Contributors

John W. Amoss (M'62) was born in Fairburn, Ga., on September 25, 1933. He received the B.E.E. degree from Auburn University, Auburn Ala., in 1958; the M.S.E.E. degree from the Georgia Institute of Technology, Atlanta, in 1958; and has done further graduate work at Auburn during 1964.

In 1959, he joined Sperry Microwave Electronic Company, Clearwater, Fla., where he is now a member of the Research Staff. His work at Sperry has been in the area of parametric devices, tunnel diode amplifiers, low-noise figure measurement techniques, system noise analysis, measurements of microwave properties of ferroelectric materials, and the application of ferroelectric materials in microwave devices.

Mr. Amoss is a member of Eta Kappa Nu and Pi Mu Epsilon.

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Sidney Arnow (M'62) was born in Brooklyn, N. Y., on August 22, 1936. He received the B.S.E.E. degree from the Polytechnic Institute of Brooklyn in 1961.

Since that time he has been working as a Microwave Development Engineer at Wheeler Labs., Inc., Great Neck, N. Y. Among the projects he has worked on are a moving-horn method of measurement of feedhorn reradiation, a technique for measurement of monopulse RF channels by means of radiation patterns, and a metal-prong polarization converter for disc-loaded waveguide.

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N. F. Audeh (S'61–M'62) was born in Jordan, on February 11, 1932. He received the B.S. degree from South Dakota State College, Brookings, in 1957. In 1957, he served as a Graduate Assistant at Iowa State University, Ames, where he received the M.S. and the Ph.D. in electrical engineering in 1959 and 1962, respectively.

He was an Instructor at Iowa State University from 1958 to 1962 when he became Assistant Professor of Electrical Engineering. He was an Associate Professor at California State College, Los Angeles, in 1963–1964. Presently, he is an Associate Professor at the University of Alabama, Huntsville, and is carrying on a research program in electromagnetic wave propagation at the University Research Institute, partially under a grant from National Aeronautics and Space Administration.

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John W. Bandler was born in Jerusalem, Palestine, on November 9, 1941. He received the University of London B.Sc. (Eng.) degree in electrical engineering at the Imperial College of Science and Technology, London, England, in 1963.

He has remained at the Imperial College where he is currently engaged in research on tunnel-diode amplifiers in rectangular waveguides for the Ph.D. degree of the University of London. His work in the Microwave Laboratory of the Electrical Engineering Department is supported by a Research Studentship from the Science Research Council.

Mr. Bandler is an Associate of the City and Guilds of London Institute, and a graduate member of the IEE, Great Britain.

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Norman J. Brown (S'52 – A'53 – M'59) was born in Ipswich, Mass., on January 26, 1928. He received the B.S. and M.S. degrees in electrical engineering from Northeastern University, Boston, Mass. He received his degrees in 1953 and 1957, respectively.

From 1951 to 1957 he was with Bomac Laboratories Inc., Beverly, Mass., where he worked on gas switching (TR) tubes. Since 1957 he has been affiliated with Microwave Associates, Inc., Burlington, Mass., where he continued working on gas switching tubes, specializing in high power duplexing. In 1963 he became Product Manager of the Solid-State Control Device Group.

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William P. Clark (S'58–M'59) was born in Hackensack, N. J., on September 19, 1932. He received the B.S. degree in electrical engineering at the Pennsylvania State University, University Park, and the M.S. degree in electrical engineering at the University of Southern California, Los Angeles, in 1959 and 1961, respectively.

In 1959 he joined the Ground Systems Group of Hughes Aircraft Company as a member of the Technical Staff. Since that time he has worked on microwave ferrite devices with particular emphasis on analog and digital phase shifters for phased-array systems.

Mr. Clark is a member of Tau Beta Pi, Eta Kappa Nu, and Phi Kappa Phi.

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J. Dobson was born in Sheffield, England, July 24, 1936. He received the B.S. and the Ph.D. degrees in engineering at the University of Sheffield in 1957 and 1961, respectively.

From 1961 until 1963 he remained at the university as a Senior Research Assistant. He joined the staff of the Stanford Linear Accelerator Center (SLAC) as a Microwave Engineer in 1963 and returned to Sheffield University as a Lecturer in electronic and electrical engineering in 1964. His special fields are radio frequency gas discharges and mm-wave generation.

