

## Contributors to This Issue

C. P. BATES, B.E., 1958, Nova Scotia Technical College, Halifax, Nova Scotia; M.E., 1960, Nova Scotia Technical College; Ph.D., 1966, University of Illinois; Bell Telephone Laboratories, 1966—. Since joining Bell Telephone Laboratories, Mr. Bates has been engaged in research on the propagation of very low frequency (VLF) waves in the earth-ionosphere waveguide, the solution of certain Wiener-Hopf boundary value problems, pulse scattering, and propagation in waveguide bends. Member, IEEE, Sigma Xi.

PAUL T. BRADY, B.E.E., 1958, Rensselaer Polytechnic Institute; M.S.E.E., 1960, Massachusetts Institute of Technology; Ph.D., 1966, New York University; Bell Telephone Laboratories, 1961—. He has worked in modeling on-off speech patterns and speech level distributions, especially as they occur in two-way conversation over circuits containing voice-operated devices and transmission delay. Member, Acoustical Society of America, Sigma Xi.

MRS. H. J. CHEN, M.S. (mathematical statistics), 1959, University of Michigan; Bell Telephone Laboratories, 1960—. She has worked on the development of statistical methods and their applications in statistical testing procedures, sequential analysis, analysis of variance, time-slice work sampling, and economic forecasting. Member, American Statistical Association.

LOUIS H. ENLOE, B.S.E.E., 1955, M.S.E.E., 1956, Ph.D. (E.E.), 1959, University of Arizona; Bell Telephone Laboratories, 1959—. His early work was in modulation and noise theory in connection with space communications. Later work has been with lasers, coherent light, and holography with emphasis upon communication and display. He is head of the Opto-Electronics Research Department. Member, IEEE, Phi Kappa Phi, Sigma Xi, Tau Beta Pi, Pi Mu Epsilon, Sigma Pi Sigma.

CHARLES A. FRITSCH, B.M.E., 1958, University of Dayton; M.S.M.E., 1960, Ph.D., 1962, Purdue University; Bell Telephone Laboratories, 1961—. He has worked on problems in the thermal sciences associated

with hardening structures to withstand nuclear weapon effects, cooling electronic equipment, and developing gas lenses. He is Supervisor of the Fluid Mechanics and Heat Transfer Group of the Engineering Mechanics and Physics Department. Member, American Society of Mechanical Engineers, American Physical Society, Sigma Xi.

EDGAR N. GILBERT, B.S., 1943, Queens College; Ph.D., 1948, Massachusetts Institute of Technology; M.I.T. Radiation Laboratory, 1944-1946; Bell Telephone Laboratories, 1948—. Mr. Gilbert has done research in several branches of applied mathematics and is interested in communication theory. Member, American Mathematical Society, IEEE.

J. E. GOELL, B.E.E., 1962, M.S., 1963, and Ph.D. (E.E.), 1965, Cornell University; Bell Telephone Laboratories, 1965—. While at Cornell Mr. Goell was a teaching assistant and held the Sloan Fellowship and the National Science Cooperative Fellowship. At Bell Telephone Laboratories, he has worked on solid-state repeaters for millimeter wave communication systems and optical integrated circuits. Member, Tau Beta Pi, Eta Kappa Nu, Sigma Xi, Phi Kappa Phi, IEEE.

J. E. IWERSEN, B.S., 1949, Wagner College; M.A., 1951, Ph.D., 1955, The Johns Hopkins University. Bell Telephone Laboratories, 1955—. Mr. Iwersen has been almost continually engaged in work on semiconductor devices. Until recently he headed the Expository Device Department, whose activities include the development of new structures and new applications for devices and integrated circuits. He now heads the Advanced Circuit Technology Department, responsible for the exploratory development of small central offices, optical stores, remote line concentrators, and electronic switching networks.

L. U. KIBLER, B.S., 1950, U. S. Coast Guard Academy; M.S.E.E., 1956, Massachusetts Institute of Technology; Ph.D., 1968, Polytechnic Institute of Brooklyn; Bell Telephone Laboratories, 1956—. Mr. Kibler has been concerned with experimental research in the fields of parametric amplifiers, tunnel diodes, lasers, microwave photo diodes, and Schottky-barrier diode converters. He participated in the design and operation of the receivers for the Echo and *Telstar*<sup>®</sup> communications satellite projects. Now he is engaged in millimeter wave antenna investigations. Member, IEEE, Eta Kappa Nu, Sigma Xi.

SANG H. KYONG, B.S., 1961, University of Rhode Island; Ph.D., 1966, Massachusetts Institute of Technology; Bell Telephone Laboratories, 1966—. Mr. Kyong has worked on radar signal processing and on the analyses of guidance and control systems. He has also been on the adjunct faculty of New York University. Member, American Association for the Advancement of Science, American Nuclear Society, IEEE, SIAM, Phi Kappa Phi, Sigma Xi, Tau Beta Pi.

