Contributors

Bertrand E. Berson received the B.E.E. degree from the City College of New York, New York, N. Y., in 1960 and the M.S. degree from the College of Engineering, the University of Rochester, Rochester, N. Y. in 1963. He has had additional schooling at the University of Rochester, UCLA Extension, Mount San Antonio Junior College, and the Newark College of Engineering.

From 1962 to 1966 he was a Senior Physicist with General Dynamics, Pomona, Calif., where he was involved in research in the areas of thin films and thin-film microelectronics, organic semiconductors, and plasma oscillations in indium antimonide. Since joining the Advanced Technology Laboratory, RCA, Princeton, N. J., he has been engaged in work on silicon and gallium arsenide microwave devices. He is currently leader of a group pursuing research on bulk-effect microwave oscillators.

In 1968 Mr. Berson received an RCA Laboratories Achievement Award for his research on transferred electron oscillators. He is a member of the American Physical Society.

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Berthold G. Bosch (M'64–SM'67) was born in Bonn, Germany, on May 30, 1930. He received the Dipl.-Ing. degree in electrical engineering from the Aachen Technical University, Aachen, Germany, in 1955, the Ph.D. degree from Southampton University, Southampton, England, in 1960, and the Venia Legendi from Karlsruhe University, Karlsruhe, Germany, in 1969.

From 1956 to 1959 he was a Research Assistant in the Department of Electronics, Southampton University, working primarily on noise in active microwave devices. In 1960 he joined the Microwave Tube Division, Telefunken AG (now AEG-Telefunken), Ulm, Germany. There he carried out developmental and research work on low-noise microwave tubes. In 1963 he transferred to the Ulm Research Institute of the same company and is now in charge of the Microwave Laboratory where the main activities are in the field of microwave solid-state electronics. Since 1969 he has been an Adjunct Staff Member (Privat-Dozent) of the Faculty of Electrical Engineering, University of Karlsruhe, Germany, lecturing on topics in electronics.

Dr. Bosch has received the A. F. Bulgin Prize of the British IRE in 1961 and the prize of the Nachrichtentechnische Gesellschaft (NTG) in 1969. He is a member of NTG.

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Harold C. Bowers (M'66) was born in Scranton, Pa., on November 21, 1939. He received the S.B. degree in physics from the Massachusetts Institute of Technology, Cambridge, in 1961 and the M.S. and Ph.D. degrees in applied physics from Cornell University, Ithaca, N. Y., in 1964 and 1966, respectively.

He joined the General Electric Company in 1961 to work on semiconductor devices at the Advanced Electronics Center, Ithaca, N. Y. In 1966 he transferred to General Electric's Electronics Laboratory in Syracuse, N. Y., where he was engaged in quantum electronics and solid-state device research and development. Since June, 1969, he has been working on microwave solid-state devices and circuits at Hughes Aircraft Company's Electron Dynamics Division, Torrance, Calif., where he is a Senior Staff Engineer.

Dr. Bowers is a member of the American Physical Society and of Phi Kappa Phi.

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D. Cawsey, photograph and biography not available at the time of publication.

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Kern K. N. Chang was born in Shanghai, China, on September 15, 1919. He received the B.S. degree from National Central University, Chungking-Nanking, China, in 1940, the M.S. degree in electrical engineering from the University of Michigan, Ann Arbor, in 1948, and the Ph.D. degree from the Polytechnic Institute of Brooklyn, Brooklyn, N. Y., in 1954.

From 1940 to 1945 he was associated with the Central Radio Manufacturing Works, Kumming, China, working on radio receivers, and from 1945 to 1947 he was a radio instructor in the Office of Strategic Services, U.S. Army, China Theater. Since 1948 he has been a member of the technical staff at RCA Laboratories, Princeton, N. J. He has been engaged in research on magnetrons, traveling-wave tubes, beam-focusing devices, parametric amplifiers, and tunnel-diode devices. In 1953 he did original work on periodic field focusing for traveling-wave tubes, which has culminated in an RCA commercial line of TWTs. In 1957 he was one of the pioneers who explored the principle of parametric amplification and harmonic generation. In 1958, he was first to realize a low-noise tunnel-diode amplifier and converter. He is presently head of the Solid-State Microwave Devices at RCA Laboratories, Princeton, N. J.; his field of interest is in superconducting semiconductor amplifiers and oscillators. Dr. Chang is the author of 40 original technical papers and holds 30 patents in the field of microwave tubes and solid-state devices. He is the author of the book *Parametric and Tunnel Diodes*, (Prentice-Hall). He was the recipient of the 1956 and 1960 RCA Achievement Awards for outstanding theoretical and experimental research on electron-beam focusing and on parametric and tunnel-diode devices. He was also the 1964 achievement-award winner of the Chinese Institute of Engineers, Inc., New York, N. Y., for his outstanding contribution in the field of electron devices. In 1967, he received one of the most distinguished awards that RCA bestows on an individual employee: the David Sarnoff Outstanding Achievement Award in Science. In the same year he was appointed a Fellow of the RCA Laboratories.

