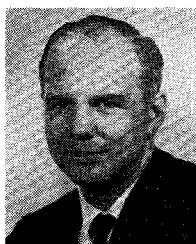


## Contributors



**Charles R. Boyd, Jr.** (S'52 - M'58 - SM'63) received the B.S.E.E. degree from Carnegie Institute of Technology, Pittsburgh, Pa., and the M.E.E. and Ph.D. degrees in electrical engineering from Syracuse University, Syracuse, N. Y., in 1953, 1962, and 1964, respectively. He is also a graduate of 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 in the Baltimore, Md., divisions of Westinghouse Electric Corporation, where he worked on developmental autopilot and side-looking radar equipment. In 1956, he joined General Electric Company, Utica, N. Y., where he helped design a missile transponder for the early Atlas guidance system. In 1957 he transferred to the General Electric Electronics Laboratory, Syracuse, N. Y., and carried out development of advanced microwave semiconductor and ferrite circuits. In 1961-1962 he was on academic leave of absence at Syracuse University, and in 1962-1963 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 the development and design of microwave solid-state components. Since 1967 he has been an Associate Professor of Engineering at the University of California, Los Angeles. He is the author of more than 20 technical papers and reports, and holds a patent on a form of directional coupler.

Dr. Boyd is a Registered Professional Engineer in the State of New York.

he was associated with the Special Microwave Devices Operation of Raytheon Company, Waltham, Mass., where he specialized in the design and development of high-power waveguide ferrite devices. In 1966, he joined the scientific staff of Louvain University, Belgium, as Research Assistant, where he is presently working towards the Ph.D. degree in applied science.

Mr. Gardiol is an Associate Member of Sigma Xi.



**Fred E. Gardiol** (S'68) was born in Corsier/s/Vevey, Switzerland, on December 2, 1935. He received the degree of Physicist Engineer from the Ecole Polytechnique of the University of Lausanne, Switzerland, in 1960, and the S.M. degree in electrical engineering from the Massachusetts Institute of Technology, Cambridge, in 1965.

From 1960 to 1961, he was a Production Engineer with Transitron Electronic Corporation, Wakefield, Mass. From 1961 to 1966,

In 1965 he joined the Science Center, North American Rockwell Corporation, Thousand Oaks, Calif., where he is currently engaged in research work on nuclear and electron paramagnetic resonance.

Dr. Gray is a member of the American Physical Society and an Associate of the Institute of Physics and Physical Society.

For a photograph and biography please see page 267 of the April, 1968, issue of this TRANSACTIONS.



**William E. Hord**, for a photograph and biography please see page 267 of the April, 1968, issue of this TRANSACTIONS.

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**Allan V. James** (A'44 - S'51 - M'58) was born in Kingstown, Jamaica, BWI, on March 24, 1913. He received the B.S. degree in electrical engineering from the Milwaukee School of Engineering, Milwaukee, Wis., in 1950, and the M.S. degree in electrical engineering from the Polytechnic Institute of Brooklyn, Brooklyn, N. Y., in 1956.

From 1951 to 1956, he was employed by the Polytechnic Research Institute, where he designed several bolometric and calorimetric power meters for operation in the microwave region. From 1956 to 1959, he was engaged in the design of microwave components at the Polytechnic Research and Development Company. From 1959 to 1966 he was with the Sperry Gyroscope Company, where he was engaged in the development of improved measurement techniques. Presently, he is a Measurement Development Engineer in the Electronic Systems Center of the Grumman Aircraft Engineering Corporation, Bethpage, N. Y.

Mr. James is a member of the Precision Measurement Association.

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**Kenneth W. Gray** was born in Southampton, England, on March 20, 1939. He received the B.Sc. and Ph.D. degrees in physics from the University of Wales, Bangor, in 1960 and 1963, respectively. From 1963 to 1965, he held a National Research Council of Canada Postdoctoral Research Fellowship in the Physics Department of the University of British Columbia, Vancouver, Canada.

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**Walter N. Hardy** was born in Vancouver, British Columbia, Canada, on March 25, 1940. He received the B.Sc. degree in mathematics and physics and the Ph.D. degree in experimental physics from the University of British Columbia, Vancouver, in 1961 and 1965, respectively. From 1964 to 1966, he was a National Research Council Postdoctoral Fellow at the Centre d'Etudes Nucléaires de Saclay in France.

