

## Contributors to This Issue

W. E. BEADLE, B.S.(M.E.), 1954, M.S.(E.E.), 1958, Montana State University; Electrical Engineer, 1963, Stanford University; Research Associate, Montana State University, 1958-1961; Bell Telephone Laboratories, 1963—. At Bell Laboratories, Mr. Beadle has been working primarily in the area of semiconductor device technology. He initially worked on germanium microwave transistor development. More recently his work has been on the silicon diode arrays for optical image sensing. He is Supervisor, Integrated Circuits Department. Member, IEEE, Sigma Xi, Tau Beta Pi.

E. R. BERLEKAMP, B.S. and M.S. (electrical engineering), 1962, from Massachusetts Institute of Technology on the cooperative program with Bell Telephone Laboratories; Ph. D., 1964, Massachusetts Institute of Technology; taught at the University of California, Berkeley, 1964-1967; Bell Telephone Laboratories, 1967—. Mr. Berlekamp has been engaged in research in algebraic coding theory and related combinatorial mathematics. Member, IEEE, American Mathematical Association, editorial boards of *Information and Control* and the *American Mathematical Monthly*.

ROBERT W. CHANG, B.S.E.E., 1955, National Taiwan University; M.S.E.E., 1960, North Carolina State University; Ph.D., 1965, Purdue University; Bendix Corporation, 1960-1963; Bell Telephone Laboratories, 1965—. Mr. Chang has worked on a variety of problems in data transmission and communication system theory. Member, Phi Kappa Phi, Eta Kappa Nu, Sigma Xi, Association for Computing Machinery, IEEE.

D. B. FRASER, B.Sc. (Hons.), 1954, University of Manitoba; M.A., 1955, and Ph.D., 1958, University of Toronto; Bell Telephone Laboratories, 1959—. At Bell Laboratories, Mr. Fraser has studied materials for ultrasonic devices and holographic storage. He is now engaged in studies of sputtered thin films and ferroelectric ceramic studies related to optical display devices. Member, American Physical Society, A.A.A.S.

B. GOPINATH, M.S. (mathematical physics), 1964, University of Bombay, India; M.S.E.E. and Ph.D.(E.E.), 1968, Stanford University; postdoctoral research associate, Stanford, 1967-1968; Bell Telephone Laboratories, 1968—. Mr. Gopinath's primary interest, as a member of the Systems Theory Research Group, is in the applications of mathematical methods to physical problems.

D. A. GRAY, B.S.E.E., 1963, Tufts University; M.S.E.E., 1965, and Ph.D.(E.E.), 1969, Stanford University; Bell Telephone Laboratories, 1969—. Mr. Gray is working on studies of the propagation of millimeter waves through rainfall. Member, Sigma Xi, Tau Beta Pi, Eta Kappa Nu.

R. R. LAANE, B.S.E.E., 1962, University of Illinois; M.S.E.E., 1964, New York University; Bell Telephone Laboratories, 1962—. Mr. Laane has worked on the application of superconductive switches to data processing systems and has investigated the application of optical processing techniques to data processing systems. Since 1967, he has been engaged in exploratory work on the application of semiconductor devices to telephone switching networks and on analog-to-digital conversion techniques. He is presently also working on solid-state *Picturephone*<sup>®</sup> switching networks. Member, IEEE.

J. A. LEWIS, B.S., 1944, Worcester Polytechnic Institute; M.S., 1948, and Ph.D., 1950, Brown University; Bell Telephone Laboratories, 1951—. Mr. Lewis has worked on problems in piezoelectricity, elasticity, and heat conduction. He is currently concerned with semiconductor problems. Member, American Mathematical Society, Society for Industrial and Applied Mathematics, American Institute of Aeronautics and Astronautics.

MRS. F. J. MACWILLIAMS, B.A., 1939, and M.A., 1941, Cambridge University, England; Ph.D., 1962, Harvard University; Bell Telephone Laboratories, 1956—. Mrs. MacWilliams has worked in transmission networks development and data communications engineering, and is now in mathematics research. Member, Mathematical Association of America, American Mathematical Society.