Dr. Chang is a member of Sigma Xi and has been selected for listing in the *American Men of Science.*

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David R. Conn (S'68) was born in Hamilton, Ontario, Canada, on July 6, 1935. He received the B.Sc. and M.Sc. degrees in electrical engineering and, in 1970, the Ph.D. degree from Queen's University, Kingston, Ontario, Canada.

He joined the Northern Electric Company in 1961 where he worked on the development of microwave solid-state devices. In 1964 he joined the Research Division of Microwave Associates, Burlington, Mass., where he designed solid-state microwave generators and filters. During the period from 1967 to 1970 he was a lecturer at Queen's University and a consulting engineer for Northern Electric Company. He is presently a guest scientist at the Institutet för mikrovågsteknik, Stockholm, Sweden.

David R. Decker (M'70) was born in Neptune, N. J. on August 11, 1939. He received the B.S. degree in physics from North Carolina State College, Raleigh, in 1961; the M.S. degree in physics and the Ph.D. degree in electrical engineering from Lehigh University, Bethlehem, Pa., in 1963 and 1970, respectively.

In 1961 he joined Bell Telephone Laboratories, Allentown, Pa., and since 1963 has been employed at Bell Laboratories, Reading, Pa. where he has been engaged in the design and development of several types of microwave diodes. He is currently doing research and development on microwave avalanche diodes for use as phase-locked oscillators.

Dr. Decker is a member of Phi Kappa Phi, the Electrochemical Society, and the American Association for the Advancement of Science.

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Charles N. Dunn (M'66) was born in Elk River, Minn., on October 25, 1936. He received the B.S., M.S.E.E., and Ph.D. degrees in electrical engineering from the University of Minnesota, Minneapolis, in 1958, 1960, and 1964, respectively.

In 1964 he joined Bell Telephone Laboratories, Reading, Pa., as a Member of the Technical Staff. Since then he has been engaged in developmental studies on backward and tunnel diodes for microwave transmission applications and is now working on microwave diodes for solid-state oscillator sources.

Dr. Dunn is a member of Eta Kappa Nu, Tau Beta Pi, the American Physical Society, and Sigma Xi.

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R. W. H. Engelmann was born in 1934 in Berlin, Germany. He studied physics at the Technical University of Munich, Munich, Germany, receiving the diploma degree in 1958 and the Dr.rer.nat. degree in 1961.

From 1958 to 1961 he was supervising advanced laboratory courses at the University of Munich at the same time that he was specializing in nuclear physics for his thesis work. In 1961 he moved to the United States and joined CBS Laboratories, Stamford, Conn., where he was engaged in research and development of low-power semiconductor devices, tunnel diodes in particular. From 1963 to 1966 he was employed by Hewlett-Packard Company, Palo Alto, Calif., working in the areas of injection electroluminescence and bulk-oscillation phenomena in semiconductors. After returning to West Germany, he joined the Research Institute of AEG-Telefunken, Ulm, in 1967, where he now leads a group engaged in microwave semiconductor research.

Dr. Engelmann is a member of the American Physical Society.

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Ronald E. Enstrom received the S.B., S.M., and Sc.D. degrees in metallurgy from the Massachusetts Institute of Technology, Cambridge, in 1957, 1962, and 1963, respectively.

He has had widely ranging materials experience. From 1957 to 1960 he worked at Union Carbide and Nuclear Metals, Inc., on materials for high-temperature oxidation resistance and nuclear fuel elements, respectively. At M.I.T. his doctoral thesis focused on the metallurgy and superconductivity of the three compounds in the Nb-Sn system, and at RCA Laboratories he was instrumental in making Nb_3Sn ribbon a practical high-field magnet material. He is currently with RCA Electronic Components, Princeton, N. J., and has worked more recently on the vapor-phase synthesis and characterization of GaAs and GaAs-GaP alloys for high-power rectifiers and solid-state microwave oscillators, and on the vapor growth of GaAs-InAs alloys for photocathode applications. In addition to three patents and numerous publications, his work on superconducting and semiconducting materials has led to several awards, including an RCA Laboratories Achievement Award in 1966 and a David Sarnoff Outstanding Achievement Award in 1967.

Dr. Enstrom is a member of Sigma Xi, AIME, the American Physical Society, and the Electrochemical Society.

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William J. Evans (S'64–M'68) was born in Windsor, Ontario, Canada, on July 5, 1938. He received the B.S. degree in science engineering and the M.S. and Ph.D. degrees in electrical engineering from the University of Michigan, Ann Arbor, in 1960, 1964, and 1968, respectively.

From 1960 to 1963 he was with the U. S. Air Force, Eglin AFB, Fla., where he was involved with the engineering evaluation of electronic countermeasures systems. From 1964 to 1966 he was associated with the Optical Radio Systems Laboratory, and from 1966 to 1968 with the Electron Physics Laboratory, both of the University of Michigan. In 1968 he joined the staff at Bell Telephone Laboratories, Murray Hill, N. J., where he is working on IMPATT diodes.

Dr. Evans is a member of Phi Kappa Phi, Sigma Xi, and Tau Beta Pi.

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Richard L. Frank was born in Reading, Pa., on February 4, 1929. He received the Associate Degree in engineering, from Pennsylvania State University, Allentown Extension, in 1955.

