

## Contributors



**John P. Agrios** (M'63) was born in Summit, N. J., on January 9, 1930. He received the B.E.E. and M.E.E. degrees from New York University, New York, in 1952 and 1968, respectively.

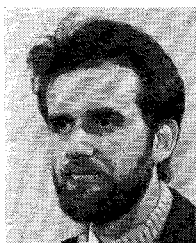
In 1954 he joined the U. S. Army Electronics Command, Fort Monmouth, N. J., and until 1962 he was engaged in research and development activities on RF and pulse cables. Since 1962 he has been concerned with research and development activities in microwave filters and ferrite devices. He is presently the Chief of the Microwave Devices Section of the Electronic Components Laboratory.



**Gary D. Alley** was born in Kansas City, Mo., on August 12, 1943. He received the B.S. and M.S. degrees in electrical engineering from the University of Kansas, Lawrence, in 1966 and 1967, respectively.

In 1967 he joined Bell Telephone Laboratories, Whippany, N. J., as a Member of the Technical Staff where he has been engaged in the design of thin-film microwave integrated circuits. Since June, 1970, he has been on a leave of absence, pursuing graduate studies leading to the Ph.D. degree in electrical engineering at the University of Kansas, where he holds an NSF Traineeship.

Mr. Alley is a member of Tau Beta Pi and Eta Kappa Nu.



**John W. Bandler** (S'66-M'66) was born in Jerusalem, Palestine, on November 9, 1941. He received the B.Sc. (Eng) degree in electrical engineering from the University of London, Imperial College of Science and Technology, London, England, in 1963 and the Ph.D. degree from the University of London concurrently with the Diploma of Imperial College in 1967.

From 1963 to 1966 he held a Research Studentship from the Science Research Council at the Imperial College. His work in the Department of Electrical Engineering concerned the stability and optimization of microwave tunnel diode amplifiers. He joined the Microwave Diode Applications Group, Mullard Research Laboratories, Redhill, Surrey, England, in 1966 and continued with research in the same field and with diode measurements. From 1967 to 1969 he was a Postdoctorate Fellow at the University of Manitoba, Winnipeg, Canada. He was with the Numerical Applications Group in the Department of Electrical Engineering working on computer-aided optimization methods and their application to network design. As a Sessional Lecturer from 1967 to 1969 he also lectured on microwave circuits and optimization methods for computer-aided design. He is now an Assistant Professor with the Department of Electrical Engineering at McMaster University, Hamilton, Ont., Canada. He is also an Associate Member of the Department of Applied Mathematics at the University. He is currently lecturing and carrying out research in the areas of circuit theory, computer-aided design, and numerical optimization methods.

Dr. Bandler is an Associate of the City and Guilds of London Institute and an associate member of the Institution of Electrical Engineers. He is currently an Associate Editor of the IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES.



**Clare E. Barnes** (M'69) was born in Vassar, Mich., on October 24, 1929. He received the B.S. degree in physics from Michigan State University, East Lansing, Mich., in 1956.

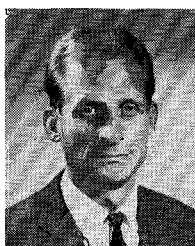
In 1956 he attended Bell Telephone Laboratories' Communications Development Training Program. With the exception of a brief period in phased-array radar systems development at Bell Telephone Laboratories, Whippany, N. J., his work has been primarily in the area of low-power ferrite devices and microwave integrated circuits development in the frequency range from 250 MHz to 110 GHz. He is currently Supervisor of a group involved in the development of millimeter-wave ferrite devices and microwave photo-processed lumped-element circulators.



**Marcel J. Beaubien** was born in Winnipeg, Man., Canada, on March 13, 1941. He received the B.Sc., M.Sc., and Ph.D. degrees, in 1964, 1966, and 1970, respectively.

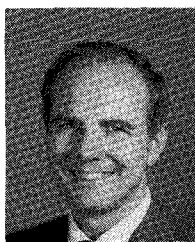
His research concerned finite-difference methods for the solution of electromagnetic field problems. In 1964 he was employed by Manitoba Hydro on terminal-station design. He was engaged in electromagnetic compatibility studies with Lockheed-Georgia in 1966.

Dr. Beaubien is Vice-President of American Consulting Association Ltd. He is a member of the Association of Professional Engineers of the Province of Manitoba.



**Fridolin Bosch** was born in Frickingen, Germany, on July 13, 1932. He received the Dipl.Ing. and Ph.D. degrees in electrical engineering from the University of Karlsruhe, Germany, in 1957 and 1964, respectively.

