Contributors

J. Robert Ashley (S'52–A'53–SM'61) received the B.S.E.E. degree at the University of Kansas, Lawrence, in 1952, and the M.S.E.E. degree in 1956. In 1965, a National Science Foundation Engineering traineeship made possible his full-time attendance at the University of Florida, Gainesville, where he received the Ph.D. degree in electrical engineering in 1967.

He first worked with microwave systems as a U. S. Navy Electronic Technician in 1946 and 1947. He worked on megawatt klystrons at the Sperry Gyroscope Company for a year. He then joined the Sperry Electronic Tube Division in Gainesville, Fla., where his first major assignment was development of a low-noise two-cavity klystron oscillator (a predecessor of the one used in the papers in this issue). In addition to his work on several klystron oscillators, he performed magnetic focus computer studies, worked on several measurement problems associated with microwave tube performance, and studied the control of magnetically focused electron beams with negative grid guns. At present he is Associate Professor of Electrical Engineering at the Colorado Springs Center of the University of Colorado.

Dr. Ashley is a member of the Audio Engineering Society, Simulation Councils, Inc., Tau Beta Pi, Sigma Xi, Eta Kappa Nu, Sigma Pi Sigma, Kappa Eta Kappa, Sigma Tau, and Phi Kappa Phi.

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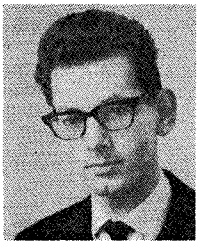

Werner Baechtold was born in Winterthur, Switzerland, on October 1, 1939. He received the diploma in electrical engineering from the Swiss Federal Institute of Technology, Zurich, in 1964.

Since 1965 he has been working in the Department of Advanced Electrical Engineering of the Swiss Federal Institute of Technology on noise measurements in the L- and S-bands. He has written four papers on his work.

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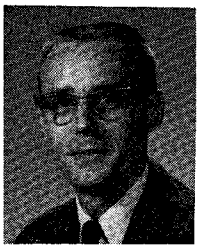
Dan A. Bathker (S'59–M'62) was born in St. Paul, Minn., on October 17, 1938. He received the B.S. degree in electronic engineering from California State Polytechnic College, San Luis Obispo, in 1961.



He was employed by Melabs, Palo Alto, Calif., as a Research Engineer in microwave component design. Since joining the Jet Propulsion Laboratory in 1963, he has been engaged in the research and development of high-performance antenna feeds and associated microwave equipment, as well as methods of evaluating large ground antenna performance. He is presently Supervisor of the Antenna and Propagation Group in the Telecommunications Division.

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Wilfred E. Brown (S'60–M'66) was born in Hartford, Conn., on November 29, 1940. He received the B.S.E.E. and M.S.E.E. degrees from Worcester Polytechnical Institute in 1963 and 1965, respectively.

Since 1965 he has been with NASA/Electronics Research Center, Cambridge, Mass., studying the atmospheric effects of millimeter wave propagation.

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Jean-Claude R. Collinet (M'68) was born in Montluçon, France, on July 6, 1937. He received the Diploma of Electrical Engineering from the Ecole Speciale de Mecanique et d'Electricité, University of Paris, in 1959, and the M.S. degree from the University of West Virginia, Morgantown, under a Fulbright Scholarship, in 1960. His thesis concerned varactor frequency modulation.

In January 1963, he joined Thomson-Varian, Paris, in the Solid-State Division as a Research and Design Engineer, where he was assigned to a low-noise *X*-band solid-state source project. He spent a year at Bomac Laboratories, Varian Associates, Beverly, Mass., as part of an exchange program between the two companies, where he worked on moderate power multipliers and sources. In April 1966, he joined the Advance Research and Source Engineering Division of Microwave Associates, Inc., Burlington, Mass., where he was engaged in the development of high-order high-power frequency multipliers and is presently involved in the design of low-noise bulk-effect microwave sources.

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Johannes A. De Gruyl received the B.E.E. degree from Middelbare Technische College, Hilversum, Netherlands, in 1946 and has taken postgraduate work at Philips Advanced Education Institute.

From 1947 to 1961 he worked for N. V. Philips Telecommunications Industries in the Radar Department. He joined Airborne Instruments Laboratory, Melville, N. Y., in 1961, working on advanced microwave components, traveling-wave masers, ferrite devices, and superconducting techniques. He is presently a consultant in the Department of Electrophysics of Airborne Instruments Laboratory.

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Colin Denson was born in Southend on Sea, England, on November 21, 1924.

