

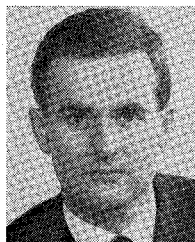
## Contributors



**C. Leonard Bennett, Jr.** (S'59-M'68) was born in Pepperell, Mass., on October 5, 1939. He received the B.S.E.E. degree from Lowell Technological Institute, Lowell, Mass., the M.S. degree from North Carolina State University, Raleigh, and the Ph.D. degree from Purdue University, Lafayette, Ind., in 1961, 1964, and 1968, respectively.

He served as a Teaching Assistant at North Carolina State University from 1961 to 1964 and as an Instructor at Purdue University from 1964 to 1968. During 1968 he was a Research Engineer in the Millimeter Wave Research Laboratory, Purdue University. Since November 1968, he has been a Research Staff Member at the Sperry Rand Research Center, Sudbury, Mass., where he is engaged in the experimental and theoretical study of transient electromagnetic scattering problems, with emphasis on integral equation techniques.

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



**Dietrich E. Bergfried** (M'68) was born in Berlin, Germany, on July 10, 1939. He received the Diplom Ingenieur degree in electrical engineering from the Institute of Technology, Munich, Germany, in 1966 and is presently working on the Ph.D. in electrical engineering at the George Washington University, Washington, D. C.

Since joining Weinschel Engineering Company, Inc., Gaithersburg, Md., in 1967, he has been engaged in the design and development of coaxial microwave components as well as microwave measurement instruments, and in particular, RF pulse measuring equipment.

opment of coaxial microwave components as well as microwave measurement instruments, and in particular, RF pulse measuring equipment.



**Blake E. Cherrington** (S'63-M'65) was born in Belleville, Ont., Canada, on March 16, 1937. He received the degrees of B.A.Sc. with honors and M.A.Sc. in electrical engineering from the University of Toronto, Toronto, Canada, in 1959 and 1961, respectively. In the fall of 1961 he entered the Graduate College of the University of Illinois, Urbana, with a Ford Foundation Teaching Intern Fellowship, and in 1965 received the Ph.D. degree in electrical engineering.

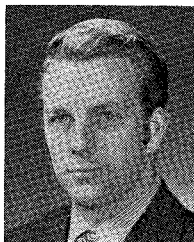
In the summer of 1962 he entered the Gaseous Electronics Laboratory of the University of Illinois, where he is presently an Assistant Professor of Electrical Engineering. He is active in the fields of quantum electronics, gaseous electronics, and plasma physics, and has published several papers, in these fields. He is presently co-director of two research projects on plasma physics and gas lasers.

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



**Charles H. Dale** (S'57-M'59) was born in Livingston, Tenn., on June 15, 1932. He received the B.E. degree in electrical engineering from Vanderbilt University, Nashville, Tenn. in 1958, and has done graduate work at the University of Colorado, Boulder, Colo.

From 1958 until 1966 he was employed by Sperry Microwave Electronics Company in Clearwater, Fla. As a Senior Staff Engineer, he was involved in the design and development of commercial test equipment and microwave components for numerous military programs. In 1966 he joined LTV Electrosystems, Inc., in Garland, Tex., and worked as an Engineering Specialist in the Electronic Warfare Department until 1970. Since 1970 he has been employed by Texas Instruments, Inc., Dallas, Tex., where he is involved in automatic test equipment design.



**Robert E. DeBrecht** (M'69) was born in Orange County, Calif., on April 11, 1944. He received the Bachelor's degree in engineering physics in 1966 and the Master's degree in electrical engineering in 1968, both from the University of California, Berkeley, Calif.

He joined RCA Laboratories in 1968 where he worked on the design and fabrication of integrated circuits. In 1969 he joined the Microwave Integrated Circuits Group working on the measurement of microwave integrated-circuit lumped elements. Recently he has begun work on a GaAs Schottky-barrier FET.

rated-circuit lumped elements. Recently he has begun work on a GaAs Schottky-barrier FET.



**Jakob Dijk** was born in Groningen, The Netherlands, on March 2, 1935. He received the B.E.E. degree in electrical engineering from the Minerva Academy, Groningen, in 1955, and the Ir. degree (equivalent to the M.Sc. degree) in electrical engineering from the Eindhoven University of Technology, Eindhoven, The Netherlands, working on parametrical amplifiers, in 1963.