Since 1966, he has been at the Science Center, North American Rockwell Corporation, Thousand Oaks, Calif. His main interests have been in the study of molecular motion in gases and molecular solids by the techniques of magnetic resonance.

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

**David W. Kammler** was born in Belleville, Ill., on October 29, 1940. He received the B.A. degree in chemistry in 1962, the B.S. degree in physics, also in 1962, and the M.A. degree in mathematics in 1964 from Southern Illinois University, Carbondale. During the 1964-65 academic year he studied mathematics and physics at the University of Sheffield, England, under a Rotary Foundation Fellowship.

Since 1965 he has been a member of the technical staff of the Equipment Group Research and Development Laboratory, Texas Instruments Incorporated, Dallas, where he has been working on a number of problems arising in the development of broadband microwave couplers.

Mr. Kammler is a member of Phi Kappa Phi, Sigma Pi, and the American Mathematical Society.



**Robert B. Mouw** (S'59-M'62) was born in Makassar, Celebes, Indonesia, on August 15, 1932. He received the B.S. and M.S. degrees from the University of California, Berkeley, in 1959 and 1960, respectively.

From 1960 to 1962 he was with the Hewlett-Packard Company, Palo Alto, Calif., working on microwave component development. During 1963 he was with Melabs, Palo Alto, where he developed comb spectrum generators and harmonic multipliers. From 1963 to 1968, he was with Aer-tech, Sunnyvale, Calif., where he held various engineering management positions and developed tunnel diode amplifiers, tunnel diode detectors, microwave transistor amplifiers, and mixer/modulators. Since March, 1968, he has been Technical Director at DeMornay Bonardi, Pasadena, Calif., and is currently working in the area of microwave instrumentation.

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**Fred J. Rosenbaum** (S'57-M'63), for a photograph and biography please see page 267 of the April, 1968, issue of this TRANSACTIONS.



**Robert W. Silberberg** (A'54-M'59) was born in Boston, Mass., on June 1, 1925. He received the B.S. degree in electrical engineering from Northeastern University, Boston, Mass., in 1950.

From 1951 to 1953 he was a member of

the technical staff at M.I.T. Lincoln Lab., Cambridge, Mass. From 1953 to 1956 he was an Antenna Engineer at the Gabriel Laboratories in Needham Heights, Mass., engaged in the design and development of military radar antenna systems. From 1956 to 1959 he was a Senior Engineer at Diamond Antenna and Microwave Corporation, Wakefield, Mass., engaged in custom microwave component design. In 1959 he joined Cascade Research Company, a division of Monogram Precision Industries, Los Angeles, Calif., as a Project Engineer engaged in microwave ferrite device design. From 1960 to 1962 he was Chief of the Microwave Systems Section at Canoga Electronics Corporation, Van Nuys, Calif., where he participated in the design of antenna ground systems for Project Mercury. From 1963 to 1967 he was a Research Specialist at the Space and Information Systems Division, North American Aviation, Inc., Downey, Calif. He participated in radar cross-section design for the "Hound Dog"

missile, antenna system analysis for Project Apollo, antenna research on communication satellites, and research on microwave radiometry techniques from orbiting vehicles. In 1967 he joined the technical staff of TRW Systems Group, Redondo Beach, Calif., where he is presently engaged in spacecraft antenna design for the Aerospace Systems Section of the Antenna Systems Laboratory.

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**Edgar J. Thompson** was born in Salt Lake City, Utah, on December 12, 1935. He received the B.S. degree in physics and mathematics and the M.S. degree in physics from Brigham Young University, Provo, Utah, in 1959 and 1961.

From 1961 to 1962 he was a member of the technical staff of Hughes Aircraft Co., Culver City, Calif. In 1962 he joined the staff of the Space Sciences Laboratory of North American Aviation, Inc., Space and Information Systems Division, Downey, Calif., where he conducted research on aerodynamic plasmas. Since 1964 he has been concerned with the study of thermal emission from the ocean surface at microwave frequencies.