

## Contributors to This Issue

WALTER J. BERTRAM, JR., B.S., 1956, M.S., 1957, Ph.D. (Physics), 1961, Carnegie Inst. of Tech.; Bell Telephone Laboratories, 1960—. Mr. Bertram's early work at Bell Laboratories was on the development of low-noise traveling-wave tubes. From 1962 through 1966 he supervised a group developing low-noise wide-band parametric amplifiers, tunnel diode amplifiers, and down-converters. He then supervised a group involved in the development of electroluminescent diodes and in the development of acousto-optic modulators. Since 1970 he has supervised the development of imaging devices using the charge coupling principle. Member, American Physical Society, Institute of Electrical and Electronics Engineers, American Association for the Advancement of Science.

KENNETH BULLINGTON, B.S., 1936, University of New Mexico; S.M., 1937, Massachusetts Institute of Technology; Bell Telephone Laboratories, 1937—. Mr. Bullington has worked on transmission engineering problems on wire, radio, and submarine cable systems. He is now Radio Consultant. In 1956 he received the Morris Liebmann Memorial Prize of the Institute of Radio Engineers and the Franklin Institute's Stuart Ballantine Medal for contributions in tropospheric transmission and its application to practical communications systems. Fellow, IEEE. Member, Phi Kappa Phi, Sigma Tau, Kappa Mu Epsilon.

J. C. CANDY, B.Sc., 1951, and Ph.D., 1954, University of Wales, Bangor, Wales; Research Associate at the University of Minnesota, 1959-60; Bell Telephone Laboratories, 1960—. Mr. Candy has worked on digital circuits and pulse transmission systems. He is studying methods of processing video signals, and is designing digital coders. Member, IEEE.

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.

DONALD C. COX, B.S. (E.E.), 1959, and M.S. (E.E.), 1960, University of Nebraska; Ph.D. (E.E.), 1968, Stanford University; U. S. Air Force Research and Development Officer, Wright-Patterson AFB, Ohio, 1960-1963; Bell Telephone Laboratories, 1968—. Since coming to Bell Laboratories from Stanford, where he was engaged in microwave trans-horizon propagation research, Mr. Cox has been engaged in microwave propagation research in mobile radio environments and in high-capacity mobile radio systems studies. Member, IEEE, Commission II of USNC/URSI, Sigma Xi, Sigma Tau, Eta Kappa Nu, Pi Mu Epsilon.

MRS. MARIE A. FRANKE, A.A.S., 1967, Fayetteville Technical Institute; Bell Telephone Laboratories, 1967—. Since joining Bell Telephone Laboratories, Mrs. Franke has been engaged in developing digital techniques to reduce the frame-to-frame redundancy in television pictures for visual telephone applications.

ARTHUR D. FRIEDMAN, B.A., 1961, B.S., 1962, M.S., 1963, and Ph.D., 1965, Columbia University; Bell Telephone Laboratories 1965—. As a member of the Computing Techniques Research Department, Mr. Friedman has been interested in various switching theory problems. Member, IEEE, Eta Kappa Nu, Tau Beta Pi, Sigma Xi.

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FRANCIS S. HILL, JR., B.E., 1962, M.E., 1964, and Ph.D., 1968, Yale University; Bell Telephone Laboratories, 1967-1970. Mr. Hill was concerned with various analysis problems in the area of digital data communications. He is presently an Assistant Professor at the University of Massachusetts, Amherst, Mass. Member, IEEE, Sigma Xi, Tau Beta Pi, Eta Kappa Nu.

WILLIAM B. JOYCE, B.E.P., 1955, Cornell University; Ph.D., 1966, Ohio State University; Bell Telephone Laboratories, 1966—. Mr. Joyce has worked on various mathematical aspects of semiconductor device development. Member, APS.

WILLIAM C.-Y. LEE, B.S.C. in Engineering, 1954, Chinese Naval Academy; M.Sc. in E.E., 1960, and Ph.D. in E.E., 1963, Ohio State University; Bell Telephone Laboratories, 1964—. Mr. Lee has been concerned with the study of wave propagation in anisotropic medium and antenna theory. His present work has included studies of mobile radio antennas, signal fading problems, and communication systems, particularly those relating to the UHF and X-band regions. Member, Sigma Xi, IEEE.

JOHN O. LIMB, B.E.E., 1963, and Ph.D., 1967, University of Western Australia; Research Laboratories, Australian Post Office, 1966–1967; Bell Telephone Laboratories, 1967—. Mr. Limb has worked on the coding of picture signals to reduce channel capacity requirements. More recently this has included the coding of color pictures. He is now working on methods of reducing redundancy in moving pictures for *Picturephone*® visual telephone applications.