J. R. MALDONADO, D.C.F.M., 1961, University of Havana, Cuba; Ph.D., 1968, University of Maryland; Bell Telephone Laboratories, 1968—. Since joining Bell Laboratories, Mr. Maldonado has worked with ferroelectric ceramic materials for optical device applications. Member, American Physical Society, Sigma Pi Sigma, Sigma Xi.

HANS G. MATTES, B.S.E.E., 1964, California Institute of Technology; M.S.E.E., 1966, and Ph.D., 1968, University of Southern California; Bell Telephone Laboratories, 1968—. Mr. Mattes is engaged in the development of substrates for integrated electronics. Member, Sigma Xi.

A. H. Meitzler, B.S., 1951, Muhlenberg College; M.S., 1953, and Ph.D., 1955, Lehigh University; Bell Telephone Laboratories, 1955—. Mr. Meitzler has worked in the areas of ultrasonic devices, acoustic losses in solids, piezoelectric and ferroelectric transducer materials, and most recently, in the area of display devices using ferroelectric materials. Member, American Physical Society, IEEE, Acoustical Society of America, Sigma Xi.

S. C. MOORTHY, B. S., 1961, Kerala University, India; M. S., 1963, and Ph. D., 1966, University of Pennsylvania; Bell Telephone Laboratories, 1967—. He has worked in phased-array antennas and electromagnetic pulse effects and is currently doing research in the area of millimeter waveguides. Member, I.E.E.E, American Physical Society, Sigma Xi.

G. S. MOSCHYTZ, M.S.E.E., 1958, and Ph.D., Electrical Engineering, 1960, Federal Institute of Technology, Zurich, Switzerland; Bell Telephone Laboratories, 1963—. Since joining Bell Laboratories, Mr. Moschytz has investigated methods of synthesizing linear and digital circuits to be used in data transmission equipment that can be microminiaturized by combining thin film and silicon integrated circuit elements. This work has included the design of active RC data modems and filter schemes suitable for hybrid integrated circuit implementation as well as the design of silicon integrated linear and digital devices. He is Supervisor of the Active Filter Group in the Data Communications Laboratory. Member, IEEE.

B. T. MURPHY, B.S., 1953, Ph.D., 1959, University of Leeds, England; Bell Telephone Laboratories, 1963—. Mr. Murphy worked in the field of medical physics at the University of Leeds, on electron beam studies at Mullard Research Laboratories, and since 1959 has been engaged in work on semiconductor devices. At Bell Laboratories, he has worked on semiconductor device modeling, the circuit and the structural aspects of semiconductor integrated circuits, and millimeter wave IMPATT diodes. He is Head of the Exploratory Device Department. Member, IEEE, American Physics Society.

V. K. PRABHU, B.E. (Dist.), 1962, Indian Institute of Science, Bangalore, India; S.M., 1963, and Sc.D., 1966, Massachusetts Institute of Technology; Bell Telephone Laboratories, 1966—. Mr. Prabhu has been concerned with various theoretical problems in solid-state microwave devices, noise, and optical communication systems. Member, IEEE, Eta Kappa Nu, Sigma Xi, Tau Beta Pi, AAAS.

A. J. SCHORR, B.S.(M.E.), 1960, Carnegie Mellon; M.S.(M.E.), 1964, University of Pittsburgh; Bell Telephone Laboratories, 1964—. Mr. Schorr has studied glass-metal systems for miniature diodes, analyzed thermal conductance of multi-material structures, performed thermal conductivity studies, and has been involved in the numerical solution of problems relating to the characterization of semiconductor devices. Member, Pi Tau Sigma.

M. M. SONDHI, B.S. (Honours), 1950, Delhi University (Delhi, India); D.I.I.Sc., 1953, Indian Institute of Science (Bangalore, India); M.S., 1955, and Ph.D., 1957, University of Wisconsin; Bell Telephone Laboratories, 1962—. Mr. Sondhi is working on problems concerning the processing and transmission of speech signals and modeling the detection of auditory and visual signals by human beings.

E. WASSERSTROM, B.S., 1956, M.S., 1960, Technion-Israel Institute of Technology; Ph.D., 1964, Brown University; Division of Sponsored Research at M.I.T., 1962-1964; Department of Aeronautical Engineering at the Technion, 1964-1968, 1969—; Bell Telephone Laboratories (on leave of absence from the Technion), 1968-1969. He is currently engaged in numerical analysis.