In 1958 he did research work on high-power tunable vacuum condensers with the English Electric Valve Company, Chelmsford, England. After that he returned to the Institute for High-Frequency Techniques and High-Frequency Physics of the University of Karlsruhe, where he attained a position corresponding to Assistant Professor. At Karlsruhe he was engaged in research on low-noise microwave amplifiers (especially traveling-wave masers) and on broad-band circulators for room and cryogenic temperatures. In 1968 he joined Bell Telephone Laboratories, Inc., Allentown, Pa., where he has been involved in the development of active and passive millimeter-wave components.

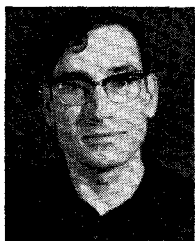


**Charles R. Boyd, Jr.** (S'52-M'58-SM'63) was born in Pittsburgh, Pa., on October 21, 1932. He received the B.S.E.E. degree from Carnegie Institute of Technology, Pittsburgh, Pa., in 1953 and the M.E.E. and Ph.D. degrees in electrical engineering from Syracuse University, Syracuse, N.Y., in 1962 and 1964, respectively. He is also a graduate of the General Electric Company's Advanced Courses in Engineering, a three-year program of part-

time graduate level studies, which he completed in 1959.

From 1953 to 1956 he was a Field Engineer with Westinghouse Electric Corporation, where he worked on developmental autopilot and side-looking radar equipment. In 1956 he joined General Electric, Utica, N. Y., where he helped design a missile transponder for the early Atlas guidance system. He transferred to the General Electric Electronics Laboratory, Syracuse, N. Y., in 1957, and carried out development of advanced microwave semiconductor and ferrite circuits. From 1961 to 1962 he was on academic leave at Syracuse University, and from 1962 to 1963 he supervised and taught a portion of the General Electric Advanced Courses in Engineering, returning in each case to active work at the General Electric Electronics Laboratory. In 1965 he joined Rantec Corporation, Calabasas, Calif., where he managed an engineering group engaged in development and design of microwave solid-state components. He was on the faculty of the University of California, Los Angeles, from 1967 to 1970. He is a co-founder of Microwave Applications Group, Chatsworth, Calif., and serves as Technical Director.

Dr. Boyd is a member of Eta Kappa Nu and is a licensed Professional Engineer in the state of New York.



**Raymond M. Bulley** (S'66-M'68) was born in Cheam, Surrey, England, on July 28, 1940. He received the B.Sc. degree in physics from University College, London, England, in 1962, the M.Sc. degree in physics from the University of London, London, in 1965, and the Ph.D. degree in electrical engineering from the University of Sheffield, England, in 1968.

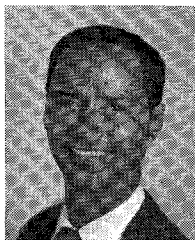
From October 1962 to January 1966 he was employed by Mullard Research Laboratories, Redhill, Surrey, where he worked on parametric amplifier development and the design of a system for the measurement of tensor permeability of ferrites at liquid helium temperatures. Since 1966 he has worked on computer techniques for the solution of waveguide problems at the Departments of Electrical Engineering of both the University of Sheffield, and McGill University, Montreal, Canada. He is now a member of the Technical Staff at Bell Telephone Laboratories, Inc., Holmdel, N. J.



**Zoltan J. Csendes** (S'67) was born in Fiferntz, Austria, on May 16, 1946. He received the B.S.E. degree from the University of Michigan, Ann Arbor, in 1968 and the M.Eng. degree from McGill University, Montreal, P. Q., Canada, in 1970.

From 1968 to 1969 he was with the Nuclear Physics Group in the Foster Radiation Laboratory, McGill University, and joined the Department of Electrical Engineering at McGill in 1969. He is currently working toward the Ph.D. degree in electrical engineering, concentrating in the field of numerical-solution methods for electromagnetic problems.

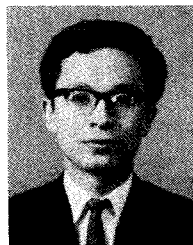
Mr. Csendes is a member of Tau Beta Pi.



**Robert W. Jansen** was born in Los Angeles, Calif., on December 5, 1930. He received the A.M.E. degree from the Los Angeles Trade Technical College in 1961. Between 1961 and 1964 he attended classes at the University of California, Los Angeles, where he completed the equivalent of one and one-half years of undergraduate engineering courses.

