

Contributors to This Issue

Cleo D. Anderson, B.S.E.E., 1960, University of Idaho; M.E.E., 1962, New York University, Bell Laboratories, 1960—Mr. Anderson was involved in systems analysis of the SD and SF undersea cable systems. He then supervised a high-frequency radio group designing facilities for handling overseas and high-seas traffic. Returning to undersea cable work, he was responsible for circuit design of repeaters and the repeater monitoring set for the SG system. Currently, he supervises a group responsible for analyses of undersea cable systems. Member, IEEE, Sigma Tau, Phi Kappa Phi, Eta Kappa Nu.

Sheila Ayers, Birkbeck College, London University; British Post Office, Research Department, 1943—. Ms. Ayers has investigated non-linear resistors, piezoelectricity, ferroelectricity, magnetostriction, electro-optics, and low-loss dielectrics. Since 1973, she has been head of a group investigating materials problems in submarine cables and measurement techniques associated with these investigations.

S. Theodore Brewer, B.S. (E.E.), 1937, M.S. (E), 1938, Purdue University, Bell Laboratories, 1937—. In his early assignments, Mr. Brewer contributed to the development of broadband coaxial systems and video feedback amplifiers. Later, he explored network control for electronically-controlled switching systems. More recently he was responsible for system and undersea electronics design of the SF Undersea Cable System. Currently, he heads a department which was responsible for system and undersea electronics design for the SG Undersea Cable System. Exploratory work under his direction includes an undersea system of 16,000 channels' capacity. He holds patents on control and feedback systems, switching networks, and repeater circuits. Member, IEEE, Eta Kappa Nu, Tau Beta Pi, Sigma Xi.

Michael Brouant, graduate, Ecole Nationale Supérieure de l'Aéronautique, Paris, 1962; CIT-Alcatel, 1964—. At CIT-Alcatel, Mr. Brouant worked on the design of analog line equipment. Since 1968, he has directed the Undersea Terminal Design Section which has carried out detailed design of terminals for the French S1, S5, and S25 systems, as well as the 60-MHz land system. He also was responsible for detailed design of terminals for the SG undersea cable system. In 1975, he took charge of the lightwave transmission section which is developing applications of optical fibers to telecommunications.

Edwin T. Calkin, B.S. (Eng.), 1961, the Cooper Union School of Engineering; M.S.E.E., 1963, New York University; Bell Laboratories, 1961—. From 1964 to 1975, Mr. Calkin was principally engaged in circuit development for power converters that energize land and undersea cables. Since 1975, he has been responsible for circuits in low- and medium-power converters used in a variety of Bell System applications. Member, IEEE, AES, and Tau Beta Pi.

Christian Chalhoub, graduate, Ecole Supérieure d'Electricité, Paris, 1941. Mr. Chalhoub started his career in the Société d'Etudes pour Liaisons Téléphoniques where he first worked on measurement technology and later on equipment for studio broadcasting. He worked briefly for a firm concerned with medical electronics and then, in 1945, joined CNET (Centre National d'Etudes des Télécommunications), where he was responsible for the laboratory studying high-frequency terminal transmission equipment for carrier systems. In 1956 he joined CIT (Compagnie Industrielle des Télécommunications), a subsidiary of CGE (Compagnie Générale d'Electricité), where he managed the department designing line systems for both land and undersea use. He is currently Deputy Director in charge of Product Policy in the Transmission Division of CIT. Member, SEE (Société des Electriciens, des Electroniciens et des Radioélectriciens).

J. E. H. Cosier has been with the British Post Office Research Department for 41 years, the last 32 on undersea repeater systems. His work has covered the field of housings, high pressure seals, undersea cable jointing methods, terminations and taut wire equipment. He is a co-inventor and patentee of the British design of the linear cable engine, and of the cut-and-hold grapnel. Since 1972, he has been Head of the Mechanical Design and Shipboard Laying Equipment Section of the Research Department.

