Contributors to This Issue

L. K. Anderson, B.Eng. (Engineering Physics), 1957, McGill University; Ph.D. (Electrical Engineering), 1962, Stanford University; Bell Telephone Laboratories, 1961—. He first engaged in work on problems of optical modulation and detection in microwave solid-state devices. Particular areas included modulation of light using ferrimagnetic resonance in garnets, development of high-speed semiconductor photodiode detectors and electro-optic light modulators. He presently supervises the microwave ferrite device group. Member, IEEE.

Vaclav E. Beneš, A.B., 1950, Harvard College; M.A. and Ph.D., 1953, Princeton University; Bell Telephone Laboratories, 1953—. Mr. Beneš has been engaged in mathematical research on stochastic processes, traffic theory, and servomechanisms. In 1959–60 he was visiting lecturer in mathematics at Dartmouth College. He is the author of *General Stochastic Processes in the Theory of Queues* (Addison-Wesley, 1963). Member, American Mathematical Society, Association for Symbolic Logic, Institute of Mathematical Statistics, Society for Industrial and Applied Mathematics, Mind Association and Phi Beta Kappa.

D. P. Borenstein, B.E.E. and B.A., 1960, M.E.E., 1962, New York University; Bell Telephone Laboratories, 1960—. He was first engaged in the investigation of the statistical and spectral nature of digit simulation in TOUCH-TONE signaling systems. At present he is working on a development and testing program for the Videotelephone. Member, Eta Kappa Nu, Tau Beta Pi and Phi Beta Kappa.

Paul T. Brady, B.E.E., 1958, Rensselaer Polytechnic Institute; M.S.E.E., 1960, Massachusetts Institute of Technology; Bell Telephone Laboratories, 1961—. His work in human factors engineering has been concerned with studies of speech and voice-operated devices, especially as applied to satellite communication circuits.

Kenneth Bullington, B.S., 1936, University of New Mexico; M.S., 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 Head, Transmission Projects Engineering Department. 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 and Kappa Mu Epsilon.

Charles J. Byrne, B.S.E.E., 1957, Rensselaer Polytechnic Institute; M.S., 1958, California Institute of Technology; Bell Telephone Laboratories, 1958–1962; Bellcomm, Inc., 1962—. At the Laboratories he investigated fast transistor logic, instrument noise in seismometers, and synchronization of digital systems. At Bellcomm he is engaged in studies of photographic reconnaissance systems and systems for Apollo site certification. Member, IEEE, Sigma Xi, Eta Kappa Nu and Tau Beta Pi.

Harold E. Curtis, B.S. and M.S., 1929, Massachusetts Institute of Technology; American Telephone & Telegraph Co., 1929–34; Bell Telephone Laboratories, 1934—. He has specialized in work on transmission problems related to multichannel carrier telephony, including microwave radio relay, coaxial cable and waveguide systems.

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 electronics. He holds more than 20 patents in these fields. Fellow, IEEE; member, AIAA.

M. DiDomenico, Jr., B.S., 1958, M.S., 1959, Ph.D., 1963, Stanford University; Bell Telephone Laboratories, 1962—. He has been engaged in investigations on electro-optics and electro-optic light modulators. He has also worked on photoconductive detectors of microwave modulated light, and has been concerned with the physical processes involved in solid-state photodetectors. Member, American Physical Society, IEEE, Sigma Xi and Tau Beta Pi.

J. W. Emling, B.S. in E.E., Univ. of Pennsylvania, 1925; Development and Research Department of American Telephone and Telegraph Co., 1925–34; Bell Telephone Laboratories, 1934—. While at A.T.&T.,

Mr. Emling was particularly concerned with transmission standards and with developing a system of effective transmission rating. He continued this work at Bell Laboratories. In World War II he was concerned with studies in the field of underwater acoustics. Subsequently he has been concerned with systems engineering studies in the fields of engineering economy, voice-frequency transmission, rural carrier, radio and television. He is currently Executive Director of the Transmission Systems Engineering Division, with responsibility for the systems engineering aspects of transmission over wire and radio. Member, Acoustical Society of America, IEEE, Eta Kappa Nu and Tau Beta Pi.

Louis H. Enloe, B.S., 1955, M.S., 1956, Ph.D., 1959, University of Arizona; Bell Telephone Laboratories, 1959—. As a member of the radio systems research department, he has worked in the field of modulation and noise theory with particular emphasis on problems associated with space communication. Member, IEEE, Tau Beta Pi, Sigma Xi, Pi Mu Epsilon, Sigma Pi Sigma and Phi Kappa Phi.

Gerald D. Haynie, B.S., 1956, Virginia Polytechnic Institute; M.E.E., 1961, New York University; Bell Telephone Laboratories, 1956—. Mr. Haynie has been engaged in the transmission measurements development area and at present is supervisor of a group concerned with the automation of laboratory measurement systems. Member, IEEE, Tau Beta Pi and Eta Kappa Nu.

George K. Helder, B.S. (Business), 1952, B.S.E.E., 1958, University of Colorado; M.E.E., 1960, New York University; Bell Telephone Laboratories, 1958—. He was first engaged in exchange area transmission, including methods of subscriber loop testing. More recently he has been concerned with the problems of echo control on telephone connections. At present, he supervises a group dealing with the transmission aspects of the toll telephone network. Member, Tau Beta Pi, Eta Kappa Nu and IEEE.

