Contributors to This Issue

Richard R. Anderson, B.S.M.E., 1949, Northwestern University; M.S.E.E., 1960, Stevens Institute of Technology; Bell Telephone Laboratories, 1949—. Mr. Anderson first engaged in research on electronic switching systems for telephone central offices. In 1956 he joined the data transmission exploratory development department and made several prototype magnetic-tape transports for storing digital data. He has recently conducted theoretical studies of data transmission systems by computer simulation. Member, A.A.A.S., Sigma Xi, and Tau Beta Pi.

Sidney Darlington, B.S., 1928, Harvard College; B.S. in E.E., 1929, Massachusetts Institute of Technology; Ph.D., 1940, Columbia University; Bell Telephone Laboratories, 1929—. He has been engaged in research in applied mathematics with emphasis on network theory and military and space electronics. He holds more than 20 patents in these fields. Fellow, IEEE; member, AIAA.

Robert W. DeGrasse, B.S., 1951, California Institute of Technology; M.S., 1954, and Ph.D., 1958, Stanford University; Bell Telephone Laboratories, 1957–1960; Microwave Electronics Corp., 1960—. Mr. DeGrasse's work at Bell Laboratories was in research and development of solid state masers. He took part in the development of the ruby maser used in the Bell Laboratories receiving system for the Project Echo satellite communication experiments. Member, IEEE and Sigma Xi.

F.E. Froehlich, B.S., 1950, M.S., 1952, Ph.D., 1955, Syracuse University; Bell Telephone Laboratories, 1954—. Upon joining Bell Laboratories, Mr. Froehlich worked with magnetic core memory and magnetic core switching devices and circuits. In 1956 he became engaged in exploratory development of DATA-PHONE systems and subsequently had charge of groups conducting research and development in in the field of digital communications. He is now head of the high-speed data terminals department and is concerned with data transmission over wideband channels, digital coding and error control systems, and maintenance equipment for data services. Senior member, IEEE; member of Data and Telegraph Communication Committee and Communi-

cation Theory Committee; Chairman of the Monmouth County, N. J. subsection of the PTGCS. Member, American Physical Society, Sigma Xi, Phi Beta Kappa, Sigma Pi Sigma and Pi Mu Epsilon.

Eugene I. Gordon, B.S., 1952, City College of New York; Ph.D., 1957, Massachusetts Institute of Technology; Bell Telephone Laboratories, 1957—. A member of the electron device laboratory, he is engaged in research in optical masers and optical modulation techniques. Member, American Physical Society, Phi Beta Kappa, Sigma Xi and IEEE.

Stephen E. Harris, B.E.E., 1959, Rensselaer Polytechnic Institute; M.S.E.E., 1961, Stanford University; Bell Telephone Laboratories, 1959—. Mr. Harris was engaged in work on microwave noise generation and later in work on the development of traveling-wave masers. Since September, 1960, he has been on leave of absence from Bell Laboratories to pursue doctoral studies at Stanford University. He is also presently serving as an acting professor of electrical engineering at Stanford. Member, Tau Beta Pi, Sigma Xi, Eta Kappa Nu, American Physical Society, Optical Society of America and IEEE.

Jessie MacWilliams, B.A., 1939, M.A., 1941, Cambridge (England); Ph.D., 1962, Harvard; Bell Telephone Laboratories 1956—. Mrs. MacWilliams has been concerned with writing computer programs for the analysis and synthesis of transmission networks. She is now engaged in data systems studies, particularly the study of algorithms for decoding systematic error-correcting codes. Member, Mathematical Association of America and American Mathematical Society.

E. O. Schulz-DuBois, Dipl. phys., 1950, and Dr. Phil. nat., 1954, Johann Wolfgang Goethe University (Germany); Purdue University, 1954–1955; Raytheon Manufacturing Co., 1956–1957; Bell Telephone Laboratories, 1957—. At Purdue Mr. Schulz-DuBois was engaged in paramagnetic resonance studies of irradiated semiconductors. At Raytheon he was concerned with the development of ferrite materials and devices. After joining Bell Laboratories his work was with paramagnetic materials, slow-wave structures, and ferrimagnetic isolators for application to solid state maser devices. More recently he was responsible for a group engaged in advanced development of traveling-wave masers and in related exploratory studies. Since September 1963 he has been on sabbatical leave as visiting professor at Technische Hochschule, Karlsruhe (Germany).

ERLING D. SUNDE, Dipl. Ing., 1926, Technische Hochschule, Darmstadt, Germany; American Telephone and Telegraph Co., 1927–1934; Bell Telephone Laboratories, 1934—. He has made theoretical and experimental studies of inductive interference from railway and power systems, lightning protection of the telephone plant, and fundamental transmission studies in connection with the use of pulse modulation systems. He is the author of *Earth Conduction Effects in Transmission Systems*, a Bell Laboratories Series book. Fellow, IEEE; member, A.A.A.S. and American Mathematical Society.

ELIZABETH A. WOOD, B.A., 1933, Barnard College; M.A. 1934 and Ph.D., 1939, Bryn Mawr College; D.Sc., 1963, Wheaton College; Bell Telephone Laboratories, 1943—. Mrs. Wood's first work at Bell Laboratories had to do with the development of techniques for producing quartz oscillator plates. Since then she has been using X-ray diffraction and optical methods for studying a wide variety of crystals, most of them of interest because of being ferroelectric. She is the author of *Crystal Orientation Manual* (Columbia University Press, 1963) and *Crystals and Light* (D. Van Nostrand, 1963). Member and past President (1957), American Crystallographic Association; Fellow, American Physical Society and Mineralogical Society of America.