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Merle R. Donaldson (S'46–A'49–SM'55) was born in Silverdale, Kan. He received the B.E.E., M.S.E.E., and Ph.D. degrees from the Georgia Institute of Technology, Atlanta, in 1946, 1947, and 1959, respectively.

He was a member of the Electrical Engineering Faculty, Georgia Institute of Technology, from 1940 to 1946. From 1950 to 1957 he was employed by the Oak Ridge National Laboratory (ORNL) in various assignments involving the concept, design, and construction of radio frequency, electromagnetic and the instrumentation systems related to heavy particles cyclotrons. During this time he completed his dissertation at ORNL. He was employed by Electronic

Communication, Inc., St. Petersburg, Fla., from 1957 to 1963 and was engaged in various problems associated with research and design on communication receivers and other allied military electronic equipment including studies on broad-band noise suppression, band-pass filter, antennas, propagation, and phased arrays. In 1962 he was an Associate Professor of Electrical Engineering at the University of Florida, Gainesville, and Academic Supervisor of the Tampa Bay off-campus center for graduate study.

Dr. Donaldson joined the College of Engineering, University of South Florida, Tampa, in September 1964 and is currently Professor and Chairman of the Electrical Program. He has been a Research Staff Consultant with Sperry Microwave Electronics Company, Clearwater, Fla., since 1963, engaged in problems in ferroelectric phase shifters and switches.

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

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Lee B. Fletcher was born in Nevada City, Calif., on December 18, 1936. He attended Wenatchee Junior College, Wash., the University of Nebraska, Lincoln, Neb., and Texas Western University, El Paso, Texas.

From 1953 to 1958 he served in the U. S. Air Force. Prior to joining Watkins-Johnson Company, he was associated with Varian Associates. He has worked in the area of high-power traveling-wave tube research and development. He contributed to the development of the mode suppression techniques necessary for high-power coupled-cavity tube design. Subsequent to this work he worked on beam-type parametric amplifier and low-noise traveling-wave tube developments. Since 1961, he has been engaged in research and development of tunable microwave devices using ferrimagnetic resonance tuning.

Mr. Fletcher, a member of the Technical Staff of Watkins-Johnson Company, is presently engaged in solid-state devices development. His main work has been in the area of tunable parametric amplifiers, tunable transistor oscillators, and complete solid state microwave receiver front ends.

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Georg Goubau (A'49–SM'56–F'57) was born in Munich, Germany, on November 29, 1906. He received the M.A. degree in physics in 1931 from the Institute of Technology, Munich, Germany, and the Ph.D. degree in 1932, also from the Institute of Technology.

From 1931 to 1939 he was engaged in research and teaching at the Institute of Technology, Munich. In 1939 he was appointed Professor and Director of the Department of Applied Physics at the University of Jena, now in East Germany. Since 1947 he has been with the U. S. Army Electronics Research and Development Lab., Fort Monmouth, N. J. His early contributions were in the field of ionospheric research, but later his major interest turned to microwave theory and techniques. He co-authored and edited a book on electromagnetic waveguides and cavities, which has since been translated into English.

Dr. Goubau received the Harry Diamond Memorial Award of the IRE for his basic contribution to the theory of surface waves and the invention of the surface wave transmission line in 1957. He is a member of Sigma Xi, the Administrative Committee of the IEEE Antennas and Propagation Group, and US Commission VI of URSI.

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Lawrence Gould (SM'58) was born in Boston, Mass., on November 28, 1930. He received the B.S. and Ph.D. degrees in physics from the Massachusetts Institute of Technology, Cambridge, in 1950 and 1953, respectively.

On graduating, he joined Microwave Associates, Inc., Burlington, Mass., as a Research Physicist working on problems of high power microwave breakdown and gas switching devices. In 1959, he was appointed Vice President and Manager of the Electron Tube and Device Division. This Division was responsible for research, development, and manufacturing of power tubes, gas duplexers, plasma devices, ferrite devices, and semiconductor active and passive microwave circuits. In July 1962, he assumed the position of Executive Vice President and General Manager.

Dr. Gould is a member of the American Physical Society, and Sigma Xi.