From 1942 to 1946, he worked on production and subsequently development of klystrons and TR cells at E. K. Cole, Ltd., following which he served in the RAF as a radar engineer. In 1948 he joined the War Department as an early warning and fire control radar engineer, joining Nore Electric Company Ltd., Southend on Sea, as Chief Inspector, in 1954. In 1956 he was appointed Chief Engineer and in 1959 took over management of the Microwave Division. In 1966 he was appointed to the Board as Technical Director. His responsibilities have included the development and production of duplexing tubes, TR cells, and noise standards.

Mr. Denson is a corporate member of the Institution of Electrical Engineers.

John H. Dunn was born in Rochester, N. Y., on July 17, 1921. He received the B.S. degree in electrical engineering from University of Notre Dame, Notre Dame, Ind., in 1943.

Since 1943 he has been employed by the Naval Research Laboratory, Washington, D. C. From 1943 to 1947 he was engaged in research and development involving airborne equipment. Since 1947, he has been engaged in research and development work in the field of precision automatic-tracking radar. In 1956 he was appointed Head of the Tracking Branch of the Radar Division of NRL.

Mr. Dunn is a member of the NRL branch of RESA.

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Glenn F. Engen was born in Battle Creek, Mich., on April 26, 1925. He received the B.A. degree in physics and mathematics from Andrews University, Berrien Springs, Mich., in 1947, and has taken graduate work at the Universities of Michigan, Maryland, and Colorado.

After employment with the U. S. Naval Ordnance Laboratory and the Applied Physics Laboratory at The Johns Hopkins University, Baltimore, Md., he joined the National Bureau of Standards in 1954. Currently he is Assistant Chief of the Microwave Circuit Standards Section, Radio Standards Laboratory, at NBS. He has authored fifteen published papers in the field of microwave measurements and holds two patents.

Mr. Engen was awarded the Department of Commerce Silver Medal for Meritorious Service. He is a member of Commission I of the International Scientific Radio Union (URSI).

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William J. Foote was born in Baltimore, Md., on October 11, 1919.

After graduating from Baltimore City College, he worked as a machinist at the U.S. Naval Gun Factory and served a year in the U. S. Navy. Prior to his employment at the National Bureau of Standards, Boulder, Colo., in 1955, he worked in Washington as an instrument maker at NBS and as a model maker at the Diamond Ordnance Fuze Laboratory. Since joining the NBS Boulder Staff he has served as an instrument maker, spent a year on leave as a research associate in astrophysics at the University of Hawaii, and is now a mechanical engineering technician in the Radio Standards Laboratory.

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Johann-Peter Hach (A'63) was born in Flensburg, Germany, on May 31, 1938. He attended the Technische Hochschule, Braunschweig, Germany, from 1957 to 1959, and the Technische Hochschule, Stuttgart, Germany, from 1959 to 1962, where he received the Dipl.-Ing. degree.

In 1962 he entered the Deutsche Versuchsanstalt für Luft- und Raumfahrt, Institut für Flugfunk und Mikrowellen, Oberpfaffenhofen, where he has done work on parametric amplifiers and noise measurement techniques. Currently he is concerned with microwave radiometry.

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John Halford was born in Croydon, England, on May 8, 1921. He received the B.Sc. degree in physics at Kings College, London University, London, England, in 1941.

During World War II he worked on radar development for the Ministry of Supply at the Air Defense Research and Development Establishment, Christchurch, England. From 1943 to 1955 he was at the Radar Research and Development Establishment, later to become R.R.E., at Malvern, England, where he worked in the basic research group on transmitting valves, frequency multipliers, duplexers, and surface wave transmission. Since 1955 he has been employed by the Ministry of Defence (Navy) at the Services Valve Test Laboratory at Haslemere, England, where he is Head of the Low-Power Microwave Valve Group. Here he has been concerned particularly with duplexer, traveling-wave tube, and microwave diode development and the establishment of UHF and microwave noise standards.

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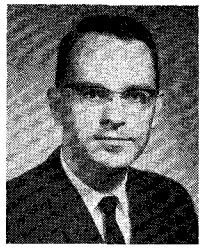
James A. Hall (S'57–M'62) was born in Halifax, Va., on December 11, 1936. He received the B.S. degree in electrical engineering from North Carolina State University, Raleigh, in 1959.



He joined the General Electric Company, Lynchburg, Va., in 1959 and since that time has been engaged in the development of broad-band IF amplifiers and discriminators, video amplifiers, solid-state microwave sources, and group delay equalization techniques for multichannel radio relay equipment.