He joined Bell Telephone Laboratories, Murray Hill, N. J., in 1955 where he worked in the Cable Tube Group. Transferring in 1957 to Bell Telephone Laboratories in Reading, Pa., he has been engaged in the development of coaxial magnetrons and is currently in the Microwave Device Group responsible for the microwave testing of IMPATT diodes.

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Stanley J. Fray was born in Southampton, England, on June 13, 1925. He is a graduate of London University, London, England.

He joined the Royal Radar Establishment, Malvern, England in 1943 (then T.R.E.) and worked on low-frequency standards and on the properties of carbon resistors at frequencies up to 1 GHz. He later joined the Low-Temperature Group working on superconducting bolometers and cyclotron resonance experiments on semiconductors. He was responsible for the development of a semiconducting photoconductive detector for 100-μm wavelength and the associated far-infrared spectrometers, and he was later concerned with the infrared and Raman phonon spectra of semiconductors. Since 1969 he has been working on the problems of waveguide-mounted transferred electron oscillators. He is a Senior Experimental Officer with the Ministry of Technology.

W. Frey was born in Karlsruhe, Germany, on March 13, 1938. He received the Dipl.-Ing. and the Dr.-Ing. degrees in 1964 and 1968, respectively, both from Karlsruhe University, Karlsruhe, Germany.

From 1964 to 1968 he was a Research Assistant at the Institute for High-Frequency Techniques and High-Frequency Physics, Karlsruhe University, working on gain stability of parametric amplifiers. In 1968 he joined the Research Institute of AEG-Telefunken, Ulm, Germany, where he is now working on transferred-electron devices.

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Stephen E. Gibbs (M'69) was born in London, England, on May 27, 1943. He received the B.Sc. degree in physics from University College London, England, in 1965.

Since 1965 he has been at the Royal Radar Establishment, Malvern, England, engaged in research on transferred electron oscillators at millimeter wavelengths.

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Paul T. Greiling (S'60, M'70) was born in Cleveland, Ohio, on October 19, 1939. He received the B.S. degree in electrical engineering and a B.S. degree in mathematics in 1963 and the M.S.E. and Ph.D. degrees in 1964 and 1970, respectively, all from the University of Michigan, Ann Arbor, Mich.

While at the University of Michigan he worked in the area of microwave solid-state devices. He is presently an Assistant Professor in the Department of Electrical Engineering at Northeastern University, Boston, Mass.

Dr. Greiling is a member of Eta Kappa Nu, Tau Beta Pi, Phi Kappa Phi, and Sigma Xi.

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George I. Haddad (S'57, M'61, SM'66) was born in Aindara, Lebanon, on April 7, 1935. He received the B.S.E., M.S.E., and Ph.D. degrees in electrical engineering in 1956, 1958, and 1963, respectively from the University of Michigan Ann Arbor. Mich.

From 1957 to 1958 he was associated with the Engineering Research Institute of the University of Michigan, where he was engaged in research on electromagnetic accelerators. In 1958 he joined the Electron Physics Laboratory, where he has been engaged in research on masers, parametric amplifiers, detectors, electron-beam devices, and microwave solid-state devices. He held a University of Michigan Research Institute Fellowship for the academic year of 1958–59 and a sponsored research fellowship for the spring semester of 1959–1960. He served successively as Instructor, Assistant Professor, and Associate Professor in the Electrical Engineering Department from 1960 to 1969. He is presently a Professor and Director of the Electron Physics Laboratory.

Dr. Haddad received the 1970 Curtis W. McGraw Research Award of the American Society for Engineering Education for outstanding achievements by an engineering teacher. He is a member of Eta Kappa Nu, Sigma Xi, Phi Kappa Phi, the American Physical Society, and the American Society for Engineering Education.

Toyosaku Isobe (M'67) was born in Shiga, Japan, on July 12, 1917. He received the B.S.E.E. and Ph.D. degrees from Yokohama National University, Yokohama, Japan, and Kyoto University, Kyoto, Japan, in 1939 and 1957, respectively.

From 1946 to 1957 he was a Research Assistant with Kyoto University, where he worked with microwave electronics. He then joined Fujitsu Laboratories, Ltd., where he worked on TWT and microwave electronics and was Chief of this group. He is currently Chief of the Advanced Microwave Solid State Laboratory.

Dr. Isobe is a member of the Institute of Electronics and Communication Engineers of Japan and the Physical Society of Japan.

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Yukio Ito was born in Iwate, Japan, on March 30, 1934. He received the B.S. degree in electrical engineering from Waseda University, Tokyo, Japan, in 1956.

From 1956 to 1961 he was with the Radio Transmission Engineering Department, Fujitsu Ltd. In 1962, he joined the Radio Transmission Laboratory, Fujitsu Laboratories Ltd., Kawasaki, Japan, and is now a chief engineer of the Microwave Components and Circuits Section. From 1956 to the present, he has been engaged in the research and development of microwave components and circuits, e.g., ferrite devices (isolator, circulator, and switch), tunnel-diode and transistor amplifiers, frequency converters (receiving mixer and transmitting up-converter), Gunn- and avalanche-effect oscillators and amplifiers, filters, branching networks, and microwave integrated circuits.