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Harold A. Hogg was born in Essex, England, on June 29, 1926. He received the B.Sc. degree in physics from London University, England, in 1952.

He was a member of the scientific staff and the senior scientific staff at the Research Laboratories of the General Electric Company, Ltd., Wembly, England, for nearly ten years. From 1959 to 1961, he was on leave from the General Electric Company and served as a Research Associate at the Electronics Research Laboratory of Stanford University. He was a Senior Research Engineer at Microwave Electronics Corporation, Palo Alto, Calif., for two years. He then joined the Stanford Linear Accelerator Center (SLAC) in 1964.

Mr. Hogg holds nine British patents and has applied for one American patent; he is a Graduate Member of the Institute of Physics.

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Tom M. Hyltin (S'51–A'54–M'60) was born in Temple, Tex., on October 22, 1930. He received the B.S. degree in electrical engineering from the University of Texas, Austin, in 1957.

From 1953 to 1956, he was employed by Kiva Exploration Corporation in Austin, where he was concerned with the design of electronic geophysical prospecting equipment. In 1956, he joined the staff of the Electrical Engineering Research Laboratory at the University of Texas. Here he was engaged in projects in radiometry and propagation at millimeter wavelengths. He was with Temco Aircraft Corporation for one year, working on projects associated with missile guidance. Since joining Texas Instruments, Apparatus Division (Dallas), in 1958, Mr. Hyltin has been engaged in research and development of parametric amplifiers and solid-state harmonic generators. He has made contributions to theory and to circuits for parametric amplification and harmonic generation using varactor diodes. Recent projects have included the technical guidance of advanced *S*- and *C*-band parametric amplifier circuits and research and development programs in other solid-state microwave components.

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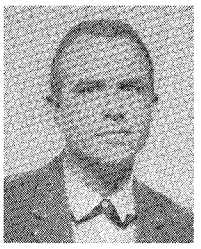
Fred Jellison (M'60) was born in Bar Harbor, Me., in 1934. He attended Bowdoin College, Brunswick, Me., and Tufts University, Medford, Mass., receiving the B.S. degree in physics from Tufts in 1956.

From 1957 to 1960 he was associated with Bomac Laboratories, Inc., Beverly, Mass., and worked on the design and development of gas switches. In 1960 he joined the Gas Switching Group at Microwave Associates, Inc., Burlington, Mass., where he has been primarily involved in high power duplexer engineering. Since 1964 he has been the Product Manager of Gas Switch Engineering.



Raymond R. Jones (M'65) was born in Baltimore, Md., on July 11, 1937. He received the B.S. degree from Loyola College, Baltimore, Md., and the M.S. degree from Drexel Institute, Philadelphia, Pa., both in physics, in 1959 and 1963, respectively.

From 1959 to 1962 he was associated with the Materials Testing Lab. of the Martin Co., Baltimore, Md. Since 1963, he has been a member of the Applied Physics Group, Surface Division, Westinghouse Defense and Space Center, Baltimore, Md., where he has been actively engaged in the research and development of numerous microwave components.

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Yoshihiro Konishi (A'61–SM'65) was born on September 24, 1928 in Nara, Japan. He received the Bachelor's Degree and the Doctor of Engineering Degree from Kyoto University, Japan, in 1951, and 1961, respectively.

He joined Nippon Hoso Kyokai, (Japan Broadcasting Corporation), Tokyo, in 1951. Since 1952, he has worked at their Technical Research Laboratories, where he has been engaged in research and development of VHF and UHF circuits and components. From 1962 to 1963, he was at the Microwave Research Institute of the Polytechnic Institute of Brooklyn, N. Y. At present he is a Senior Staff Member at NHK Technical Research Labs., working on ferrimagnetic and solid state circuits.

Dr. Konishi is a Member of the Institute of Electrical Communication Engineering of Japan.

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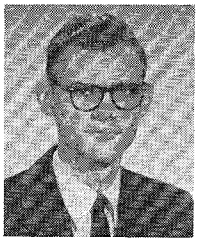

Kenneth L. Kotzebue (S'56–M'59) was born in San Antonio, Tex., on December 4, 1933. He received the B.S. degree in mechanical engineering from the University of Texas, Austin, in 1954, the M.S. degree in engineering from the University of California at Los Angeles in 1956, and the Ph.D. degree in electrical engineering from Stanford University, Stanford, Calif., in 1959.