He was with Hughes Aircraft Company from 1953 to 1961, where his responsibilities involved material control, planning, and de-

sign engineering. From 1961 to 1967 he was with the Rantec Corporation, Calabasas, Calif. While at Rantec his experience included mechanical design engineering and the related needs of design for fabrication, assembly, and test of microwave components. In particular, he has been involved in the design of ferrite isolators, circulators, and phase shifters for well over a decade. He is cofounder of Microwave Applications Group, and serves as that corporation's Operations Manager. His present activities in this position include responsibility for the areas of mechanical design, fabrication, and planning. He is coinventor on three patents dealing with mechanisms and industrial process equipment.



**Yasuaki Kinoshita** (S'64-M'67) was born in Hokkaido, Japan, on December 10, 1936. He received the B.S., M.S., and Ph.D. degrees in electrical engineering from Hokkaido University, Sapporo, Japan, in 1959, 1964, and 1967, respectively.

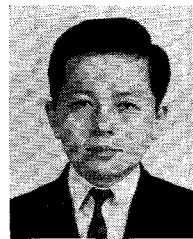
He worked with the Research Laboratory, Nippon Electric Company, Ltd., Kawasaki, from 1959 to 1962. During 1967 he was an Instructor of Electronics Engineering, Hokkaido University. He joined Central Research Laboratory, Hitachi Ltd., Tokyo, in 1968. His research work since 1962 has been on optical modulation, laser propagation, and optical communication. Since 1968 he has been engaged in the development of a millimeter-wave parametric amplifier.

Dr. Kinoshita is a member of the Institute of Electronics and Communication Engineers of Japan and the Japan Society of Applied Physics.



**Reinhard H. Knerr** was born in Pirmasens, Germany, on February 18, 1939. He received the undergraduate degree from the Technische Hochschule, Aachen, Germany in 1960, the Dipl. Ing. degree from the National College of Electrical Engineering and Hydraulics, Toulouse, France in 1962, and the Ph.D. degree from Lehigh University, Bethlehem, Pa., in 1968.

He was a Graduate Assistant, NATO-Scholar, and successively full-time Instructor in the Department of Electrical Engineering, Lehigh University, receiving the doctoral degree for his work on wave propagation in nonuniformly biased microwave ferrites. From 1963 to 1965 he was concerned with the problem of plasma oscillations in solids. He is presently a member of the Solid State Microwave Device Department of Bell Telephone Laboratories, Inc., Allentown, Pa.



**Hidetoshi Kurebayashi** was born in Shizuoka City, Japan, on January 30, 1939. He graduated from Shizuoka University, Shizuoka City, Japan in 1961.

Since 1961 he has been with the Mitsubishi Electric Corporation, Kamakura City, Kanagawa Prefecture, Japan, where he has been engaged in the research and development of microwave ferrite devices, especially circulators and phase shifters. He is now a Senior Engineer of the Electronics Laboratory, Kamakura Works, Mitsubishi Electric Corporation, Kamakura City, Japan. Recently, his major efforts have been directed toward latching devices.

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



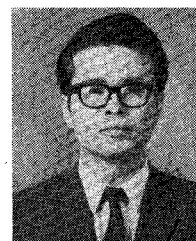
**Ralph Levy** (SM'64) was born in London, England, on April 12, 1932. He received the M.A. degree in physics from St. Catharine's College, Cambridge University, England, in 1953, and the Ph.D. degree in electrical engineering from the University of London, England, in 1966.

From 1953 to 1959, he was a member of the Scientific Staff at the Applied Electronics Laboratories of the General Electric Company, Stanmore, Middlesex, England, where he worked on guided missiles, radar, counter-measures systems, and on microwave components. In 1959 he joined Mullan Research Laboratories, Redhill, Surrey, England, where he directed a section engaged in studies on broadband receiver design, microwave components, and network synthesis. In 1964 he was appointed to the post of Lecturer in the Department of Electrical and Electronic Engineering at the University of Leeds, England, where he carried out research in the fields of microwave network synthesis and broadband microwave components, and also held positions as an Industrial Consultant. Since July, 1967, he has been associated with Microwave Development Laboratories, Natick, Mass., and is now Vice President for Research.

Dr. Levy is a member of the Institution of Electrical Engineers (London).



**Leonard Lewin** (A'69), for a photograph and biography please see page 413 of the July, 1970, issue of this TRANSACTIONS.



**Minoru Maeda** (M'70) was born in Kanagawa, Japan, on December 22, 1942. He received the B.S. and M.S. degrees in electrical engineering from Yokohama National University, Yokohama, Japan, in 1965 and 1967, respectively.

He joined Central Research Laboratory, Hitachi Ltd., Tokyo, Japan, in 1967 and has since been engaged in research and development on active antennas with tunnel diode loading and parametric amplifiers.

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



**Elio A. Mariani** (M'65) was born in Trenton, N. J., on April 13, 1937. He received the B.S.E.E. degree from Drexel University, Philadelphia, Pa., in 1960.