From 1955 to 1959 he was with the Dutch Air Force as a Communication Officer responsible for communication and radar equipment at the Eindhoven air base. In 1961 he joined the Eindhoven University of Technology, where he was engaged in problems of solid-state physics. Since 1965 he has worked on satellite communication, especially with regard to antennas and propagation. From 1965 to 1967 he was engaged with the initial electrical design of the antenna for the Dutch ground station for satellite communication, now under construction. He was also a consultant for the noise measurement of the radome protected SHAPE antenna system in The Hague. Now he is a Senior Staff Member of the Eindhoven University of Technology, working on satellite

communication projects above 10 GHz, and will participate in the Italian SIRIO project. He is also working together with the University of Surabaya, Surabaya, Indonesia, on propagation of centimeter waves in tropical climates. He is a Lecturer in electronics with the Institute for Higher Technology in Eindhoven. He has written over ten papers on antennas, antenna noise, and pulse compression for radar systems.

Mr. Dijk is a member of the Dutch Radio Society (NERG).



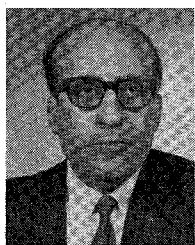
**Michael E. Fein** (S'64-M'69), photograph and biography not available at the time of publication.



**Robert V. Garver** (M'57-SM'68) was born in Minneapolis, Minn., on June 2, 1932. He received the A.B. degree in physics from the University of Maryland, College Park, in 1956 and the M.E.A. degree in engineering administration from George Washington University, Washington, D. C.

Since 1956 he has been affiliated with the Microwave Branch at the Harry Diamond Laboratories (formerly Diamond Ordnance Fuze Laboratories), U. S. Army Materiel

Command, Washington, D. C. His work has been on microwave semiconductor diode switches, limiters, and phase modulators.



**M. A. K. Hamid** (S'60-M'66-SM'71) was born on June 7, 1934. He received the B.Eng. and M.Eng. degrees from McGill University, Montreal, Quebec, Canada, and the Ph.D. degree from the University of Toronto, Toronto, Ont., Canada, all in electrical engineering.

In 1960 he was a Planning Engineer with the Aluminum Company of Canada in Montreal. From 1963 to 1965 he was a Senior Consulting Engineer with the Satellite

Antennas Design Group at Sinclair Radio Laboratories in Toronto. Since 1965 he has been with the Department of Electrical Engineering at the University of Manitoba, Winnipeg, Man., Canada, where he served as an Assistant Professor and an Associate Professor and where he is now a Professor of Electrical Engineering and Adjunct Professor of Agricultural Engineering. His interests are in electromagnetic engineering, including antennas, diffraction, scattering, inverse scattering, propagation, microwave circuits, devices and instrumentation, as well as the biological and industrial applications of ultrasonics and microwaves.

Dr. Hamid has been a Member of the Board of Governors of the International Microwave Power Institute since 1969 and President since 1971, Session Chairman at the 1970 International Symposium on Microwave Power, The Hague, The Netherlands, and General Chairman of the 1971 Symposium on Microwave Power in Monterey, California. He was also Chairman of the conference on Biological Effects of Ultrasound and Microwaves held at the University of Manitoba in March 1970. He has also been a member of the Manitoba Research Council since 1971, an Associate Editor of the *Journal*

of *Microwave Power* since 1969, and Member of the editorial boards of the *Microwave Journal*, the IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION and the IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES since 1968. He is a member of various Canadian delegations to international organizations.



**A. Ray Howland** (S'59-M'62) was born in LaGrange, Ga., on February 25, 1934. He attended Rice University, Houston, Tex., and received the B.E.E. from George Washington University, Washington, D. C. in 1960, and the M.S. from Cornell University, Ithaca, N. Y. in 1963.

From 1959 to 1964 he was engaged in research and development programs related to electromagnetic compatibility in the microwave region at Jansky & Bailey. Also from

1960 to 1963 he was engaged in the development of high-power multicavity klystrons with low spurious signal levels. He joined Cornell Aeronautical Laboratory, Buffalo, N. Y. in 1964, where he conducted electron-beam device studies and studied microwave measurement system requirements. Since 1965 he has been a Senior Engineer with Scientific-Atlanta, Atlanta, Ga., where his primary area of interest and responsibility is in the design, development, and utilization of microwave measurement techniques and calibration procedures. He is the author of numerous technical papers.