Mr. Ito is a member of the Institute of Electronics and Communication Engineers of Japan.

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Peter J. Khan (M'61) was born in Bowral, Australia, on November 12, 1936. He received the B.S. degree in mathematics and physics in 1957 and the B.E. and Ph.D. degrees in 1959 and 1963, respectively, all from the University of Sydney, New South Wales, Australia.

From 1953 to 1959 he was a Cadet Engineer with the Weapons Research Establishment at Salisbury, South Australia, carrying out research and development work in electronic circuit design. After completion of his doctoral studies in parametric amplification, he came to the United States in 1963 as a Fulbright Postdoctoral Fellow. Since that time he has been at the University of Michigan, AnnArbor, where he was appointed Lecturer in 1965 and Assistant Professor in 1967. He is head of the Microwave Solid-State Circuits Group at the Cooley Electronics Laboratory, Ann Arbor, Mich., where his research interests include varactor circuits, solid-state oscillators, antenna tuning networks, and electromagnetic field analysis of microwave structures.

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Hidemitsu Komizo was born in Tokyo, Japan, on December 3, 1939. He received the B.S. degree in electrical engineering from the University of Electro-Communications, Japan, in 1962.

In 1962 he joined the Radio Transmission Laboratory, Fujitsu Laboratories Ltd., Kawasaki, Japan, and has been engaged in the research and development of microwave components and circuits, such as circular waveguide transmission circuits, filters, tunnel-

diode and transistor amplifiers, and frequency converters. He is currently working on Gunn- and avalanche-diode oscillators and amplifiers, and integrated circuits.

Mr. Komizo is a member of the Institute of Electronics and Communication Engineers of Japan.

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Hidetoshi Kondo was born in Yamanashi, Japan on December 21, 1943. He received the B.S. and M.S. degrees in electronics engineering from Nagoya Institute of Technology, Nagoya, Japan, in 1966 and 1968, respectively.

In 1968 he joined the Nippon Electric Company, Ltd., Kawasaki, Japan, where he is now a Research Engineer in the Electron Device Laboratory, Central Research Laboratories. He has been engaged in research on microwave solid-state devices.

Mr. Kondo is a Member of the Institute of Electronics and Communication Engineers of Japan.

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Walter H. Ku (S'56–M'62) was born in Peiping, China, on September 9, 1935. He received the B.S. degree (with Honors) from the Moore School of Electrical Engineering, the University of Pennsylvania, Philadelphia, in 1957, and the M.S. and Ph.D. degrees from the Polytechnic Institute of Brooklyn, Brooklyn, New York, in 1958 and 1962, respectively, all in electrical engineering.

From 1957 to 1960 he was a Research Fellow at the Polytechnic Institute of Brooklyn. In 1960 he became a Senior Graduate Assistant at the Microwave Research Institute of the Polytechnic Institute, where he was associated with its network theory group. He spent the summers of 1956 and 1958 with IBM Corporation, Endicott, N. Y., and Vitro Electronics Company, Silver Spring, Md., respectively. From 1962 to 1969, he was associated with the Applied Research Laboratory of Sylvania Electronic Systems, Waltham, Mass., where he held the position of Senior Scientist. During this period, he was also a lecturer in the Graduate School of Northeastern University, Boston, Mass. In 1969 he joined the faculty of the School of Electrical Engineering of Cornell University, Ithaca, N. Y., where he is presently an Associate Professor of Electrical Engineering. His field of interest is circuit and system theory with emphasis on network synthesis, stability, and microwave solid-state devices.

Dr. Ku is a member of Sigma Xi, Sigma Tau, Eta Kappa Nu, and Tau Beta Pi.

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Lee A. MacKenzie (M'68) received the B.E.E., M.S., and Ph.D. degrees from Cornell University, Ithaca, N. Y., in 1957, 1959, and 1961, respectively.

After almost a year as a Senior Engineer with Varian Associates, he joined the Cornell faculty as Assistant Professor of Electrical Engineering and advanced to Associate Professor in 1965. In 1969 he left Cornell University to pursue independent consulting. He has published items in microwave electronics research over the past decade and has supervised graduate thesis work at the M.S. and Ph.D. levels.

Dr. MacKenzie is a member of Eta Kappa Nu, Tau Beta Pi, Sigma Xi, and Phi Kappa Phi.

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Richard E. Marx graduated from the Arts High School of Newark, N. J., in 1950. He attended Rutgers University, New Brunswick, N. J., Fairleigh Dickinson University, Rutherford, N. J., and the West Coast University of California. He received a total of 150 credits toward the B.S.E.E. degree.