He has been employed by the U. S. Army Electronics Command, Fort Monmouth, N. J., since 1960. At present he is a Senior Project Engineer engaged in the research and development of microwave devices.

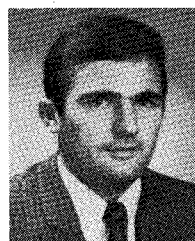


**Shojiro Nakahara** was born in Tokyo, Japan, on January 9, 1927. He graduated from the University of Tokyo, Tokyo, Japan, in 1952 and received the Dr.Eng. degree from the same university in 1962.

He joined the Mitsubishi Electric Corporation, in 1952 and is presently a Chief Engineer of the Electronics Laboratory, Kamakura Works, where he has been engaged in the research and development of

isolators, circulators, and phase shifters. Since 1964 he has also been engaged in the research and development of microwave integrated circuits and laser applications.

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



**Brian Owen** was born in Nevin, Wales, on August 22, 1941. He received the B. Tech. degree in electronics from the Welsh College of Advanced Technology, Cardiff, Wales, in 1963; and the Ph.D. degree from the University of Birmingham, Birmingham, England, in 1967.

From 1967 to 1968 he held a Post Doctoral Fellowship at the University of Birmingham, and since 1968 he has been involved in the development of millimeter-wave circulators at

Bell Telephone Laboratories, Allentown, Pa.



**Rudolph E. Seviara** (S'69) was born in Jihlava, Czechoslovakia, in 1941. He received the E.E. degree from the Czech Technical University, Prague, Czechoslovakia, in 1964.

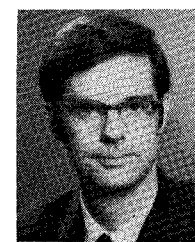
From 1964 to 1968 he was with the Institute of Radio Engineering and Electronics, Czechoslovak Academy of Sciences in Prague. He is presently completing his Ph.D. dissertation on generalized filtering in the Department of Electrical Engineering, University of Toronto, Toronto, Ont., Canada.



**P. Silvester** (S'60-M'64) was born on January 25, 1935. He received the B.S. degree in electrical engineering from the Carnegie Institute of Technology, Pittsburgh, Pa., in 1956, the M.A.Sc. degree from the University of Toronto, Toronto, Canada, in 1958, and the Ph.D. degree in electrical engineering from McGill University, Montreal, Canada, in 1964.

During 1967-1968 he spent a year at the Imperial College of Science and Technology, London, England, doing research work in numerical analysis of transmission-line conductors and waveguides. At present he is Associate Professor of Electrical Engineering at McGill University. He authored a textbook on electromagnetic fields and is currently teaching courses and conducting research in electromagnetic theory and numerical analysis. His current research interests center on the development of efficient computational algorithms for solution of electromagnetic field problems by numerical methods, with emphasis on guided-wave problems and electric power devices.

Dr. Silvester is a member of AAAS, Sigma Xi, the Tensor Society of Great Britain, and is a Registered Engineer in the Province of Quebec.



**Jerry D. Welch** (S'59-M'60) was born in Cincinnati, Ohio, on June 13, 1937. He received the S.B. and S.M. degrees from Massachusetts Institute of Technology, Cambridge, Mass., in 1959 and 1960, respectively.

From 1960 to 1962 he was with Sylvania Electronic Defense Laboratory, Mountain View, Calif., where he did transmitter circuit design and electronic countermeasures system analysis. In 1962 he joined Massachusetts In-

stitute of Technology, Lincoln Laboratory, Lexington, Mass., where he has been involved in laser diode characterization, optical radar development, microwave integrated circuit design and fabrication, basic microstrip studies and development of integrated tunnel diode amplifiers, avalanche diode analysis, and air traffic control studies.

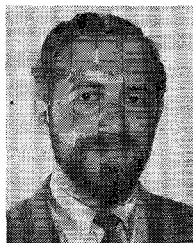
Mr. Welch is a member of Eta Kappa Nu, Tau Beta Pi, and Sigma Xi.



**Robert J. Wenzel** (S'61-M'62) was born in Milwaukee, Wis., on September 11, 1939. He received the B.S. degree in electrical engineering from Marquette University, Milwaukee, in 1961 and the M.S. degree in electrical engineering from the Massachusetts Institute of Technology, Cambridge, in 1962, under an Alfred P. Sloan Fellowship.

In 1962 he joined the Research Laboratories Division, Bendix Corporation, Southfield, Mich., where he was engaged in the development of exact synthesis techniques for distributed networks, solid-state parametric devices, and harmonic generators. Since August 1970 he has been associated with Wavecom, Inc., Northridge, Calif.

