

## Contributors to This Issue

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R. L. GRAHAM, B.S., 1958, University of Alaska; M.A., Ph.D., 1962, University of California (Berkeley); Bell Telephone Laboratories, 1962—. Mr. Graham's recent interests have been in the fields of combinatorial analysis, graph theory, finite structures and their applications to coding theory, and the analysis of algorithms. He is Head of the Discrete Systems and Control Department. Member, American Mathematical Society, Mathematical Association of America, Society for Industrial and Applied Mathematics, Sigma Xi, American Association for the Advancement of Science.

E. Y. Ho, B.S.E.E., 1964, The National Taiwan University; Ph.D., 1969, University of Pennsylvania; Bell Telephone Laboratories, 1969—. Mr. Ho has been engaged in developing and analyzing automatic equalizers for data transmission systems. Member, IEEE.

JACK M. HOLTZMAN, B.E.E., 1958, City College of New York; M.S., 1960, University of California (Los Angeles); Ph.D., 1967, Polytechnic Institute of Brooklyn; Hughes Aircraft Company, 1958-1963; Bell Telephone Laboratories, 1963—. Mr. Holtzman has worked in various aspects of systems and control theory and is the author of *Nonlinear System Theory—A Functional Analysis Approach* (Prentice-Hall, 1970). He is the supervisor of a group working on system theory and stochastic problems. Member, SIAM.

JAMES E. KESSLER, B.S.E.E., 1958, Purdue University; M.S.E.E., 1960, New York University; Bell Telephone Laboratories, 1958—. Mr. Kessler was involved initially with long-range studies of the waveguide transmission system, including cost studies and network configurational aspects. He has also participated in field trials and evaluation of the T1 carrier system. More recently, he has done data analysis of transmission parameters and customer interconnection planning.

DIETRICH MARCUSE, Diplom Vorpruefung, 1952, Dipl. Phys., 1954, Berlin Free University; D.E.E., 1962, Technische Hochschule, Karlsruhe, Germany; Siemens and Halske (Germany), 1954–57; Bell Telephone Laboratories, 1957—. At Siemens and Halske, Mr. Marcuse was engaged in transmission research, studying coaxial cable and circular waveguide transmission. At Bell Telephone Laboratories, he has been engaged in studies of circular electric waveguides and work on gaseous masers. He spent one year (1966–1967) on leave of absence from Bell Telephone Laboratories at the University of Utah where he wrote a book on quantum electronics. He is presently working on the transmission aspect of a light communications system. Member, IEEE, Optical Society of America.

D. MITRA, B.Sc.(E.E.), 1964, and Ph.D.(E.E.), 1967, University of London; United Kingdom Atomic Energy Authority Research Fellow 1965–1967; University of Manchester, U.K., 1967–1968; Bell Telephone Laboratories, 1968—. Mr. Mitra, a member of the Systems Theory Research Department, is interested in the application of mathematical methods to physical problems.

HENRY O. POLLAK, B.A., 1947, Yale University; Ph.D., 1951, Harvard University; Bell Telephone Laboratories, 1951—. Since joining Bell Laboratories, Mr. Pollak has been engaged in mathematical research in communications. He has written technical papers on analysis, function theory, and probability theory. At present he is Director, Mathematics and Statistics Research Center. Member, American Mathematical Society, Mathematical Association of America (formerly on its Committee on the Undergraduate Program), Advisory Board of the School Mathematics Study Group of the NSF Advisory Panel for Mathematical Sciences, International Commission on Mathematical Instruction.

GEORGE H. ROBERTSON, B.Sc., 1943, and Post Graduate Certificate (Natural Philosophy), 1948, University of Glasgow; Bell Telephone

Laboratories, 1948—. Until 1958 Mr. Robertson was engaged in electronics research and a variety of electron tube development projects. Since 1958 he has been working on signal propagation and processing studies in the Ocean Systems Research Department. Associate member, IEEE; member, AAAS.

R. A. SEMPLAK, B.S. (Physics), 1961, Monmouth College, N.J.; Bell Telephone Laboratories, 1955—. Mr. Semplak, a member of the Atmospheric Physics Research Department, has also been engaged in research on microwave antennas and propagation. He participated in the Project Echo and *Telstar*® communications satellite experiments. He currently is concerned with the attenuation effects of rain on propagation at 18.5 and 30.9 GHz. Member, Sigma Xi, Commission II of International Scientific Radio Union (URSI).

JOHN L. SULLIVAN, B.S.E.E., 1953, Iowa State University; M.S.E.E., 1959, Newark College of Engineering; Bell Telephone Laboratories, 1953—. Mr. Sullivan has worked on television test equipment and on establishing transmission objectives for exchange area trunks, wide-area data service, electronic telephone sets, and *Touch-Tone*® calling. He presently supervises a group involved in subjective testing to determine observer reaction to telephone message and television transmission impairments and in studying methods of objectively characterizing the transmission performance of telephone connections. In addition, he is involved in Bell System, national, and international standards activities. Member, Acoustical Society of America.

EDMOND J. THOMAS, B.S.E.E., 1964, and M.S., 1965, Rensselaer Polytechnic Institute; Rutgers University, 1968; Bell Telephone Laboratories, 1965—. Mr. Thomas has been engaged in studying the applicability of various adaptive control systems to the echo control problem. Specifically he has been characterizing the performance of these systems in nonlinear and time varying environments. He also has been involved in designing a computer testing system for measuring the electrical characteristics of telephone networks. Presently he is investigating various methods of transmitting data over microwave radio. Member, IEEE, Tau Beta Pi, Eta Kappa Nu, Sigma Xi.

GERARD WHITE, B.Sc., 1963, and Ph.D., 1966, University of Wales, Bangor; Bell Telephone Laboratories 1967—. Mr. White is a member of the Communication Principles Research Laboratory where his ac-

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ROGER I. WILKINSON, B.S.E.E., 1924, and Prof.E.E., 1950, Iowa State University; A.T.&T. Co. Dev. and Res. Dept., 1924-1934; Bell Telephone Laboratories, 1935-1968; Special Consultant to U. S. Air Force in Operations Analysis, 1943-45. Mr. Wilkinson has been engaged in the application of the theory of probability to telephone traffic problems since joining the Bell System. He was also concerned with the design of early sampling procedures for quality indexes in operating companies. He has contributed to studies of customer characteristics; the combination of probability distributions; and the extension of standard traffic theory to allow for day-to-day variations, repeated attempts, and nonrandom offered loads, by use of "equivalent random" procedures. At the time of his retirement in 1968 Mr. Wilkinson was Head of the Traffic Research Department. Fellow, IEEE; Member, American Statistical Association, Institute of Mathematical Statistics, Operations Research Society of America, American Society for Quality Control, Eta Kappa Nu, Tau Beta Pi, Pi Mu Epsilon, Phi Kappa Phi.

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