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. MAYDAN, B.Sc., 1957, and M.Sc., 1962, Technion, Israel Institute of Technology, Israel; Ph.D., 1965, Edinburgh University, Scotland; Israel Atomic Energy Commission, 1957–1962 and 1965–1967; Bell Telephone Laboratories, 1967—. Mr. Maydan is a member of the Active Optical Device Department and is working on acoustooptical devices and laser machining for fast image recording.

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CHARLES M. NAGEL, JR., B.S., 1964, and M.S., 1967, Stevens Institute of Technology; Bell Telephone Laboratories, 1965-1971. At the time of his death, Mr. Nagel was a member of the Applied Mathematics and Statistics Department, working in the area of optical communications theory. Previously, he had been engaged in research into the numerical aspects of various waveguide propagation problems, Faraday rotation in the ionosphere, and electromagnetic scattering. Mr. Nagel was a member of Tau Beta Pi, Pi Delta Epsilon, and the American Association for the Advancement of Science.

SCOTTY R. NEAL, B.A. (Mathematics), 1961, M.A. (Mathematics), 1963, and Ph.D. (Mathematics), 1965, University of California, Riverside; Research Mathematician, Naval Weapons Center, China Lake, California, 1964-1967; Bell Telephone Laboratories, 1967—. Since coming to Bell Laboratories, Mr. Neal has been primarily concerned with the analysis of various aspects of telephone traffic systems. He has also worked on applications of optimal linear estimation theory and certain aspects of communication theory. Member, American Math Society, SIAM, Sigma Xi.

R. F. W. PEASE, B.A., 1960, M.A. and Ph.D., 1964, University of Cambridge; Bell Telephone Laboratories, 1967—. Mr. Pease held a faculty appointment at the University of California at Berkeley prior to joining Bell Laboratories and worked on electron microscopy. He is now trying to efficiently encode moving and still pictures.

DOUGLAS O. REUDINK, B.A., 1961, Linfield College; Ph.D. (Mathematics), 1965, Oregon State University; Bell Telephone Laboratories, 1964—. Since joining Bell Laboratories, Mr. Reudink has been engaged in electronic systems research with particular emphasis in the field of mobile communications. His recent work has been concerned with fundamentals of mobile radio propagation, diversity techniques,

and the configuration and control of mobile systems. Member, Sigma Pi Sigma, American Mathematical Society, Pi Mu Epsilon, IEEE.

M. V. SCHNEIDER, M.S., 1956, and Ph.D., 1959, Swiss Federal Institute of Technology, Zurich, Switzerland; Bell Telephone Laboratories, 1961—. Mr. Schneider has been engaged in experimental work on thin film solid-state devices, Schottky barrier photodetectors, and thin film mode selection filters. He has published contributions on microstrip and thin film technology, on the design of microstrip circuits, and on the reduction of conductor and dielectric losses in microstrip transmission lines. He is presently working on hybrid integrated circuits for systems applications at microwave and millimeter-wave frequencies. Member, American Physical Society, American Vacuum Society, IEEE.

N. L. SCHRYER, B.S., 1965, M.S., 1966, Ph.D., 1969, University of Michigan; Bell Telephone Laboratories, 1969—. Mr. Schryer has worked on the numerical solution of parabolic and elliptic partial differential equations. He is currently studying problems of this type which arise in semiconductor device theory.

WILLIAM W. SNELL, JR., Williamsport Technical Institute, 1951; Bell Telephone Laboratories, 1955—. In his first years with Bell Laboratories Mr. Snell was concerned with the design of waveguide components for use in the 4-, 6-, and 11-GHz common carrier band. He later participated in the Shotput and Project Echo satellite communications experiments where he designed several components of the Holmdel Space Communication Receiver. He is presently concerned with the design and fabrication of high-order varactor frequency multipliers, high-quality varactor diodes, and low-loss microstrip filters for use in hybrid integrated circuits at frequencies above 10 GHz.

R. J. STRAIN, B.S.E.E., 1958, M.S., 1959, Ph.D., 1963, University of Illinois; Standard Telecommunication Laboratories, Harlow, England; Bell Telephone Laboratories, 1965—. Mr. Strain's initial activities in the Electron Device Laboratory were concerned with electroluminescent display devices, particularly GaP diodes. In 1968 he joined the Semiconductor Device Laboratory as a supervisor, and he is now in charge of the Functional Interface Device Group. Member, APS, AAAS, ECS, IEEE, Sigma Xi.

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