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George G. Haroules (M'57) was born in Newton, Mass., on July 28, 1930. He received the B.S. degree from Northeastern University, Boston, Mass., in 1956.

From 1956 to 1963, he worked at Air Force Cambridge Research Laboratories in the Navigation Branch where he conducted radar experiments on propagation anomalies over seawater at microwave frequencies. He also developed the AN/TRN-17 and AN/TSW-6 navigation systems for the Air Force during this period. From 1963 to 1964, he was with the Experimentation Branch of the Systems Research and Development Service, FAA, where he conducted experimental studies of the various effects of weather clutter on long range surveillance radars. In 1964, he became a staff member of the Microwave Laboratory of ERC/NASA where he has been conducting experimental studies on atmospheric propagation characteristics at millimeter wavelengths.

Mr. Haroules is a member of the American Institute of Physics.

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Walter H. Higa (A'44–SM'54) was born in Maui, Hawaii, on September 21, 1919. He attended the University of Hawaii from 1938 to 1941, and received the B.S. degree in electrical engineering from Tri-State College, Angola, Ind., in 1942. After a brief service in the infantry, he continued his studies at the University of Cincinnati, Cincinnati, Ohio, where he received the M.S. degree in 1947, and the Ph.D. degree in 1949, both in physics.

He is a Research Group Supervisor in the Telecommunications Division of Jet Propulsion Laboratory. His specialty is low-noise amplifiers and cryogenics.

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

M. E. Hines (F'68) received the B.S. and M.S. degrees in applied physics from the California Institute of Technology, Pasadena, in 1946 and 1950, respectively.

He served as a weather officer with the Air Force from 1940 to 1945. With the Bell Laboratories from 1946 to 1960, he worked in the research and development of microwave tubes and storage tubes, parametric amplifiers, pulse transmission systems, and tunnel diode amplifiers and oscillators. At Microwave Associates, he has been most active in the development of harmonic generator type microwave sources and high-power microwave signal control devices using diode switch elements. At present he is a Vice President and Technical Director in the Engineering Group.

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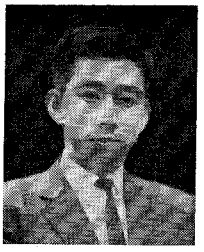

Kotaro Hirano (S'59–M'65) was born in Osaka, Japan, on December 1, 1935. He received the B.S., M.S., and Ph.D. degrees in communication engineering from Osaka University, Osaka, Japan, in 1960, 1962, and 1965, respectively.

In April, 1965, he joined the Faculty of Engineering, Kobe University, Kobe, Japan, as an Associate Professor of Electrical Engineering, where he is presently working on the problems related to the active circuit theory, i.e., the gain, noise, stability, sensitivity of amplifiers, and oscillators.

Dr. Hirano is a member of the Institute of Electronics and Communication Engineers of Japan and the Institute of Electrical Engineers of Japan.

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D. L. Hollway (SM'62) was born in Ballarat, Victoria, Australia, on December 5, 1915. He received the B.E.E. and M.Eng.Sc. degrees from Melbourne University, Australia, and the D.Sc.Eng. degree from Sydney University, Australia, in 1937, 1939, and 1954, respectively.

From 1940 to 1946, he served in the Valve Division of Standard Telephones and Cables Limited, Sydney, handling engineering problems in the production of transmitting, receiving, and radar tubes. Since joining the Commonwealth Scientific and Industrial Research Organization in 1946, he has developed theoretical and analog methods of determining electron motion in the presence of space-charge and magnetic fields, electron beam tubes, and measurement techniques at UHF and microwave frequencies.

Dr. Hollway is a senior member of the Institution of Radio and Electronic Engineers, Australia.

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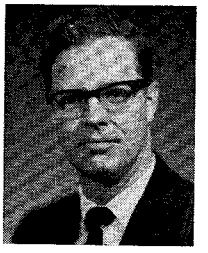

Dean D. Howard (S'47–A'50–M'55–SM'57) was born in Chatham, N. J., on January 2, 1927. He received the B.S. degree in electrical engineering from Purdue University, Lafayette, Ind., in 1949, and the M.S. degree in electrical engineering from the University of Maryland, College Park, Md., in 1952.

From 1949 to 1954 he was employed in the Radio Division, Communications Branch, of the Naval Research Laboratory, Washington, D. C., where he worked in the field of UHF communication. Since 1954 he has been working with the Radar Division of the Naval Research Laboratory in the Tracking Branch, engaged in basic research on tracking radar and target noise theory. He is presently Head of the Special Systems I Section of the Tracking Branch. He holds several U. S. patents on microwave devices.