From 1958 to 1959 he was with Allen B. DuMont Laboratories, Clifton, N. J., working on the development of the Lawrence color tube. He joined the Microwave Tube Operation, RCA, Harrison, N. J. in 1959 as a Microwave Engineering Technician working with microwave tubes (magnetron, TWTs, pencil tubes, and tunnel-diode oscillators). He transferred to the West Coast Microwave Engineering Operation, RCA, Los Angeles, Calif., where he worked on solid-state microwave devices used in such projects as GLOTRAC and LEM. In 1964 he returned to the Microwave Tube Operation, RCA, Harrison, N. J., to continue work on the LEM project. He joined the Microwave Applied Research Laboratory at the David Sarnoff Research Center, RCA Laboratories, Princeton, N. J., where he has worked on frequency multipliers and oscillators for the Maxson project. He was promoted to Technical Staff Associate in 1968 and is currently working on the application of GaAs material in transferred-electron oscillators and amplifiers. He has coauthored many technical publications in the microwave field.

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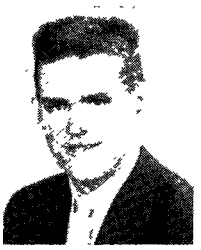

Thomas A. Midford (M'67) was born in Pullman, Wash., on June 9, 1934. He received the B.A. degree from Reed College, Portland, Ore., in 1956 and the M.A. and Ph.D. degrees in physics from Stanford University, Stanford, Calif., in 1958 and 1962, respectively.

From 1962 to 1964 he was employed by Standard Telecommunications Laboratory, Harlow, Essex, England, where he worked on acoustic amplifiers and electron optics. From 1964 to 1968 he worked at the General Electric Electronics Laboratory, Syracuse, New York, where he did research on acoustic devices, bulk-effect devices, and avalanche diodes. In 1968 he joined the Electron Dynamics Division, Hughes Aircraft Company, Torrance, Calif., where he heads an applications group working on IMPATT-diode sources and amplifiers at microwave and millimeter-wave frequencies.

Dr. Midford is a member of the American Physical Society, Phi Beta Kappa, and Sigma Xi.

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H. R. Mitchell was born in Belfast, Northern Ireland, on October 22, 1940. He received the B.Sc. and Ph.D. degrees, both in electrical engineering, from the Queen's University of Belfast, Northern Ireland, in 1963 and 1967, respectively.

Since 1967 he has been Assistant Professor in the Department of Electrical Engineering, Queen's University, Kingston, Ontario, Canada. He has been engaged in research on the modeling of semiconductor devices and the performance of subharmonic parametric oscillators.

Dr. Mitchell is a Member of the Institution of Electrical Engineers, London.

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Koenraad Mouthaan was born in Numansdorp, The Netherlands, on February 25, 1941. He received the M.S. degree in electrical engineering from Delft Technological University, Delft, The Netherlands, in 1963, and the Ph.D. degree in electrical engineering from the University of California, Berkeley, in 1965.

After serving with the Royal Netherlands Air Force, he joined Philips Research Laboratories, Eindhoven, The Netherlands, in 1967 where he has been working on solid-state

microwave generation. His primary interests are electromagnetic theory and statistical physics.

Dr. Mouthaan is a member of the American Association for the Advancement of Science, the Dutch Physical Society, and Eta Kappa Nu.

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Sigemichi Nagano was born in Shizuoka, Japan, on February 2, 1939. He graduated from the Department of Electronics Engineering, Shizuoka University, Shizuoka, Japan, in 1961.

He joined the Nippon Electric Company, Ltd., Kawasaki, Japan, in 1961 and is now a Research Engineer in the Electron Device Laboratory, Central Research Laboratories. He has been engaged in the research and development of solid-state microwave and milimeter-wave electron devices.

Mr. Nagano is a Member of the Institute of Electronics and Communication Engineers of Japan.

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S. Yegna Narayan (M'64) received the B.Sc. degree (Honors) from the University of Delhi, India, in 1959, the B.E. degree (Distinction) from the Indian Institute of Science, Bangalore, India, in 1962, and the M.S. and Ph.D. degrees from Cornell University, Ithaca, N. Y., in 1964 and 1966, respectively.

His graduate research dealt with the coupling of microwave energy to plasma systems. Since joining the staff of RCA Laboratories, Princeton, N. J., in 1966, he has been working in the area of high-power epitaxial GaAs transferred electron effect devices. Most of his effort has been on the development of high-power CW *X*-band TEOs. His work has been reported at various conferences and journals. He was the recipient of the RCA Laboratories Outstanding Achievement Award for a team effort in the development of GaAs transferred electron device technology.

Dr. Narayan is an associate member of Sigma Xi and a member of the American Physical Society.

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Thomas L. Osborne (S'60–M'61) was born in Paducah, Ky., on November 19, 1934. He received the B.E.E. and M.S. degrees in electrical engineering from Auburn University, Auburn, Ala., in 1961 and 1963, respectively. He held a National Science Foundation Cooperative Graduate Fellowship in 1962 and 1963.

From 1954 to 1957, while in the U. S. Army, and in 1958 and 1959, while employed by Associated Aero Science Laboratories, he was a radar instructor at the Ordinance Guided Missile School, Huntsville, Ala. In 1961 and 1962 he was an Instructor in Electrical Engineering at Auburn University. In 1963 he joined the Bell Telephone Laboratories as a Member of the Technical Staff at the Crawford Hill Laboratory, Holmdel, N. J., where he has been involved in research on microwave and millimeter-wave radio systems.