From 1954–1956 he was a member of the technical staff of Hughes Aircraft Company, Los Angeles, Calif., while a participant in the Master's Cooperative Program at U.C.L.A. He was a Research Assistant at Stanford University for two years, working in the field of solid-state parametric amplifiers. In 1958 he joined Texas Instruments Incorporated, Dallas, Tex., where he worked in the field of parametric amplifiers and harmonic generators. In 1959 he became associated with Watkins-Johnson Company, Palo Alto, Calif., and was engaged in research and development of solid-state microwave devices. Since 1964 he has been a member of the faculty of the University of California at Santa Barbara where he is currently Associate Professor of Electrical Engineering.

Dr. Kotzebue is a member of Tau Beta Pi and Sigma Xi.

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Louis J. Lavedan (M'58) was born in New Orleans, La., on November 20, 1933. He received the B.S. degree in physics from Lyola University of the South, New Orleans in 1954, and the M.S. degree in physics from Louisiana State University, Baton Rouge, in 1956.

From 1956 to 1962 he was employed by the Radio Corporation of America, Moorestown, N. J., in various assignments involving design and development of microwave components, specializing in super power duplexer design and high power evaluation. In 1962, he joined Sperry Microwave Electronics Company, Clearwater, Fla., where he has been engaged in design of microwave sub-systems development, ferroelectric devices, and latching-type ferrite devices.

Mr. Lavedan is a member of Sigma Pi Sigma.

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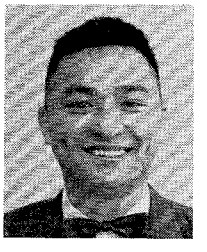
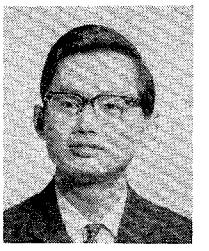


Martin J. Lee, was born in Canton, China on November 2, 1936. He entered the United States in 1952 and became a naturalized citizen in 1962. He received the B.S. degree in electrical engineering from the University of California, Berkeley, in 1960 and the M.S. degree from New York University, N. Y., in 1962.

His special field is microwave engineering; he worked as an Engineering Aide for Eitel-McCullough Inc., of San Bruno, Calif., from 1956 to 1957, and was a member of the technical staff of Bell Telephone Laboratories, Murray Hill, N. J., from 1960 to 1962. He has been a technical staff member of Stanford Linear Accelerator Center (SLAC) since 1962.



Jin-Twan Lim (S'64) was born in Rangoon, Burma, on October 29, 1936. He received the B.Sc. (Eng.) degree in electrical engineering from the University of Rangoon, Burma, in 1960.

From 1960 to 1962 he was trained as a Graduate Apprentice in electronics and telecommunications with the General Electric Company Limited of Great Britain in their laboratories at Conventry and North Wembley, England. In 1962, he joined the Electrical Engineering Department, University of Leeds, Yorkshire, England, as Demonstrator, and has been doing research for his Ph.D. degree on broadbanding of microwave amplifiers.

Mr. Lim is a graduate member of the Institution of Electrical Engineers, Great Britain.

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Richard G. Lock (M'65) was born in New York, N. Y., on April 5, 1929. He received the B.S. degree in physics from the Massachusetts Institute of Technology, Cambridge, and the M.S. degree in electrical engineering from Union College, Schenectady, N. Y., in 1951 and 1959, respectively.

In the years 1952 and 1953 he did development work on microwave duplexers at the Signal Corps Laboratories, Fort Monmouth, N. J. From 1953 to the present, he has worked on microwave crossed-field devices at the Power Tube Department General Electric Company, Schenectady, N. Y., where he is a Senior Design Engineer.

Mr. Lock is a member of Sigma Xi.

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Gregory A. Loew (S'55–M'59) was born in Vienna, Austria on July 11, 1930. He received his Licensees-Sciences in physics, mathematics, and chemistry from the University of Paris, France, in 1952. He received the M.S. degree in electrical engineering from the California Institute of Technology, Pasadena, in 1954 and his Ph.D. degrree in electrical engineering from Stanford University Stanford, Calif., in 1958.