Mr. Howard is a member of the NRL branch of RESA.

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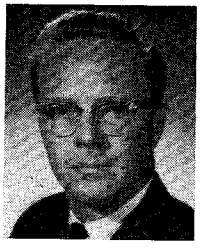
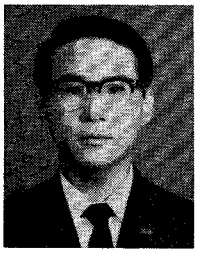


Walter A. Johnson (S'53–M'56) was born in New York, N. Y., on August 24, 1932. He received the B.E.E. degree from Cooper Union, New York, N. Y., in 1954, and the M.S.E.E. degree from California Institute of Technology, Pasadena, in 1955.

From 1955 to 1958 he was employed by Hughes Aircraft Company, Culver City, Calif., in the design of surveillance system displays and servomechanisms. In 1958 he joined Space Technology Laboratories, Inc., Redondo Beach, Calif., where he was involved in the design of communications and command systems for the Pioneer lunar probes and Syncom I. Since 1963 he has been employed by the Aerospace Corporation, El Segundo, Calif., where he is engaged in millimeter-wave systems research and engineering in the Electronics Research Laboratory.

Mr. Johnson is a member of Tau Beta Pi.



Seiichi Kanema was born in Kobe, Japan, on May 22, 1944. He received the B.S. degree in electrical engineering from Kobe University, Kobe, Japan, in 1967. He is presently studying for the M.S. degree at Kobe University.

Mr. Kanema is an associate member of the Institute of Electronics and Communication Engineers of Japan.

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James M. Kenney (M'66) was born in New York, N. Y. on December 12, 1931. He received the B.E.E. degree from the City College of New York, in 1954, and the M.S. degree in electrical engineering from Columbia University, New York, N. Y., in 1958.

Since 1954 he has been employed by the Naval Applied Science Laboratory, Brooklyn, N. Y., primarily in the field of microwaves. He has worked extensively on the development of measurement techniques and standards for microwave semiconductor devices and is currently investigating self-testing, self-repairing, and multifunction circuits. His present position is that of Senior Task Leader in charge of the semiconductor group of the Electronic Devices Branch.

Mr. Kenney has served on two IEEE task groups on varactor measurement standards, is an Associate Member of the Working Group on Microwave Devices of AGED, and is a member of the Antique Wireless Association.

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Gerald S. Levy (S'56–M'57) was born in Brooklyn, N. Y., in 1929. He received the B.S. degree from the University of Wisconsin, Madison, in 1952, and the M.S. degree from the Pennsylvania State University, University Park, in 1956, for work in ionosphere physics.

He was employed by Convair/San Diego as a Senior Research Engineer in electronic system research, where he investigated electromagnetic propagation problems associated with flight system design. In 1959 he joined the Communications Research Section of the Jet Propulsion Laboratory, where he is now

Section Manager. He has worked on low-noise receiver system calibration and large-aperture antenna calibration. He was a co-experimenter in the Mariner IV and Mariner V/Occultation experiments.

Mr. Levy is a member of Sigma Xi and the American Physical Society.

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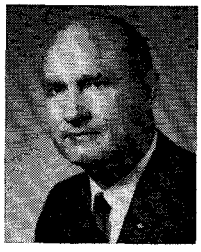

A. V. McDaniel, Jr., was born in Lynchburg, Va., on March 21, 1926. He received the B.S. degree in mathematics from Emory and Henry College, Emory, Va., in 1951.

From 1952 to 1956, he was employed by the Rubatex Division of Great American Industries, Bedford, Va. Since 1956, he has been with the General Electric Company in Lynchburg, Va. He is now an engineer engaged in the development of parametric amplifiers, harmonic generators, filters and multicouplers in both VHF and microwave frequencies.

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Tadao Mukaihata was born in Gardena, Calif., on February 10, 1924. He received the B.S. degree in physics from Denison University, Granville, Ohio, and the M.S. degree in electrical engineering from the University of California, Los Angeles, in 1949 and 1962, respectively.

Since 1949, he has been employed at Hughes Aircraft Company, Culver City, Calif., engaged in research and development work in electronic instrumentation and microwave components. He is currently the Senior Technical Administrative Assistant and Head of the Microwave Section of the Hughes Primary Standards Laboratory.