Mr. Osborne is a member of Sigma Xi, Phi Kappa Phi, Eta Kappa Nu, Tau Beta Pi, and Pi Mu Epsilon.

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R. P. Owens, photograph and biography not available at the time of publication.

Ira W. Pence, Jr., was born in Pontiac, Michigan, on June 18, 1939. He received the B.S. degree in science engineering and the M.S. degree in electrical engineering from the University of Michigan, Ann Arbor, in 1962 and 1964, respectively.

In 1962 he joined the staff of the Willow Run Laboratories' Infrared Laboratory where he was engaged in developing the radar signature for early ballistic missile flights. He was also responsible for the design and implementation of the automated information storage and retrieval system used by the Ballistic Missile Radiation and Analysis Center. In 1964 he was named Technical Administrator for Project AMOS and was responsible for the design, procurement, and operational readiness of supporting hardware and instrumentation. This assignment included one year of field installation and testing. In 1967 he joined the staff of the Cooley Electronic Laboratory, Ann Arbor, Mich., where he has been primarily concerned with the development of broad-band models for packaged Gunn-effect devices.

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Barry S. Perlman (M'65) was born in Brooklyn, N. Y., on December 5, 1939. He received the B.E.E. degree from the City College of New York, N. Y., and the M.S. E.E. degree from the Polytechnic Institute of Brooklyn, Brooklyn, N. Y., in 1961 and 1964, respectively. He is presently pursuing the Ph.D. degree in electrophysics at the Polytechnic Institute of Brooklyn, with emphasis on solid-state physics and advanced network theory.

During 1961 he was a design and development trainee with Applied Research, RCA, Camden, N. J.; MSR, Moorestown, N. J.; ACCD, Burlington, Mass.; and ACL, New York, N. Y. His work included signal processing, radar receivers, and parametric devices. From 1961 to 1968 he was a Member of the Staff of the Advanced Communications Laboratory, RCA-CSD, New York, N. Y., becoming a Senior Member of the Technical Staff in 1966. He was primarily concerned with advanced receiver techniques such as the development of all-solid-state microwave troposcatter and relay subsystems, airborne *X*-band receivers, integrated circuits, high-level parametric circuits, dielectric and superconducting microwave filters, and fabrication and application of Si avalanche devices. In June 1968 he joined the Microwave Applied Research Laboratory at the David Sarnoff Research Center, RCA Laboratories, Princeton, N. J., as a Member of the Technical Staff, where he is presently working on transferred electron oscillators and amplifiers. He has published more than 18 technical papers in the field of solid-state devices and microwave networks and has made eight patent disclosures with one pending.

Mr. Perlman is a member of the New York State Society of Professional Engineers.

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Samuel T. Plants (SM'60) was born in Detroit, Mich., on August 16, 1928. He received the B.S.E.E. degree from Michigan College of Mining and Technology, Houghton, in 1950, and the M.S.E. and Ph.D. degrees in engineering from the University of California, Los Angeles, in 1960 and 1970, respectively.

From 1951 to 1959 he worked for Douglas Aircraft Company, El Segundo, Calif., where he was Assistant to the Electrical Power Coordinator. In 1959 he joined Hughes Aircraft Company, Culver City, Calif., and is currently a Senior Member of the Technical Staff. He has been in charge of the design and development of the regulated power supplies on the SYNCOM, Early Bird,

INTELSAT II, ATS, TACSAT, and INTELSAT IV Satellites and is now engaged in communication-satellite-system studies.

Dr. Plants served on the IEEE committee involved in the preparation of standards devoted to power-supply terminology definitions and measurement techniques from 1960 to 1970. He served as committee secretary from 1965 to 1969, at which time he assumed the committee chairmanship.

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Horst Pollmann was born in Homberg, Germany, on November 20, 1938. He received the Dipl.-Ing. degree in electrical engineering from the Aachen Technical University, Aachen, Germany, in 1963.

In 1964 he joined the Research Institute of AEG-Telefunken, Ulm, Germany, where he has worked on microwave bulk and transit-time effects in semiconductors.

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H. John Prager (M'63) was born in Vienna, Austria, on September 26, 1915. He received the B.S.E.E. degree from the University of Vienna, Austria, in 1938 and the M.S.E.E. degree from the University of Michigan, Ann Arbor, in 1940.

From 1940 to 1942 he was associated with the Research Laboratory of the Detroit Edison Company, Detroit, Mich. In 1943 he joined the Electron Tube Division, RCA, Harrison, N. J., as a Production Engineer of small-power and receiving tubes. In 1944 he transferred to the Receiving Tube Development Group where he worked as Design Engineer, Technical Coordinator, and Unit Leader until 1959. His assignments during that time included the design of several entertainment-type receiving tubes as well as premium industrial tubes, gas-filled tubes, and UHF pencil tubes. From 1954 until 1959 he served as a member of the JETEC-12 Committee and was an Evening Instructor at the Newark College of Engineering, Newark, N. J. In 1959 he became a Member of the Technical Staff at RCA Laboratories, Princeton, N. J., where he was assigned to the Microwave Research Laboratory. He has since been engaged in various studies on microwave semiconductor devices, such as varactors, tunnel diodes, Hall-effect devices, solid-state optical devices, and avalanche diodes. In 1960 he was corecipient of an RCA Achievement Award for team work on research leading to the first tunnel-diode amplifier and down converter. In 1967 he was again presented with an RCA Laboratories Achievement Award for outstanding team performance.

