnetic Properties, G. Koves (SDD Rochester), *Research/Development* **19**, No. 3, 52-55 (March, 1968).

Photographic Apparatus for the Study of Fracture in Metals, H. Ezrol (CD E. Fishkill), H. Margolin, R. W. King (Potter Instruments, Plainview, L. I., N. Y.) R. Bunshah (Lawrence Radiation Laboratories, U. of Cal., Livermore) and P. Venkatesan (Western Electric Engineering Research Center, Princeton, N. J.), *Review of Scientific Instruments* **39**, No. 2, 229-232 (February, 1968).

Theory of the Parallel Thermocouple, A. D. Wilson and H. B. Ulsh (SDD Endicott), *Review of Scientific Instruments* **39**, No. 3, 346-348 (March, 1968).

Visible Light from Semiconductors, M. R. Lorenz (RES Yorktown Hts.), *Science* **159**, No. 3822, 1419-1423 (March, 1968).

Large Scale Integration, H. Freitag and S. Triebwasser (RES Yorktown Hts.), *Science and Technology*, No. 70, 62-70 (October, 1967).

Ion Etch Technique and its Applications, R. T. C. Tsui (RES Yorktown Hts.), *Semiconductor Products and Solid State Technology* **10**, No. 12, 33-38 (December, 1967).

Hysteresis in the Superconducting Transition of Single Spheres of Indium, J. Feder (Fysisk Institutt, Universitetet, Oslo) and D. S. McLachlan (RES Zurich), *Solid State Communications* **6**, No. 1, 23-26 (1968). D. S. M. is now at the U. of the Witwatersrand, Johannesburg.

On the Possibility of Observing Electron-Phonon Umklapp-Processes in Photoconductive Spectral Response of Semiconductors, H. J. Stocker (RES Zurich), *Solid State Communications* **6**, No. 2, 125-128 (1968).

Green's Functions Method in Lattice Dynamics, P. C. K. Kwok (RES Yorktown Hts.), *Solid State Physics* **20**, 214-305 (1967).

Electronic Effects in the Elastic Properties of Semiconductors R. W. Keyes (RES Yorktown Hts.), *Solid State Physics* **20**, 37-91 (1968).

Comments on "Multiple Scattering Versus Superstructures in Low Energy Electron Diffraction," by E. Bauer, F. Jona, R. F. Lever and J. B. Gunn (RES Yorktown Hts.), *Surface Science*, pp. 468-470 (September, 1967).

Multilead EDM Sparks Increased Productivity, M. R. Radio (SMD Rochester), *Tool and Manufacturing Engineer* **60**, No. 2, 20-22 (February, 1968).

Dynamics of Synchronous-precressing Turborotors with Particular Reference to Balancing, Part II. Applications, T. Tang (SDD San Jose) and T. Trumper (U. of Pa.), *Transactions of the ASME, Journal of Applied Mechanics* **35**, No. 1, 25-30 (March, 1968).

Comments on the Frictional Behavior Between a Print Character and a Carbon Ribbon, R. G. Bayer and J. L. Sirico (SDD Endicott), *Wear* **11**, No. 1, 78-83 (1968).

• *Conference proceedings*

Die Castings for the Computer Industry, C. E. Olsen (SMD Rochester), *Preprints of papers, ASTM Casting, Molding, and Metallurgical Processing Seminar*, No. CM68, p. 595 (March 27, 1968).

Computers Applied to Routings, J. D. Mueller (SMD Rochester), *Preprints of papers, ASTM Manufacturing Systems Seminar*, No. MS68, p. 574 (March 6, 1968).

Survey of Telemetry-standard Systems, R. F. Filipowsky (FSD Huntsville), *Record of the Educational Seminar Session at the National Telemetering Conferences*, pp. 1-10 (April 8, 1968).

The Utility of Coded Communications Systems, R. F. Filipowsky (FSD Huntsville), *Proceedings of the Fifth Space Congress* **1**, 5.4.1-5.4.17 (March 11-14, 1968).

Small-Card Wiring Changes on a Graphic Console, J. M. Lafuente and S. C. Plumb (SDD Poughkeepsie), *IEEE International Convention Digest*, p. 51 (1968).

High Energy Nitrogen Doping of Single Crystal Silicon, G. H. Schwuttke (CD E. Fishkill), K. Brack (SDD Boeblingen), E. E. Gardner (CD E. Fishkill) and H. DeAngelis (AFCRL), *Proceedings of the 1967 Santa Fe Conference on Radiation Effects in Semiconductors*, pp. 406-417 (March, 1968).

Jahn-Teller Effects in Magnetic Resonance, K. A. Müller (RES Zurich), *Proceedings of the XIVth Colloque Ampère on Magnetic Resonance and Relaxation*, pp. 192-208 (1967).

VE—a Working Tool of Industry, M. A. Johnson and L. E. Sheldon (SDD San Jose), *SAVE Proceedings*, pp. 84-89 (February 15, 1968).

Fundamental Characteristics of Trigonometric Product Waveforms, R. F. Filipowsky (FSD Huntsville), *IEEE National Telemetry Conference Record*, pp. 103-113 (April, 1968).

Architectural Concepts for Data Acquisition Stored Program Processors, J. R. Owen III (FSD Huntsville), *IEEE National Telemetry Conference Record*, pp. 221-225 (April, 1968).

Programming and Graphics Support for Infrared Thermal Plotters, A. D. Levit (SDD Poughkeepsie), *Proceedings of the 1967 UAIDE Annual Meeting*, pp. 282-305 (January, 1968).

Computerized System of Failure Analysis Reporting, J. A. Ferrante (SMD Rochester), *Preprints of Conference Papers, WESTEC*, No. MS68, P. 723 (March 13, 1968).