Mr. Mukaihata is a member of URSI, Commission I.

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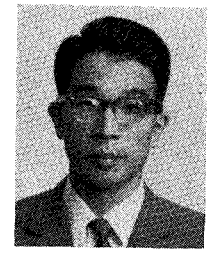
Toshio Nemoto (M'63) was born in Tokyo, Japan, on November 16, 1934. He received the B.S.E.E. degree from Maiji University, Tokyo, in 1958.

From 1958 to 1961, he was associated with the Research Laboratory of Precision Machinery and Electricity of the Tokyo Institute of Technology, where he was engaged in research on microwave high power measure-



ments and Q measurements. Since 1961, he has been associated with the Electrotechnical Laboratory, Ministry of International Trade and Industry, Tokyo, where he has been concerned with the establishment of the National Standards on Microwave Impedance. From 1966 to 1968, he worked in the National Bureau of Standards, Boulder, Colo., as a guest worker.

Mr. Nemoto is a member of the Institute of Electrical Communication Engineers of Japan.

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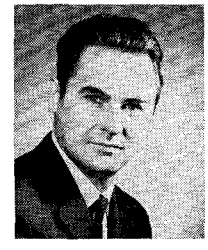

Seymour Okwit (A'55–M'60–SM'61 – F'66) was born in New York, N. Y., on August 31, 1929. He received the B.S. degree from Brooklyn College, Brooklyn, N. Y., in 1952, and the M.S. degree in applied mathematics and the M.S. degree in physics from Adelphi College, Garden City, N. Y., in 1957 and 1961, respectively.

He joined the Airborne Instrument Laboratory, Melville, N. Y., in 1955. He is currently Head of the Electrophysics Department, where he is responsible for and directs programs in solid-state devices including masers, parametric amplifiers, ferrite devices, bulk effects of semiconductors and superconducting components.

Mr. Okwit is currently the Editor of the IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES.

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K. W. Olson (SM'65) was born in New Hampton, Iowa, on October 14, 1926. He received the B.A. degree from Grinnell College, Grinnell, Iowa, in 1949, and an M.S. from Iowa State University, Ames, in 1954, both in physics.

In 1954 he joined the Bendix Corporation, Red Bank Division, where he held various engineering positions leading up to Supervisory Engineer of the Gas Discharge Tube Department. These assignments included development and direction of development and production engineering of gas discharge, high vacuum, and ferrite devices including spark gaps, microwave gas discharge noise sources, gas lasers and ferrite circulators, attenuators and phase shifters. In this activity he was a primary contributor to the improvement of speed of response of two-electrode spark gaps, reduction of jitter in triggered spark gaps, provision of an educational He-Ne gas laser and establishment of a microwave noise measurement calibration service available to industry. He served on two EIA committees, vacuum tube and power and gas tube, and with two military working groups in the same fields. Since 1965 he has been Manager of the Special Products Division of Signalite Incorporated with overall responsibility for the lines of spark gaps, microwave gas discharge noise sources, and flash tubes. Under his direction these devices have been employed as the critical active elements in specialized test equipment. He is the author of several published articles and holds four patents in the fields of spark gaps and microwave noise sources.

Mr. Olson is a member of IEEE Subcommittee 16 concerned with state-of-the-art microwave noise measurements, the American Physical Society, and the American Optical Society.

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John G. Ondria was born in Bethlehem, Pa. on December 31, 1934. He received the B.S., M.S., and Ph.D. degrees in electrical engineering from Lehigh University, Bethlehem, Pa., in 1960, 1963, and 1967, respectively.

From 1960 to 1964 he was employed by Western Electric Company, Allentown, Pa., and was assigned to Bell Telephone Laboratories to aid in the design and development of a low-noise C-band traveling-wave tube. After delivering this tube and establishing it in production at Western Electric, he was reassigned to Bell Telephone Laboratories to design and develop a parametric amplifier integrated strip line package with circulators for use in MAR radar. From July 1964 to July 1965 he was a consultant to Microwave Associates, Inc., Burlington, Mass., on noise theory. In July 1965 he joined Microwave Associates as a Senior Research Engineer and was engaged in noise studies of varactor multiplier sources and avalanche diode oscillators. He was responsible for the design and development of a low-noise microwave source consisting of a high-frequency L-band oscillator, followed by a single-stage high-order multiplier. He holds a patent on this device. In 1967 he joined the faculty of Lehigh University, Bethelhem, Pa., where he is now Assistant Professor of Electrical Engineering.