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James F. Reynolds received his B.E.E., M.E.E., and Ph.D. degrees from Rensselaer Polytechnic Institute, Troy, N. Y., in 1964, 1965, and 1967, respectively.

His doctoral thesis investigated methods of stabilizing gaseous magnetoplasmas by controlling the magnetic-field geometry. His earlier graduate research was concerned with the use of microwave techniques for plasma diagnostics. He has publications in both areas. Since joining the Advanced Technology Laboratory, RCA, Princeton, N. J., in 1967, he has been engaged in work on Si and GaAs active microwave devices. In 1968 he received an RCA Laboratories Achievement Award for his research on transferred electron oscillators and has several publications in this area.

Dr. Reynolds is an associate member of Sigma Xi.

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Fred J. Rosenbaum (S'57–M'63–SM'70), for a photograph and biography, please see page 673 of the September 1970 issue of this TRANSACTIONS.

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Shinji Sasagawa was born in Kyushu, Japan, on January 29, 1939. He received the B.S. degree in electrical engineering from Tokai University, Tokyo, Japan, in 1962.

In 1967 he joined the Radio Transmission Laboratory, Fujitsu Laboratories Ltd., Kawasaki, Japan, where he has been engaged in the research and development of microwave components and circuits, such as frequency converters and microwave integrated circuits. He is currently working on Gunn- and avalanche-diode oscillators.

Mr. Sasagawa is a member of the Institute of Electronics and Communication Engineers of Japan.

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Ernst F. Scherer was born in Rupperswil, Switzerland, on June 4, 1935. He graduated from Baden College of Engineering, Baden, Switzerland, in 1956, and he received the Diploma in Electrical Engineering (communication) from the Institute of Technology, Zurich, Switzerland, in 1960.

Following graduation, he joined the Microwave Laboratory of Brown Boveri Company, Baden, Switzerland, where he gained three years of experience in the field of microwave theory and techniques, with particular emphasis on theoretical and experimental work on varactor multipliers. From 1964 to 1966, he was employed at Microwave Associates, Burlington, Mass., where he was responsible for the design and development of solid-state sources and microwave television relay and communications equipment. He joined the Semiconductor Division, Sylvania Electric Products, Inc., Woburn, Mass., in 1966 and is presently working as Project Engineer on the development of avalanche devices and associated circuitry.

Mr. Scherer is a member of the Swiss Institution of Architects and Engineers.

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William E. Schroeder (S'67) was born in Takoma, Maryland, on July 21, 1943. He received the B.S. degree in 1965 and the M.S. degree in 1967, both in electrical engineering, from the University of Michigan, Ann Arbor, Mich. During the 1966–67 academic year he held a Boeing Scholarship for graduate study. He has served as a Teaching Assistant in electrical engineering. He is presently a National Science Foundation trainee working toward the Ph.D. degree in the Electron Physics Laboratory, Department of Electrical Engineering, University of Michigan.

Mr. Schroeder is a member of Eta Kappa Nu, Tau Beta Pi, and Sigma Xi.

Donald H. Steinbrecher (M'60) was born in Eustis, Fla., on July 1, 1936. He received the B.S.E.E. degree with high honors from the University of Florida, Gainesville, in 1960, and the S.M. and Ph.D. degrees from the Massachusetts Institute of Technology, Cambridge, in 1963 and 1966, respectively.

From 1960 to 1961 he was with Electronics Communications, Inc., St. Petersburg, Fla., where he worked on the development of ultrahighfrequency receivers. Since 1962 he has been a Staff Member of the Research Laboratory of Electronics, Cambridge, Mass., and at present is Associate Professor of Electrical Engineering at M.I.T. His work in solid-state microwave electronics has been devoted to developing fundamental performance limits for diodes in various applications and circuits realizing near-optimum performance at high-microwave frequencies.

Dr. Steinbrecher is a member of the American Association for the Advancement of Science, Sigma Xi, and Sigma Tau.

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Fred Sterzer (M'56–SM'68–F'69) received the B.S. degree in physics from the College of the City of New York, New York, in 1951, and the M.S. and Ph.D. degrees in physics from New York University, New York, in 1952 and 1955, respectively.

From 1952 to 1953 he was employed by the Allied Control Corporation, New York, N. Y. During 1953 and 1954 he was an Instructor in Physics at the Newark College of Engineering, Newark, N. J., and a Research Assistant at New York University. He joined RCA in 1954 and is now Manager of RCA's Advanced Technology Laboratory, the David Sarnoff Research Center, Princeton, N. J., which has the responsibility for developing new processes, devices, and subsystems for the divisions comprising RCA Electronic Components. His work has been in the field of microwave spectroscopy, microwave tubes, electrooptic modulators and demodulators, and microwave solid-state devices. He is the author of approximately 55 technical papers and holds 19 patents in the microwave field.