A. Peter Davies, British Post Office. Mr. Davies started as a telecommunications apprentice on automatic switching in a London telephone district in 1936. He shifted to cable transmission early in World War II, seeing Army service on the undersea cables laid to serve the European front. Later, he was involved with the development of the U.K. coaxial cable network begun about 1948, transferring to undersea cables in 1962, where he has remained ever since. His interests include the practical application of submerged repeater technology in the marine environment. He is presently Head of the BPO section responsible for undersea plant development, installation, and maintenance.

S. W. Dawson, Jr., B.E.E., 1968, University of Virginia; M.S.E.E., 1970, Duke University; Bell Laboratories, 1968—. Mr. Dawson worked on specialized test equipment design for military undersea cable systems before his work on the SG system installation test equipment. He is currently engaged in military hardware systems design. Member, Tau Beta Pit, Eta Kappa Nu.

Paul Delage, graduate, Ecole d'Electricité Industrielle, Paris, 1942. Mr. Delage entered the Société d'Etudes pour Liaisons Téléphoniques et Télégraphiques à Longue Distance in 1942, where he worked on measurement, installation, and splicing of long-distance cables. Following this, he worked in the Alcatel Laboratories, which later became CIT-Alcatel, developing multi-channel analog transmission equipment. This work extended from channel banks to equipment for the 60-MHz coaxial system. He is now Deputy Head of the Analog and Digital Multiplex Laboratories.

Robert L. Easton, B.S. (M.E.), 1953, M.S. (M.E.), 1954, California Institute of Technology; Bell Laboratories, 1954—. Mr. Easton was responsible for system aspects of the earlier SD and SF Submarine Cable Systems. In the development of the SG system, he was responsible for economic studies, signal analysis, and equalization. Currently, he heads a group concerned with undersea system planning and studies associated with a new time-assignment speech interpolation system. Member, Tau Beta Pi.

Robert D. Ehrbar, B.S.E.E., 1937, Johns Hopkins University; Bell Laboratories, 1937—. When he joined Bell Laboratories, Mr. Ehrbar worked on cable carrier systems. During World War II, he helped develop various airborne radar systems and after the war worked on the development of a high-capacity coaxial cable system. In 1955 he became Head, Submarine Cable Systems Department and in 1964 Head, Exchange Transmission Department. In December 1968, he was appointed Director, Exchange Transmission Laboratory and in April 1971, Director, Undersea Cable Laboratory. Member, IEEE.

Arthur E. Ford, British Post Office Research Laboratories, 1938—. Early in his career Mr. Ford was engaged in precision HF techniques, and in the evolution of sweep-frequency scanning and white noise measurement. He left the Research Laboratories in 1962, and joined the Telecommunications Headquarters Division, planning and laying those world-wide undersea cable systems in which the BPO had an interest. He currently heads this division. He was honored by her Majesty Queen

Elizabeth II with the award of Order of the British Empire in 1976 for his services to undersea cables.

W. M. Fox, B.S., 1951, Muhlenberg College; M.S., 1953, St. Lawrence University; The Franklin Institute Laboratories, 1953-1957; Bell Laboratories, 1957—. Mr. Fox has been engaged in transistor development, including devices for the SF and SG undersea systems. Currently, he is working on the development of linear high-frequency power transistors and on low-power, low-noise transistors.

Guy Gerbier, graduate, Ecole Polytechnique of Paris, 1954; Ecole Nationale Supérieure des Télécommunications of Paris, 1957. Upon completing his studies, Mr. Gerbier joined CNET (Centre National d'Etudes des Télécommunications), where he worked on the qualification of components for electronic switching and electronic automatic controls. Next, he headed the Department of Research in Postal Mechanization and later assumed responsibility for the CNET Division of Postal Mechanization. In 1969, he joined the Transmission Lines and Equipment Division of CNET as Deputy Director, and later became Division Director. In this responsibility, he worked on cables and their final realization, long-distance transmission systems, and local networks. Currently, as General Engineer he is responsible for the ground communications network of the French Navy. Member, SEE (Société des Electriciens, des Electroniciens et des Radioélectriciens).