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

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Tom Y. Otoshi (S'53–M'56) was born in Seattle, Wash., on September 4, 1931. He received the B.S.E.E. and M.S.E.E. degrees

from the University of Washington, Seattle, in 1954 and 1957, respectively.

From 1956 to 1961, he was a member of the Technical Staff at Hughes Aircraft Company, Culver City, Calif., where he was engaged in guided missile checkout equipment development, microwave primary standards, antenna research, and the development of microwave components. In 1961, he joined the Communications Elements Research Section of the Jet Propulsion Laboratory (JPL) in Pasadena, Calif., where he is currently a Senior Engineer. He has been engaged in the analysis and calibration of low-noise systems and the development of cryogenic noise source standards.

Mr. Otoshi is a member of Tau Beta Pi and an associate member of Sigma Xi.

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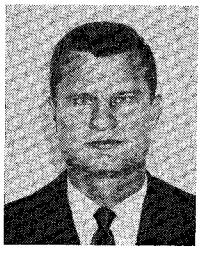

Frank M. Palka (S'56–M'57) was born in Oak Park, Ill., on October 11, 1930. He received the B.E.E. degree from the University of Florida, Gainesville, in 1956.

He joined the Sperry Electronic Tube Division, Gainesville, Fla., in 1956. While employed there, he was involved in research and development of klystron amplifiers, backward wave oscillators, and low-noise klystron oscillators. Since 1965, he has been employed at the Sperry Microwave Electronics Division, Clearwater, Fla., working on solid-state microwave devices.

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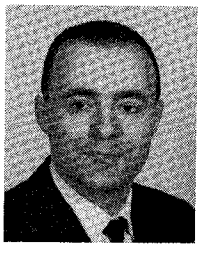

Arno A. Penzias was born in Munich, Germany. He received the B.S. degree in physics from the City College of New York, N. Y., in 1954. Following two years of service as an officer in the U. S. Army Signal Corps, he attended Columbia University, New York, N. Y., where he received M.A. and Ph.D. degrees in physics in 1958 and 1962, respectively.

Since 1961 he has been a Member of the Technical Staff of the Bell Telephone Laboratories. While his main interest is in radio astronomy, he is also the author of a number of papers in microwave and atmospheric physics. During the 1967–1968 academic year he was a Lecturer in the Department of Astrophysical Sciences at Princeton University, Princeton, N. J.

Dr. Penzias is a member of the IEEE Working Group on Noise Standards, Commission V of the USNC of URSI, the American Astronomical Society, the American Physical Society, and Phi Beta Kappa.

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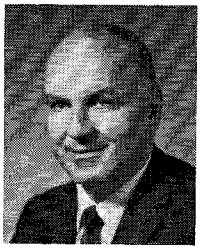

Harry J. Peppiatt (M'54–SM'68) was born in Newmarket, Ontario, Canada, on May 16, 1925. He received the B.A. degree in honor mathematics and physics in 1948, and the M.A. degree in physics in 1950, both from the University of Toronto, Ontario. In 1953, he received the Ph.D. degree from McGill University, Montreal, Quebec.

From 1950 to 1954, he taught physics at Loyola College, Montreal, Canada. Since then, he has been with the General Electric Co., Lynchburg, Va., working in the fields of single sideband and frequency-modulation tropospheric scatter, missile guidance, broadband FM microwave equipment, parametric amplifiers, multipliers, and switches. At the present time, he is a Consultant in Graduate Physics at Lynchburg College, Lynchburg, Va.

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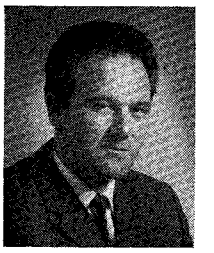
Klaus H. Sann (SM'60) was born in Driesen, Germany, on August 6, 1919. He received the Dipl. Ing. degree in electrical engineering from the Technische Universität, Berlin, Germany, in 1951.

In 1951 he joined the Vehicular Communication Department of the Telefunken GmbH, Berlin, and in 1956 transferred to the Telefunken branch in Ulm, Germany, where he was engaged in research and development of quartz crystals, crystal-controlled oscillators and semiconductor circuits. In 1959 he became a member of the Advanced Research Laboratory, Harry Diamond Laboratories, Washington, D. C., where he is presently a Research and Development Supervisor. His work has included the study of noise in microwave transmitters, solid-state microwave power generation, microwave acoustic delay lines, and special problems in radar systems.



Ernst F. Scherer (M'66) was born in Rupperswil, Switzerland, on June 4, 1935. After graduation from college in 1956, he received the Diploma in electrical engineering (Communication) from the Institute of Technology of Zurich, Switzerland, in 1960.