Mr. Howland is a member of the IEEE Microwave Theory and Techniques Group, Instrumentation and Measurement Group, and Electron Devices Group. He is also a member of Precision Measurement Association, Theta Tau, and Sigma Tau.



**Avinash C. Kak** (M'71) was born in Srinager, Kashmir, India, on October 22, 1944. He received the B.E. degree with Honors in electronics and communications engineering from Madras University, Madras, India, in 1966, and the Ph.D. degree in electrical engineering from the Indian Institute of Technology, Delhi, India, in 1970.

Since 1970 he has been with the faculty of the School of Electrical Engineering at Purdue University, Lafayette, Ind. He has published

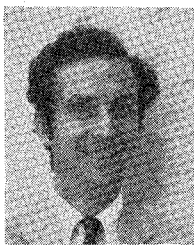
papers in the areas of planar aperture radiation, electron-density determination in the ionosphere, charge-dynamics in conductors, and Gunn-effect and acoustoelectric interactions in semiconductors. His current research interests include acoustoelectric and acoustooptic interactions in piezoelectric crystals. Currently, he is also contributing to the development of the Medical Engineering program at Purdue University.

Dr. Kak is a member of Sigma Xi.



**Corstiaan Kramer** was born in Klundert, The Netherlands, on September 15, 1943. He received the Ir. degree (equivalent to the M.Sc. degree) at Eindhoven University of Technology, Eindhoven, The Netherlands, in 1971.

He worked at the Eindhoven University of Technology, as a Research Assistant on problems concerning computer software and in the area of computer-aided antenna design. He is now a Consulting Engineer at Holland Data-plan N. V. in Amsterdam, The Netherlands.



**David Lamensdorf** (S'66-M'67) was born in New York, N. Y., on November 22, 1937. He received the B.E.E. degree from Cornell University, Ithaca, N. Y., in 1960, and the S.M. and Ph.D. degrees in applied physics from Harvard University, Cambridge, Mass., in 1961 and 1967, respectively.

Since 1967, he has been a Research Staff Member of the Sperry Rand Research Center, Sudbury, Mass.

Dr. Lamensdorf is a member of Eta Kappa

Nu and Sigma Xi.



**G. Antonio Mastellari** was born in Bologna, Italy, on February 9, 1943. He received the Dott. Ing. degree in electronics from the University of Bologna, Bologna, Italy, in 1967.

He joined the staff of Centro Onde Metriche di Bordoni Foundation in 1967, and has since been engaged in applied research and development of the first Italian millimetric waveguide transmission system, with particular regard to measurement setups and techniques and component design. Since 1971

he has been a Lecturer at the University of Bologna in the field of circuit theory.

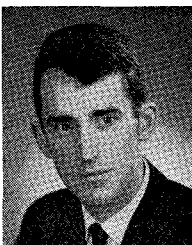


**Eduard J. Maanders** (SM'71) was born in Eindhoven, The Netherlands, on January 7, 1924. He received the Ir. degree (equivalent to the M.Sc. degree) in electrical engineering from Delft University of Technology, Delft, The Netherlands, in 1958.

He was on active military service from 1944-1948, after which he joined Philips Industries in Eindhoven. Until 1961 he was engaged with the development and manufacture of capacitors and inductors for radio engineering and with the application of ferrites for telecommunications and antennas.

From 1961 to 1963 he was engaged with the development of TV-antennas and CATV systems. In 1963 he joined Eindhoven University of Technology, Eindhoven, as a Senior Staff Member, starting with ionospheric scatter communication and antennas. From 1965-1967 he contributed to the initial electrical design of the antenna for the Dutch ground station for satellite communication. At the present time he works on reflector antenna systems and on satellite communication above 10 GHz, and will participate in the Italian SIRIO project. He is also working with the University of Surabaya, Surabaya, Indonesia, on propagation of centimeter waves in tropical climates. He has been a lecturer at several institutes of higher technology in telecommunications. He has written over 10 papers on antennas, ferrite applications, antenna noise, and scatter from meteors.