He worked as both a Research and Teaching Assistant at the California Institute of Technology and was both a Research Assistant and Associate with the Microwave Laboratory of Stanford University. He

joined the Stanford Linear Accelerator Center (SLAC) in 1961 as a Senior Staff Member and was later named the head of the Accelerator Physics Department of SLAC.

Dr. Loew is a member of Sigma Xi.

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Dietrich Marcuse (M'58) was born in Koenigsberg, Germany, on February 27, 1929. He received the Diplom Physiker degree from the Free University of Berlin, Germany, in 1954, and the degree of Dr. Ing. from the Technische Hochschule in Karlsruhe, Germany, in 1962.

He worked for Siemens and Halske, Berlin, Germany from 1954 to 1957. He then joined the Bell Telephone Laboratories, Inc., Holmdel, N. J., where he has worked on problems of guided wave research and masers and where he is presently engaged in research on light transmission systems.

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Paul J. Meier (S'55–M'59) was born in New York, N. Y., on April 10, 1936. He received the B.E.E. degree from Manhattan College, New York, in 1958, and did graduate work at New York University until 1960.

Prior to graduation, he held engineering positions at the Navy's Bureau of Aeronautics, Washington, D.C., and the American Bosch Arma Corporation, Garden City, N. Y. In 1958 he joined the staff of Wheeler Laboratories, Inc., Great Neck, N. Y., where he worked on the design of missile-borne microwave components. Since his promotion to Senior Development Engineer in 1963, he has participated in the design of components for phased arrays and conventional radar antennas.

Mr. Meier is a member of Eta Kappa Nu.

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Barry S. Perlman (M'65) was born in Brooklyn, N. Y., on December 5, 1939. He received the B.S.E.E. degree from the College of the City of New York, N. Y., in 1961 and the M.S.E.E. degree from the Polytechnic Institute of Brooklyn, N. Y., in 1964.

In 1961 he joined the Communications Systems Division (CSD), New York Systems Laboratory, RCA, N. Y., where he was concerned with the development of wideband and low-noise parametric amplifiers and upconverters. He also developed several large signal, high-efficiency nonlinear parametric devices for an all-solid-state radio relay system. He was temporarily assigned in 1963 to Quantum Electronics Departments, RCA Laboratories, Princeton, N. J., where laser devies were designed and developed. Returning to CSD, N. Y., in late 1963, he began construction of a laser communication system designed to ascertain feasibility of a paractical coherent optical communication system. An important phase of this work was the development of wideband modulators to more effectively utilize the information capacity of the laster. His M.S. thesis was entitled "Quasi-Coherent Visual-Optical Communication." He has recently become involved in a program to develop new criteria for reducing intermodulation distortion in RF amplifiers, developing criteria for the design of broadband nonlinear reactance and other active devices, and a study of cryogenic techniques as applied to communications systems.

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Stewart M. Perlow (S'60–M'64) was born in New York, N. Y., on October 25, 1941. He received his B.E.E. degree from the College of the City of New York, N. Y., in 1963, and is currently attending the graduate division of the Polytechnic Institute of Brooklyn, Farmingdale, N. Y.

In November 1963, he joined the Advanced Solid State RF Techniques Group, Communications Systems Division (CSD), New York Systems Laboratory, RCA, N. Y. His work with parametric devices led to the development of a highly efficient field tunable solid state modulated power source in the 4.4 to 5.0-Gc/s frequency band. He has also worked on correlation techniques for rejecting unwanted signals in the HF and VHF bands and has had design experience with RC active filters. This work has produced several new filter concepts.

Mr. Perlow is a member of Eta Kappa Nu.

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John E. Pippin (S'50–M'58–SM'61) was born in Kinard, Fla., on October 7, 1927. He received the B.E.E. and M.S.E.E. degrees from Georgia Institute of Technology, Atlanta, in 1951 and 1953, respectively. He received the Ph.D. degree in applied physics from Harvard University, Cambridge, Mass. in 1958.

From 1958 to 1964 he was employed by the Sperry Microwave Electronics Company, Clearwater, Fla., where he was Research Department Head. His work was primarily concerned with the application of solid-state materials and devices in microwave components and techniques. Since August 1964, he has been employed by Scientific-Atlanta, Inc., Atlanta, where he is Vice President-Director of Research. In this position he is concerned with antenna measurements, solid-state components and techniques, and instrument development.