Following graduation, he joined the Microwave Laboratory of Brown Boveri Company, 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 has been responsible for the design and development of solid-state sources and microwave television relay and communications equipment. He joined the Semiconductor Division of 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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Wolfgang O. Schlosser was born in Bingen, Germany, on September 30, 1935. He received the D.Ing. degree from the Technische Hochschule, Darmstadt, Germany, in 1964.

From 1963 to 1966 he was engaged in microwave research work at the Technische Hochschule, Braunschweig, Germany. In 1966 he joined Bell Telephone Laboratories, Inc., Murray Hill, N. J., where he is a member of the Solid State Device Electronics Department.

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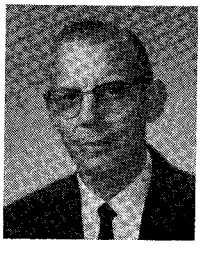

Clifford B. Searles (S'53–A'55–M'57) was born in Parsons, Kan., on September 3, 1921. He received the B.E.E. degree from the University of Florida, Gainesville, in 1954, where he later did graduate work in electrical engineering and in business management.

He joined the Technical Staff of Bell Telephone Laboratories, Murray Hill, N. J., to work with two-port switching devices. In 1955, he joined the Sperry Electronic Tube Division of Sperry Rand, Gainesville, as a Project Engineer. He was promoted to Senior Project Engineer in 1958, Engineering Section Head in 1959, and Senior Engineer in 1964; his responsibilities have included all types of klystron devices, covering the frequency range from 3 to 35 GHz. He has been involved in the design and development of low-noise two-cavity oscillators and with noise measurement techniques since 1958.

Mr. Searles is a member of Phi Eta Sigma, Phi Kappa Phi, Sigma Tau, the National Society of Professional Engineers, and the Florida Engineering Society.

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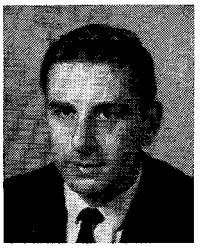

Boris L. Seidel (S'61 - M'63) was born in Chicago, Ill., on May 29, 1936. He received the B.S. and M.S. degrees in electrical engineering in 1961 and 1962, respectively, from the University of Illinois, Urbana.

Since 1962 he has worked in the Telecommunications Division of the Jet Propulsion Laboratory, California Institute of Technology, Pasadena, Calif. His primary duties have been to aid in the development of the ground receiving system for the Mariner IV Occultation Experiment and in the precision calibration of the ground portion of deep space communication systems. His present work is in the field of radio astronomical techniques as applied to the calibration of large antennas.

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

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Benjamin Senitzky was born in Poland on November 15, 1926. He received the B.S. and Ph.D. degrees, both in physics, from Columbia University, New York, N. Y., in 1944 and 1956, respectively.

From 1956 to 1959 he worked in the Research Department of Bell Telephone Laboratories on the clarification of the breakdown mechanism in semiconductors and the resulting electron emission due to the high breakdown fields. From 1959 to 1966 he devoted his time to laser research and the study of resonance saturation to achieve amplification in the millimeter wave region of the spectrum, at Technical Research Group Inc. (TRG). In September, 1966, he joined the faculty of the Electrophysics Department, Polytechnic Institute of Brooklyn, where he is now Associate Professor of Electrophysics. He holds two patents and has published several papers.

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

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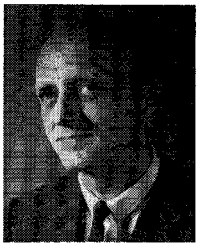

Joseph G. Smith (M'65) was born in Brooklyn, N. Y., on July 16, 1932. In 1955 he received the B.E.E. degree from the College of the City of New York, N. Y., and is currently working toward the M.S.E.E. degree at the Polytechnic Institute of Brooklyn, N. Y.

He was with the Servo Components Department of Sperry Gyroscope Company, Great Neck, N. Y., in 1955 before joining the service. In 1957 he joined the Bendix Aviation Corporation, Red Bank Division, Eatontown, N. J., where he worked in their gaseous discharge device group. He joined Airborne Instruments Laboratory, Melville, N. Y., in 1958. He has been associated with the Applied Electronics Department, concerned with the design and development of cavity and traveling-wave masers, ferrite and superconducting devices. He is presently a section head in the department of Electrophysics.

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P. I. Somlo was born in Budapest, Hungary, on May 15, 1933. He graduated from the University of Technology of Budapest in 1956.