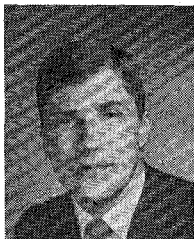
Mr. Maanders is a member of the Dutch Radio Society (NERG) and the Institute of Dutch Engineers (KIVI).



**A. Murray Nicolson** (M'64) was born in Edinburgh, Scotland, on December 21, 1938. He received the B.Sc. and Ph.D. degrees in electrical engineering from the University of Edinburgh, Edinburgh, Scotland, in 1959 and 1966, respectively.

He was employed from 1959 to 1961 as a Scientific Officer at the Royal Radar Establishment, Great Malvern, England, where he was engaged in research on radar MTI techniques and microwave antennas. He served as

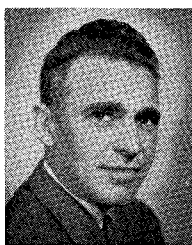
Assistant Lecturer from 1961 to 1964, and as Lecturer from 1964 to 1965, in the Department of Electrical Engineering, University of Edinburgh, where he undertook research on microwave scattering from a high-vacuum arc column. After a period with the General Electric Company, Philadelphia, Pa., he joined the Sperry Rand Research Center, Sudbury, Mass., as a member of the Research Staff, and is currently engaged in research in the field of picosecond technology in the Systems Requirements and Applications Laboratory. In 1971 he returned to the Royal Radar Establishment, where he is currently a Senior Scientific Officer.



**H. Dean McKay** (M'67) received the B.S. degree in mathematics from University of Texas at Arlington in 1964, and the M.S. degree in electrical engineering from Florida Institute of Technology in 1968.

He has eleven years' experience in the fields of electromagnetic compatibility and electromagnetic interference, testing, analysis, and prediction. Presently, he is Government Marketing Manager for Electro-Metrics Corp., part of the newly formed Federal Sys-

tems Group, Space and Defense Systems Division, Fairchild Camera and Instrument Corp.



**Samuel J. Raff** (SM'65) was born in New York, N. Y., on November 4, 1920. He received the B.S.M.E. degree at the City College of New York, N. Y., in 1944, the M.Sc. degree in physics in 1950, and the Ph.D. degree in nuclear physics in 1957, both from the University of Maryland, College Park.

He has performed research at the California Institute of Technology, Pasadena, lectured in nuclear physics for the University of Maryland and in electrical engineering for

the Massachusetts Institute of Technology, Cambridge, and has instructed in radar at George Washington University, Washington, D. C. He has served as Chief of the Nuclear Physics Department of the U. S. Naval Ordnance Laboratory; Technical Director of the Missile Office at the Navy Bureau of Weapons; and Director of the Systems Analysis Group of the Undersea Warfare Research and Development Planning Council. Since 1952 he has been a consultant at Weinschel Engineering, Gaithersburg, Md., and at present he is President of his own research company. He has had over 20 years' experience in the fields of electricity and magnetism, ordnance nuclear physics, electronic engineering, and analysis, and has authored many technical papers.

Dr. Raff is a member of the American Physical Society, the Acoustical Society of America, and the Operations Research Society of America.



**Maria A. Rzepecka (M'71)** was born in Warsaw, Poland, on April 8, 1939. She received the M.S. degree in Electrical Engineering from Warsaw Technical University in 1962 and the D.Sc. degree from the Polish Academy of Sciences, Warsaw, in 1970.

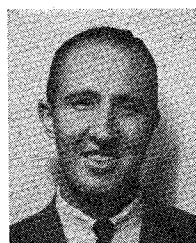
From 1962 to 1964 she was an Assistant Professor at Warsaw Technical University working on frequency stabilization of microwave oscillators. In 1964 she joined Unipan-Scientific Instruments (a subsidiary of the Polish Academy of Sciences) as a Senior Research and Development Engineer. There she was engaged in microwave laboratory instrumentation and measurements with a special interest in ferrites and microwaves for measuring nonelectrical quantities. Since 1970 she has been at the University of Manitoba, Winnipeg, Canada, as a Post-Doctoral Fellow and is involved in microwave properties of materials as well as basic research and industrial applications in the field of microwave power.



**Max J. Schindler (SM'60)** received the M.S. degree in electronic engineering and the degree of Doctor of Technical Sciences in solid-state physics, in 1951 and 1953, respectively, both from the Technische Hochschule, Vienna, Austria.