Dr. Sterzer is a member of Phi Beta Kappa, Sigma Xi, and the American Physical Society.

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J. A. Carson Stewart was born near Belfast, Northern Ireland, on March 9, 1937. He received the B.Sc. degree in physics in 1959 and the Ph.D. degree in electrical engineering in 1963, both from Queen's University, Belfast.

From 1964 to 1965 he worked at Short Brothers and Harland Ltd., Belfast, on a microwave radio altimeter. From 1965 to 1966 he was a Postdoctoral Fellow at the Queen's University, Kingston, Ontario, Canada, working on a microwave radiometer for Radio Astronomy applications. In 1966 he became an Assistant Lecturer and in 1967 a Lecturer in the Department of Electrical Engineering, Queen's University, Belfast, where his research interests are primarily with the modeling, circuit analysis, and fabrication of IMPATT diodes.

Brian C. Taylor (M'66) was born in Belfast, Northern Ireland, on June 30, 1940. He received the B.Sc. and Ph.D. degrees in electrical engineering from the Queen's University of Belfast, Northern Ireland, in 1962 and 1964, respectively, for work on microwave propagation in nonuniformly loaded waveguides.

From 1965 to 1967 he was a Lecturer in Electrical and Electronic Engineering at the University of Leeds, Leeds, England. He is currently a Senior Scientific Officer at the Royal Radar Establishment, Malvern, England, and is leading a team engaged in research on transferred electron devices.

Dr. Taylor is a graduate member of the Institution of Electrical Engineers, London.

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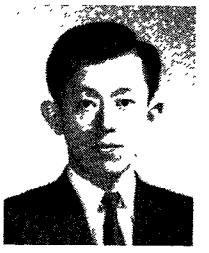

Masataka Tokida was born in Shiga, Japan, on May 5, 1938. He received the B.S. degree in electronics engineering from Kyoto University, Kyoto, Japan, in 1962.

Since 1962 he has been with Fujitsu Laboratories, Ltd., Kawasaki, Japan, where he has been concerned with exploratory studies on sheet metallic magnetic material and solid-state microwave generators.

Mr. Tokida is a member of the Institute of Electronics and Communication Engineers of Japan and The Japan Society of Applied Physics.

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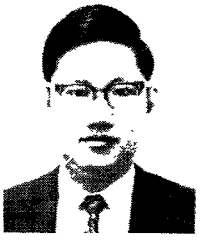

Wei Ching Tsai was born in Pei-Kang, Taiwan, China, on June 10, 1939. He received the B.S. degree in engineering from the National Taiwan University, Taipei, Taiwan, in 1962 and the M.S. and D.Sc. degrees in electrical engineering from Washington University, St. Louis, Mo., in 1966 and 1970, respectively.

From 1966 to 1967 he was an Engineer in the Research and Development Department of Dresser SIE, Inc., Houston, Tex. In January, 1967, he returned to Washington University, where he worked on the characterization of Gunn-effect oscillators toward the D.Sc. degree. In 1969 he joined Micro State Electronics Operation of Raytheon Company, Murray Hill, N. J., where he has been working on the development of GaAs IMPATT diodes and avalanche-diode amplifiers in microwave integrated circuits.

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Chainulu L. Upadhyayula received the B.Sc. degree in physics and the M.Sc. degree in applied physics from Andhra University, India, in 1955 and 1958, respectively, and the Ph.D. degree in engineering from Brown University, Providence, Rhode Island, in 1968.

From 1958 to 1959 he was a trainee in the Atomic Energy

Establishment, Bombay, India. From 1959 to 1964 he worked in the area of nuclear electronic instrumentation with the Electronics Division of the Atomic Energy Establishment. From 1964 to 1967 he was a Research Assistant and Teaching Assistant in Engineering at Brown University where he was engaged in the study of electrical transport properties of semiconductors. From 1968 to 1969 he was a Postdoctoral Fellow in Engineering at Brown University, studying tunneling through superconducting metal-insulator-metal structures at cryogenic temperatures. He joined the Advanced Technology Laboratory of the David Sarnoff Research Center, RCA, Princeton, N. J., in 1969 and is presently concerned with semiconductor devices and device physics.

Dr. Upadhyayula was awarded a General Telephone and Electronics fellowship in 1967–1968 for his graduate study. He is a member of Sigma Xi.

Sherman Weisbrod was born in Brooklyn, N. Y., on March 16, 1941. He attended the State University of N. Y., Buffalo, and completed the Advanced Electronics course at RCA Institutes, New York, N. Y., in May 1961.

Since 1961 he has been employed as a Research Technician in the Solid-State Microwave-Devices Group of the Microwave Research Laboratory, RCA Laboratories, Princeton, N. J. During this time he completed the Transistor Course and the Vacuum Technology Course at the RCA Laboratories. He has been engaged in such projects as fabrication of tunnel diodes for microwave uses, Hall-effect isolators, and infrared, radiation from bulk GaAs. He has designed several high-power pulse generators and has written an RCA Technical Note on a low-impedance pulse generator. Since February 1966 he has been actively engaged in the High-Power Avalanche Diode project and has published a joint letter in the PROCEEDINGS OF THE IEEE, April 1967.