He joined the Fine Mechanics Company in Budapest where he was engaged in the development and design of high frequency laboratory equipment. In 1957 he joined the Standard Telephones and Cables Company, London, where his work was in connection with microwave repeater stations. In 1957 he joined the National Standards Laboratory of the Commonwealth Scientific and Industrial Research Organization in Sydney, Australia, where his work is in connection with VHF–UHF impedance standards, and with the standard of microwave noise.

Mr. Somlo is an associate member of the Institution of Engineers, Australia.

Charles T. Stelzried (S'57 - M'61) was born in Los Angeles, Calif., on September 14, 1928. He received the B.S. and M.S. degrees from the University of California at Los Angeles, in 1957 and 1959, respectively.

He has been at the Jet Propulsion Laboratory, Pasadena, Calif., since 1953 and is currently engaged with deep space communication research as supervisor of the Radio Frequency Techniques Group. He has several patent disclosures on microwave devices.

Mr. Stelzried is a member of Tau Beta Pi, AAAS, and Sigma Xi.

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Max J. O. Strutt (SM'46–F'56) was born in Surakarta, Java, on October 2, 1903. He has attended the University of Munich, Germany, and the Institute of Technology, Munich. He received the M.Sc. degree (cum laude) in 1926 and 1927, respectively, from the Institute of Technology, Delft, The Netherlands.

He was a Research Engineer at the N. V. Philips Company, Ltd., Eindhoven, The Netherlands, from 1927 to 1948. Since 1948 he has been Professor and Director of the Department of Advanced Electrical Engineering, Swiss Federal Institute of Technology, Zürich, Switzerland, and from 1958 to 1960, Chairman of the Division of Electrical Engineering there. In 1961, 1962, and 1963 he was Visiting McKay Professor of Electrical Engineering at the University of California, Berkeley.

Dr. Strutt holds more than seventy United States patents on electron tubes and circuits, especially VHF and UHF. Among his awards are the Doctor Honoris Causa, conferred by the Institute of Technology, Karlsruhe, Germany, in 1950, and the Karl Friedrich Gauss Medal of the Society of Sciences, Brunswick, Germany, received in 1954. He was awarded a Senior Foreign Scientist Fellowship by the National Science Foundation in Washington D.C., in 1966. In addition, he is a member of the Swiss Society of Electrical Engineers, the German Society of Electrical Engineers, the Swiss Society of Sciences at Berne, the German Physical Society, the Swiss Mathematical Society, and the Zürich Physical Society. He is an honorary member of the Society of Sciences at Brunswick (1955), of the International Television Committee (1956), of the Electronics Association of Japan (1966), and of the Institute of Electrical Communication Engineers of Japan (1967).

Charles L. Trembath (S'54–M'59) was born in Sheridan, Wyo., on January 9, 1929. He received the B.S. degree in electrical engineering in 1958 from the University of Colorado, Boulder, and has done graduate work at the University of Colorado and the National Bureau of Standards.

He served in the U. S. Army from 1951 to 1954 and during 1953 was Maintenance Officer of the Mukden Cable in Korea. In 1954, he joined the NBS Propagation Engineering Division where he worked on radio-wave propagation systems. In 1959, he joined the Radio Standards Division of NBS where he began work on high-temperature noise standards. His most recent work has been with cryogenic and low-temperature noise standard development and low-noise measurement techniques with a maser radiometer.

Mr. Trembath is a member of the Scientific Research Society of America and the American Association for the Advancement of Science. He is currently Chairman of the Denver–Boulder Chapter G-MTT.

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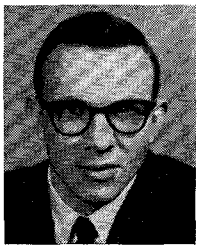

David F. Wait was born in Sidney, Neb., on September 28, 1933. He received the B.S. and M.S. degrees in physics from Colorado State University, Fort Collins, in 1955 and 1957, respectively, and received the Ph.D. degree in physics from the University of Michigan, Ann Arbor, in 1962.

In 1963, he was a Senior Scientist with the saturable filter group at the Laser System Center of Lear Siegler, Inc., Ann Arbor, Mich. From 1964 to the present he has been with the National Bureau of Standards, Boulder, Colo., where he has worked on cryogenic microwave noise standards.

Dr. Wait is a member of the American Physical Society, the Scientific Research Society of America, Kappa Mu Epsilon, Kappa Kappa Phi, and Omicron Delta Kappa.