In 1958 he joined the RCA Microwave Tube Operations and has since worked on a number of basic technical problems related to the design of traveling-wave tubes, magnetrons, crossed-field devices, and solid-state devices. During his assignment to the Chemistry and Physics Laboratory from 1958 to 1962, his major contributions included improvements in the design of periodic-permanent-magnet focusing structures for traveling-wave tubes and the study of thin magnetic films. For a year and a half following this assignment, he acted as Group Leader of the Magnetron Design Group, where his major work was with the development of a hydraulically tuned magnetron. From 1963 to 1967 he led groups working on the design and development of high-efficiency and recirculating TWTs. He joined the Microwave Applied Research Laboratory, David Sarnoff Research Center, Princeton, N. J., in September 1967, where he worked for two years on crossed-field delay devices and computer techniques for Microwave Research and Development. In 1970 he was transferred to the Solid-State Design Group in Harrison, where he was assigned to the development of components for an ultra-reliable, portable X-band radar system. These included cascaded circulators and isolators as well as a unique switch which provides 80 dB of isolation, all in microstrip configuration. After production transfer of this subsystem, he began work on transferred electron amplifiers in both coaxial and microstrip configurations. A circuit-analysis computer program with self-optimization capability which he developed is widely used in this and other solid-state projects.

Dr. Schindler has published many articles pertaining to magnetics and microwave devices. He has also presented a number of papers and holds three patents. He is listed in American Men of Science.



**Laverne A. Schlie (S'67-M'67)** was born in Rockford, Ill., on January 23, 1943. He received the B.S. and M.S. degrees in electrical engineering from the University of Illinois, Urbana, in 1965 and 1966, respectively. Presently, he is working on his Ph.D. degree in the Gaseous Electronics Laboratory at the University of Illinois, where his research is concerned with plasma physics and quantum electronics.

During the summer of 1966, he worked for

Autonetics NAA at Anaheim, Calif., on various applications of solid-state lasers.

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



**Carlo Giacomo Someda (S'63-M'66)** was born in Padua, Italy, on July 20, 1941. He received the Dott. Ing. degree in electronics from the University of Padua, Padua, Italy, in 1964; the M.S.E.E. degree from Stanford University, Stanford, Calif., in 1966 under the 1965-1966 Volta Fellowship of the Volta Foundation of the IEEE; the "Libera Docenza" degree from Ministero P.I., Rome, Italy, in 1971.

From 1965 to 1968 he was an Assistant at the School of Engineering of the University of Trieste, Italy. In 1968 he joined the faculty of the University of Bologna, Bologna, Italy, where he is presently an Assistant Professor, lecturing in the area of electromagnetic fields and microwaves. His previous research interests have been in microwave and optical propagation in anisotropic and nonlinear media. Presently, he is engaged in the Italian program for research and development of a millimeter waveguide communication system.

Dr. Someda is a member of the Italian Association of Electrical and Electronic Engineers (AEI) and the Italian Physical Society (SIF).



**Leon Susman (S'56-M'58)** was born in Brooklyn, N. Y., on October 10, 1936. He received the B.S.E.E. and M.S.E.E. degrees from the City College of New York, New York, and the Ph.D. degree from the Polytechnic Institute of Brooklyn, Brooklyn, N. Y., in 1958, 1962, and 1969, respectively.

In 1958 he joined the Applied Electronics Department, Airborne Instrument Laboratory, Melville, Long Island, N. Y., where he did research and development work in the areas of radiometry and low-noise amplifiers. In 1961 he joined the Advanced Radar Techniques group at the Sperry Gyroscope Co., Great Neck, N. Y., where he undertook research in the area of broadband techniques for high-resolution radars. Much of the initial work on impulse-response techniques for antenna analysis was conducted there. In 1968 he joined the Sperry Rand Research Center, where he is currently a Research Staff Member engaged in the development of sensor techniques for various industrial applications.

Dr. Susman is a member of Tau Beta Pi, Eta Kappa Nu, and several IEEE professional groups.