Dr. Pippin is a member of the American Physical Society and a member of the Administrative Committee of the Microwave Theory and Techniques Group.

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Sean O. Scanlan (M'62) was born in Dublin, Ireland, on September 20, 1937. He received the B.E. and M.E. degrees from the National University of Ireland, University College, Dublin, in 1959 and 1964, respectively.

From 1959 until 1963 he worked at the Mullard Research Laboratories, Surrey, England, on circuit problems associated with transistors and tunnel diodes, and on general network synthesis problems. In October 1963, he joined the staff of the Electrical Engineering Department, University of Leeds, Yorkshire, England, as a Lecturer, where he is continuing his research in the same fields.

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Martin V. Schneider (M'56) was born in Berne, Switzerland, on October 20, 1930. He received the M.S. degree in physics from the Swiss Federal Institute of Technology, Zurich, Switzerland, in 1955. He came to the U. S. in 1956 as a Fellow of the American Swiss Foundation and did graduate work at the State University of Iowa, Iowa City. He returned to the Swiss Federal Institute of Technology in 1957 and received the Ph.D. degree in physics in 1959.

He continued work at the Swiss Institute on properties and applications of thin films of microwave frequencies until 1961. In September, 1961, he joined Bell Telephone Labs., Inc., Holmdel, N. J., where he has been primarily engaged in solid state and thin film work at microwave frequencies. He

is presently working on various detector problems in the visible optical and in the infrared range.

Dr. Schneider is a member of The American Physical Society and The American Vacuum Society.

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Felix K. Schwering (M'60) was born in Cologne, Germany, on June 4, 1930. He studied electrical engineering at the Technische Hochschule in Aachen, Germany, where he received the Diplom-Ingenieur degree in 1954 and the Ph.D. degree in 1957.

He was an Assistant Professor at the Institute for Theoretical Physics in Aachen from 1955 to 1958. In 1958 he joined the U. S. Army Electronics Lab. in Fort Monmouth, N. J., where he worked as a physicist in the field of Electromagnetic Theory. From 1961 to 1964 he was with Telefunken in Ulm, Germany, where he was engaged in radar propagation studies. In 1964 he returned to the U. S. Army Electronics Lab. in Fort Monmouth. His work is concerned with electromagnetic wave propagation, in particular with the theory of beam waveguides and wavebeam resonators.

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A. L. Stanford was born in Macon, Ga., on January 20, 1931. He received the B.S. degree in physics from the Georgia Institute of Technology, Atlanta, in 1952. He entered the U. S. Navy in 1952 and served as a radar instructor until 1956. From 1956 until 1958 he carried out graduate studies at the Georgia Institute of Technology where he held various research and teaching assistantships, receiving the M.S. degree in physics in 1957 and the Ph.D. degree in physics in 1958.

In 1958, he joined the Applied Physics Section of the Sperry Microwave Electronics Company, Clearwater, Fla., where he was engaged in studies and research on parametric amplifiers, ferroelectric materials, measurements of microwave properties of ferroelectric materials, and the application of ferroelectric materials to microwave devices and techniques. While at Sperry he was responsible for advanced studies of ferroelectric materials for use at microwave frequencies. He is currently teaching and conducting research studies at the Georgia Institute of Technology.

Dr. Stanford is a member of Sigma Pi Sigma, Sigma Xi, and the American Physical Society.

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William H. Steier (S'58–M'60) was born in Kendallville, Ind., on May 25, 1933. He received the B.S. degree in electronic engineering from Evansville College, Ind., in 1955, and the M.S. and Ph.D. degrees, both in electrical engineering, from the University of Illinois, Urbana, in 1957 and 1960, respectively.

From 1960 until 1962 he was on the faculty of the Electrical Engineering Department at Illinois. Since 1962 he has been a member of the Technical Staff of Bell Telephone Labs., Crawford Hill, N. J. While on the faculty at Illinois, he was a consultant to Ramo-Wooldridge Research Labs. and Space Technology Labs., Los Angeles, Calif. He has done research in millimeter-wave transmission, detection, and generation, and is currently working in optics.