ARTHUR B. LARSEN, B.S.E.E., 1959, M.S.E.E., 1961, Ph.D., 1966, Case Institute of Technology; Bell Telephone Laboratories, 1966—. Mr. Larsen has been investigating applications of holography and coherent light to visual communications systems. He is also involved with studies of camera systems for color *Picturephone*<sup>®</sup> visual telephone service. Member, IEEE, Optical Society of America, Sigma Xi, Tau Beta Pi, Eta Kappa Nu.

JOHN O. LIMB, B.E.E., 1963, Ph.D., 1967, University of Western Australia; Bell Telephone Laboratories 1967—. Mr. Limb has worked on the coding of television signals to reduce channel capacity requirements. He is currently working on methods of reducing frame-to-frame redundancy in moving pictures for *Picturephone*<sup>®</sup> visual telephone applications.

E. A. J. MARCATLI, Aeronautical Engineer, 1947, and E. E., 1948, University of Cordoba (Argentina); research staff, University of Cordoba, 1947-54; Bell Telephone Laboratories, 1954—. He has been engaged in theory and design of filters in multimode waveguides and in waveguide systems research. More recently he has concentrated on optical transmission media. Fellow, IEEE.

STEWART E. MILLER, B.S. and M.S. in E.E., 1941, Massachusetts Institute of Technology; Bell Telephone Laboratories, 1941—. He first worked on coaxial carrier repeaters and later worked on microwave radar systems development. At the close of World War II he returned to coaxial carrier repeater development until 1949, when he joined the radio research department. There his work has been in circular electric waveguide communication, microwave ferrite devices, and other components for microwave radio systems. As Director,

Guided Wave Research Laboratory, he heads a group engaged in research on communication techniques for the millimeter wave and optical regions. Fellow, IEEE; member, Eta Kappa Nu, Sigma Xi, Tau Beta Pi.

F. W. MOUNTS, E.E., 1953, and M.S., 1956, University of Cincinnati; Bell Telephone Laboratories, 1956—. Mr. Mounts has been concerned with research in efficient methods of encoding pictorial information for digital television systems. Member, IEEE, Eta Kappa Nu.

VASANT K. PRABHU, B. E. (Dist.), 1962, Indian Institute of Science, Bangalore, India; S.M., 1963, 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.

DAVID J. PRAGER, B.A.E., 1961, New York University; M.S., 1965, and Ph.D. (Aeronautics and Astronautics), 1967, Stanford University; Bell Telephone Laboratories, 1967—. He has been engaged in analysis of thermal convection and of underwater acoustical transmission. More recently, Mr. Prager has been concerned with the fluid mechanics of nuclear blasts. Member, American Physical Society.

G. 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 Underwater Research and Systems Departments. Associate member, IEEE; member, AAAS.

M. V. SCHNEIDER, M.S., 1956, and Ph.D., 1959, Swiss Federal Institute of Technology, Zurich, Switzerland; Bell Telephone Laboratories, 1962—. Mr. Schneider has been engaged in experimental work on thin-film solid-state devices, optical detectors, and microwave integrated circuits. Mr. Schneider is now working on hybrid integrated circuits at microwave frequencies and in the millimeter-wave fre-

quency range for solid-state radio systems. Member, IEEE, American Vacuum Society.

DAVID A. SPAULDING, A. B., 1959, M.S., 1960, Dartmouth College; M.S., 1961, Ph.D., 1965, Stanford University; Bell Telephone Laboratories, 1967—. Mr. Spaulding has been concerned with network studies for data transmission systems. Member, IEEE, Phi Beta Kappa, Sigma Xi.

W. H. WILLIAMS, B.A. (mathematics), McMaster University, 1954; M.S., 1956, and Ph.D., 1958 (statistics), Iowa State University. Before joining Bell Laboratories in 1960 he held faculty appointments at both universities. At Bell Laboratories he has worked on developing statistical methodology for survey sampling, time and cost analysis, and economic forecasting. He is a consultant to the U. S. Census Bureau and to the Executive Office of the U. S. President. Member, American Statistical Association, American Economic Association, Econometric Society, American Finance Association; Fellow, Royal Statistical Society.

JACK K. WOLF, B.S. in electrical engineering, 1956, University of Pennsylvania; M.S.E., 1957, M.A., 1958, and Ph.D., 1960, Princeton University; Bell Telephone Laboratories, 1968-1969. Mr. Wolf is an Associate Professor of Electrical Engineering at the Polytechnic Institute of Brooklyn; for the academic year 1968-1969 he was on a leave of absence to the Communications Theory Department at Bell Laboratories, Murray Hill, New Jersey. His main interests are in information theory, algebraic coding theory, and detection theory. Member, Tau Beta Pi, Sigma Xi, Sigma Tau, Eta Kappa Nu, Pi Mu Epsilon, IEEE, American Association for the Advancement of Science, American Association of University Professors.

C. P. WU, B.S., 1956, The National Taiwan University; M.S., 1959, and Ph.D., 1962, Ohio State University; Bell Telephone Laboratories, 1962—. Mr. Wu was an assistant instructor at the National Taiwan University during the 1956-57 academic year. He has done research in electromagnetic radiation in anisotropic media. His present work includes phased array antennas and development of numerical techniques for application in electromagnetic scattering and waveguiding problems. Member, IEEE, Sigma Xi.

1039-4-3<sup>45</sup>