Mr. Wenzel was the winner of the 1967 Microwave Prize. He is a member of Tau Beta Pi, Eta Kappa Nu, Pi Mu Epsilon, and an associate member of Sigma Xi.



**Alvin Wexler** (S'57-M'66) was born in Winnipeg, Man., Canada, on July 14, 1935. He received the B.Sc. degree in electrical engineering from the University of Manitoba, Winnipeg, in 1958. He attended Imperial College, London, England, on an Athlone Fellowship and a Metropolitan Vickers Bursary and received the Diploma of Imperial College and a Ph.D. degree from the University of London.

His research concerned propagation in waveguides loaded with resistive films and ferrites. While in the United Kingdom, he was an Assistant Editor of *Science Abstracts* and later worked for International Computers and Tabulators Ltd., London, as a technical consultant to industry. He returned to the University of Manitoba in August, 1966, as a Ford Foundation Fellow and is now an Associate Professor there.

Dr. Wexler is a member of the Association of Professional Engineers of the Province of Manitoba and he is President of Tasc (Computing Services) Ltd. He is a member of the G-MTT Technical Committee on Computer-Aided Design of Microwave Circuits, the G-MTT Administrative Committee, and the Editorial Board.



**Lawrence R. Whicker** (M'60-SM'67) 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 with the Sperry Microwave Electronics Co., Clearwater, Fla., where he was concerned with the design of microwave filters and ferrite 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 propagation of microwave energy in a dispersive media. From 1964 to 1970, he has held various technical and management positions at the Westinghouse Defense

and Space Center, Baltimore, Md., and has been responsible for programs in latching ferrite phasers, microwave ultrasonics, and microwave integrated circuits. In 1970 he joined the Naval Research Laboratory, Washington, D. C., where he heads the Microwave-Techniques Branch of the Electronics Division. Since 1964, he has been a part-time faculty member at the University of Maryland, College Park.

Dr. Whicker is a member of Sigma Xi, Tau Beta Pi, Phi Kappa Phi, and Eta Kappa Nu. He is presently Publicity Chairman for the 1971 International Microwave Symposium.



**Albert E. Williams** (S'66-M'66) was born in Albany, Australia, on March 27, 1940. He received the B.E. degree in electrical engineering from the University of Western Australia, Nedlands, Australia, in 1962 and the Ph.D. degree from University College, London, England, in August, 1966.

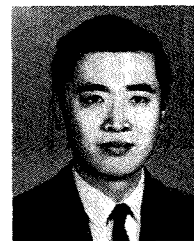
In 1966 he was a joint recipient of the IEE (London) Sylvanus P. Thompson Premium award. From 1966 to 1968 he was a Lecturer in the Department of Electrical Engineering, University of Western Australia. He is currently a Member of the Technical Staff, COMSAT Laboratories, Clarksburg, Md., where he is actively engaged in the development of lightweight filters for satellite transponders.



**O. M. Woodward** (S'38-A'40-SM'54) was born in Davis, Okla., on January 13, 1915. He received the B.S.E.E. degree from the University of Oklahoma, Norman, in 1938.

He has had 29 years of experience at RCA in antenna research and development, including radar, communication and television antennas, transmission lines, microwave components, and satellite antennas. He has received three awards from RCA Laboratories for outstanding work in research and two achievement awards from the Missile and Surface Radar Division of RCA. He has 13 technical publications and 23 issued patents on antennas and transmission-line components.

Mr. Woodward is a member of Sigma Xi.



**Gar Lam Yip** (S'63-M'67) was born in Shanghai, China, on December 18, 1937. He received the B.Sc. degree from the Imperial College of London University, London, England, in 1960, the M.Sc. degree from Queen's University, Kingston, Ont., Canada, in 1963, and the Ph.D. degree from the University of Toronto, Toronto, Ont., Canada, in 1967, all in electrical engineering.

He was a Teaching Assistant in the Department of Electrical Engineering, Queen's University, from 1961 to 1963, and then at the University of Toronto, from 1963 to 1967, in the areas of electronics and electromagnetic theory. Since 1967 he has been an Assistant Professor of Electrical Engineering at McGill University, Montreal, P.Q., Canada, where he is teaching and doing research in the areas of microwaves, antennas and propagation, and waves in plasmas. He spent the summer in 1968 at the Plasma Physics Laboratory, RCA Victor Company, Montreal, and in the summer of 1970 he held a research appointment at the Radio Physics Laboratory, Communications Research Centre, Ottawa, Ont., Canada.

Dr. Yip is a member of Sigma Xi.