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Fred Sterzer (M'56) was born in Vienna, Austria, on November 18, 1929. He received the B.S. degree in physics from the College of the City of New York, N. Y., and the M.S. and Ph.D. degrees in physics from New York University in 1951, 1952, and 1955, respectively.

From 1952 to 1953 he was employed by the Allied Control Corp., New York. 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 the RCA Tube Division, Harrison, N. J., in October 1954 and transferred to the Princeton, N. J., branch in 1956, where he is now Manager of the Microwave Applied Research Laboratory. His work has been in the field of microwave spectroscopy, microwave tubes, solid-state microwave amplifiers, frequency converters and power sources, microwave computing circuits, and light modulators and demodulators.

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

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Herbert L. Thal, Jr. (A'53–M'58) was born in Mount Vernon, N. Y., on February 15, 1932. He received the B.E.E., M.E.E., and Ph.D. degrees in electrical engineering from Rensselaer Polytechnic Institute, Troy, N. Y. in 1953, 1955, and 1962, respectively.

From 1953 to 1956, he was a Research Associate at Rensselaer Polytechnic Institute working RF-interference measuring techniques. Since 1956 he has been at the Power Tube Department, General Electric Company, Schenectady, N. Y., where he has performed research and development on circuits and beam interactions in fixed-frequency and voltage-tunable magnetrons, multiple-beam klystrons, and distributed amplifiers.

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

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Eugene N. Torgow, (S'48–A'49–SM'54) for photograph and biography see page 720 of the September 1965 issue of these TRANSACTIONS.

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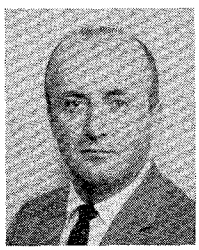

Charles S. Ward was born in Syracuse, N. Y., on February 11, 1929. He received the A.B. degree in physics from Syracuse University, Syracuse, N. Y., in 1951, where he held a full tuition scholarship. After one year with RCA and two years military service, he attended the University of Pennsylvania, Philadelphia, Pa., where he received the M.S. degree in physics in 1957. At Pennsylvania he held an appointment as Research Assistant. He received the M.S. degree in physics from the Massachusetts Institute of Technology, Cambridge, Mass. in 1959. At M.I.T. he held appointments both as a Teaching Assistant in physics and Research Assistant in the Research Laboratory of Electronics.

In 1960 he joined the research staff at Microwave Associates, Inc., Burlington, Mass., where he has been concerned with problems associated with high power gas charges in microwave duplexers.

Mr. Ward is a member of the American Physical Society.

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Lawrence R. Whicker (M'60) was born in Bristol, Va., on October 3, 1934. He received the B.S. and M.S. degrees from the University of Tennessee, Knoxville, and the Ph.D. degree from Purdue University, Lafayette, Ind., all in electrical engineering, in 1957, 1958, and 1964, respectively.

From 1958 to 1961 he was a Senior Engineer with the Sperry Microwave Electronics Co., Clearwater, Fla., where he was con-

cerned with the design of microwave filters and solid state millimeter wavelength components. From 1961 to 1964 he held a Ford Foundation Fellowship at Purdue University, where he conducted research in the areas of coupled mode theory and microwave energy transmission in a dispersive media. In January, 1964, he joined the Surface Division of the Westinghouse Electric Corp., Baltimore, Md., as a Fellow Engineer, where he has worked in the areas of latching ferrite devices and microwave ultrasonics. Presently, he is Associate Director for Applied Physics, responsible for new developments in the areas of microwave, plasma, and solid-state physics. Concurrent with his industrial endeavors he is a lecturer at the University of Maryland, College Park, where he teaches courses in the areas of circuits and field theory.

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

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Colin B. Williams was born in Wales. He received the B.S. and the Ph.D. degrees in engineering from the University of Sheffield, England.

From 1958 until 1960, when he became a staff member of the Stanford Linear Accelerator Center (SLAC), Dr. Williams was a Research Associate of the Microwave Laboratory of Stanford University. In 1964 he was granted a two-year leave of absence from SLAC to work as a staff member of the Laboratoire de L'Accelerateur Lineaire in Orsay, France. His special fields are high power traveling wave tubes and linear electron accelerators.

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A. R. Wilmunder was born in Sacramento, Calif., on May 11, 1928. He received the B.S. degree from Stanford University in 1953.

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