**Arthur Uhler, Jr. (A'53-SM'58-F'67)** was born in Chicago, Ill., on February 2, 1926. He received the B.S. and M.S. degrees in chemical engineering from Illinois Institute of Technology, Chicago, in 1948, and the M.S. and Ph.D. degrees in physics from the University of Chicago, Chicago, Ill., in 1950 and 1952, respectively.

From 1951 to 1958, he was a member of the technical staff at Bell Telephone Labs., Murray Hill, N. J. He was Manager at

Microwave Associates, Inc., Burlington, Mass., from 1958 to 1969. He is Chairman of the Electrical Engineering Department at Tufts University, Medford, Mass., and a member of the Board of Directors of Computer Metrics, Inc., Rochelle Park, N. J.

Dr. Uhlir is a member of the American Physical Society, AAAS, Sigma Xi, and Eta Kappa Nu.

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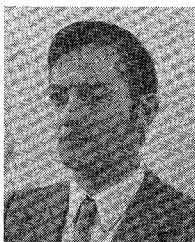


**Francesco Valdoni** (S'61-M'66) was born in Rome, Italy, on January 13, 1938. He received the Dott. Ing. degree in electronics from the University of Rome, Rome, Italy, in 1962; a subsequent degree in telecommunication systems from the Scuola Superiore di Telegrafia e Telefonia of the Istituto Superiore delle Poste e Telecomunicazioni, Rome, Italy, in 1964; the "Libera Docenza" degree from Ministero P.I., Rome, Italy, in 1971.

He did research in the microwave field at Fondazione Ugo Bordoni, Rome, until 1969, when he became an Assistant Professor at the University of Bologna, Bologna, Italy, where he is now lecturing on Radio Science and doing research on millimetric waveguide transmission systems.

Dr. Valdoni is a member of the Italian Association of Electrical and Electronic Engineers (AEI).

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**Adriaan C. A. van der Vorst** was born in Eindhoven, The Netherlands, on July 31, 1937. He received the B.E.E. degree from the Institute for Higher Technology, Eindhoven, in 1959.

He joined the Eindhoven University of Technology, Eindhoven, in 1961 as a staff member, where he became engaged with microwave engineering. Since 1965 he has worked in the field of satellite communications, especially on antennas and propagation. He has been engaged in research and development in the area of antenna systems and microwave noise measurements.

He was a Consultant for the noise measurement of the radome protected SHAPE antenna system in The Hague. He is currently working on the management and system engineering for the Italian satellite project SIRIO, in which Eindhoven University of Technology will participate.



**Joseph T. Verdeyen** (S'59-M'63) was born in Terre Haute, Ind., on August 15, 1932. He received the B.S. degree in electrical engineering from Rose Polytechnic Institute, Terre Haute, Ind., in June, 1954, the M.S. degree in electrical engineering from Rutgers University, New Brunswick, N. J., in June, 1958, and the Ph.D. degree in the field of gaseous electronics and plasma from the University of Illinois, Urbana, in June, 1962.

In 1954 he joined the Bell Telephone Laboratories, Inc., Murray Hill, N. J., where he participated in their Communications Development Training Program. In July 1955 he started his two-year tour of active duty in the Signal Corps at Fort Monmouth, N. J., as a Second Lieutenant. After his discharge from the Army in July 1957, he returned to Bell Telephone Laboratories for the remainder of the summer, and then joined the Department of Electrical Engineering, Rutgers University, as an Assistant Instructor. In 1958 he joined the Department of Electrical Engineering, University of Illinois, where he is presently an Associate Professor, dividing his time between teaching and research on gas lasers and plasmas.

Dr. Verdeyen is a member of Tau Beta Pi, Sigma Xi, and the American Physical Society.

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**Bruno O. Weinschel** (A'45-M'47-SM'53-F'66) was born in Stuttgart, Germany, on May 26, 1919. He studied physics at the Technische Hochschule, Stuttgart, and received the Ph.D. degree in engineering from the Technische Hochschule, Munich, in 1966.

He has been Chief Engineer of the Industrial Instruments Company, Senior Engineer in the Electrical Test Planning Department, Western Electric, and a Research Worker at the National Bureau of Standards. Since 1952

he has been President of Weinschel Engineering Company, Inc., Gaithersburg, Md. He has contributed to the state of the art of insertion-loss microwave measurement.

Dr. Weinschel was Chairman of U. S. Commission I of the International Scientific Radio Union (URSI) for 1967-1970.