D. W. Hill, B.S.C.E., 1951, Duke University; M.S.C.E., 1956, California Institute of Technology; Ph.D., (Engineering Mechanics), 1960, Stanford University; Bell Telephone Laboratories, 1959–63; Assistant Professor of Engineering Mechanics, Duke University, 1963—. His first assignment was the study of submarine cable dynamics. This was followed by work on attitude control problems of satellites, in-

cluding the system of attitude determination and control used in the Telstar experiments. Member, Sigma Xi and Tau Beta Pi; associate member, ASME.

BARRY J. KARAFIN, B.S.E.E., 1961, Moore School of University of Pennsylvania; M.E.E., 1963, New York University; Bell Telephone Laboratories, 1961—. He was first engaged in the study of systematic jitter in a chain of digital regenerators. Since then he has worked on voltage-controlled oscillators, and he is currently working on computer languages and compilers.

EDMUND T. KLEMMER, B.S., 1944, Webb Institute of Naval Architecture; M.A., 1949, Ph.D., 1952, Columbia University; Bell Telephone Laboratories, 1962—. He has studied customer dialing behavior with particular emphasis on the frequency and types of errors made in dialing. He has also developed a preference scaling method based on the proximity scaling approach. Most recently Mr. Klemmer has been concerned with the influence of satellite transmission delay and echo suppressor action upon the quality of telephone transmission. Fellow, Society of Engineering Psychologists; member, American Psychological Association, Human Factors Society and Sigma Xi.

TINGYE LI, B.Sc., 1953, University of Witwatersrand (South Africa); M.S., 1955, and Ph.D., 1958, Northwestern University; Bell Telephone Laboratories, 1957—. He has been engaged in studies of microwave antennas and microwave propagation. Recently he has been primarily concerned with work on optical masers. Member, IEEE, Eta Kappa Nu and Sigma Xi.

JACK M. MANLEY, B.S. (Electrical Engineering), 1930, University of Missouri; Bell Telephone Laboratories, 1930—. He was first concerned with theoretical and experimental studies of nonlinear electric circuits. He later worked with new multiplex methods for communication systems, including early research work on PCM. Afterward, he was engaged in transmission line research, and at present he is working on noise problems in digital transmission systems. Fellow, IEEE; member, Sigma Xi, Tau Beta Pi and Eta Kappa Nu.

STEWART E. MILLER, B.S. and M.S., 1941, Massachusetts Institute of Technology; Bell Telephone Laboratories, 1941—. He first worked on coaxial carrier repeaters and later shifted to 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 the fields of circular electric waveguide communication, microwave ferrite devices, and other components for microwave radio systems. As Director, Guided Wave Systems Research, he heads a group engaged in research on communication techniques for the millimeter wave and optical regions. Fellow, IEEE.

Doren Mitchell, B.S., 1925, Princeton University; American Telephone & Telegraph Co., 1925–34; Bell Telephone Laboratories, 1934—. Mr. Mitchell's early work was concerned with field studies of transmission on long telephone and radio circuits, including work on various types of voice-operated devices. During World War II he worked on military projects, including transmission systems and the problem of laying wire from airplanes. He also founded the Somerset Mechanics School to provide vocational training to residents of that county. Since the war, he has worked on radio systems and data transmission systems. Now working on satellite communication systems as Head, Satellite Systems Studies Department. Fellow, IEEE; licensed professional engineer; member, AFCEA and AAAS.

Robert R. Riesz, A.B., 1924, Ripon College; M.A. (Physics), 1926, University of Wisconsin; Bell Telephone Laboratories, 1926–63. His earliest work was on vibratory mechanics, which led to research in the physics of speech and hearing, including such projects as the artificial larynx and visible speech. Prior to and during World War II, he was engaged in developing speech processing systems such as the Voder and Vocoder. More recently he engaged in the field of human factors as applied to telephone systems, including the development of simulation as a means of studying user reaction to new communications systems. Since his retirement from the Laboratories, he has been Associate Professor, Department of Physics, Union College, Barbourville, Kentucky. Fellow, American Physical Society; Senior Member, IEEE, and Chairman of Professional Group on Human Factors in Electronics; member, Human Factors Society.

Dudley B. Robinson, Jr., B.S.E., 1950, M.S.E., 1951, Princeton University; Bell Telephone Laboratories, 1954—. He first engaged in exchange carrier transmission systems studies. He has since worked on design of test equipment used on early PCM field trials and later used for T-1 carrier trials. At present he is engaged in the study of a high-

speed PCM coder-decoder for use with FDM (frequency division multiplex) and TV signals, and field tests of the coder-decoder.

PETER E. ROSENFELD, Sc.B., 1957, Brown University; M.S., 1959, Harvard University; Bell Telephone Laboratories, 1959—. Mr. Rosenfeld's first assignment with the Laboratories was on the design of the 20–20,000-cps automated transmission measuring set. He is presently engaged in the design of an automated set which covers the frequency range from 20 cps to 250 mc and uses an on-line digital computer to perform the control functions. Member, Tau Beta Pi.

IRWIN W. SANDBERG, B.E.E., 1955, M.E.E., 1956, and D.E.E., 1958, Polytechnic Institute of Brooklyn; Bell Telephone Laboratories, 1958—. He has been concerned with analysis of military systems, particularly radar systems, and with synthesis and analysis of active and time-varying networks. He is currently involved in a study of the signal-theoretic properties of nonlinear systems. Member, IEEE, Society for Industrial and Applied Mathematics, Eta Kappa Nu, Sigma Xi and Tau Beta Pi.

D. T. YOUNG, B.S., 1956, M.E.E., 1960, University of Oklahoma; Bell Telephone Laboratories, 1960—. He initially worked on mode conversion problems in multimode waveguides. At present he is working on a solid state repeater for a waveguide transmission system. Member, IEEE, Tau Beta Pi, Eta Kappa Nu and Sigma Xi.