R. F. Gleason, B.S., Engineering Science, 1961, Case Institute; M.S., Engineering Mechanics, 1963, N.Y.U.; Ph.D., 1967, Stanford University. Bell Laboratories, 1961—. At Bell Laboratories, Mr. Gleason has worked on undersea cable system physical design. He has been responsible for stress and vibration analysis of repeaters and equalizers and for design of high pressure feed-through terminals for undersea use. He presently supervises a group with responsibilities including cable and cable termination design, and development of cable handling equipment and methods.

Igor Goloto, M.E. 1961, Stevens Institute of Technology; M.S.M.E., 1963, New York University; Bell Laboratories, 1961-1977. Mr. Goloto was a member of the Power Systems Physical Design Department until his death in April 1977. He was responsible for the physical design of power converters for carrier and microwave systems, for No. 1 ESS, and for the SF, SG, and military undersea cables.

Douglas N. Harper. Mr. Harper joined the British Post Office in 1946. Since 1961, he has been involved in determining intercontinental transmission standards for both cable and satellite facilities and has been responsible for overall planning and preparation of specifications for a number of major submarine cable system projects. These include U.K.-Portugal, MAT 1 and several U.K.-European cables. During the procurement of MAT 1 he was a consultant to Italcable for the detailed planning, installation, and commissioning of the system. More recently, Mr. Harper has been involved in the SG cable system development, particularly in the terminal transmission equipment area, and in commissioning the TAT-6 system. Currently he is Head of the Trans-Atlantic Systems Planning Group, with specific responsibilities as the BPO Coordinator for the TAT-7 project.

W. E. Hower, B.S.(E.E.), Newark College of Engineering; M.S. (Management Science), Stevens Institute of Technology; Western Electric, 1961—. Mr. Hower began in Western Electric with assignments in industrial engineering and test set development. He was promoted to Department Chief in 1969 and in December of that year assumed responsibility for undersea cable repeater assembly and test engineering. He is currently responsible for customer-premise power engineering in Kearny.

J. J. Kassig, B.S.E.E., 1952, Massachusetts Institute of Technology; M.S.E.E., 1955, Rutgers University; Bell Laboratories, 1955—. Mr. Kassig has worked on the design of repeaters for the SD, SF, and SG undersea systems. He has also been involved in the areas of semiconductor device characterization, in network optimization techniques using digital computers, and in the application of signal flow graphs to the design of feedback amplifiers. He is currently exploring design of a high-speed regenerator for an undersea optical fiber system.

F. E. Kirkland, B.S.E.E., 1957, Auburn University; Western Electric, 1957-1962; Bell Laboratories, 1962-1976; American Telephone and Telegraph Company, Long Lines Department, 1976—. Mr. Kirkland's early work at Western Electric involved preparation of technical publications. Subsequently, he was engaged in design and development of Naval surface weapons direction equipment, first with Western Electric, then at Bell Laboratories. In 1973, he began design work on new generation undersea cable laying test equipment which was being developed for the SF and SG systems. He participated extensively in the installation

of the HAW-3/TRANSPAC-2 links, and the TAT-6 project. At American Telephone and Telegraph Company, Long Lines, Overseas, he is currently involved with various transmission measurement systems.

Victor M. Krygowski, B.S.M.E., 1942, N.J. Institute of Technology, M.S. (Engineering Management), 1951, Stevens Institute of Technology; Western Electric, 1946—. Mr. Krygowski's areas of responsibility have covered engineering, shop, inspection and testing, quality control, data processing, production service, and plant maintenance. Among the items worked on were PBXs, key equipment, and apparatus and piece parts. He was promoted to Department Chief in Manufacturing Engineering in 1955 and to Assistant Manager in 1959. From 1972 to 1975, Mr. Krygowski was Engineering Assistant Manager in the undersea cable repeater shops in Clark, N.J., where he was responsible for manufacturing and planning for the SDC, SF, and SG undersea repeaters and equalizers. He is presently Assistant Manager, Industrial Engineering and Wage Practices at the Kearny Works.

Bror O. Larson, B.S.E.E., 1958, Pennsylvania State University; M.S.E.E., 1960, New York University; Bell Laboratories, 1958—. Mr. Larson participated in the Telstar satellite development, with responsibility for the command tracker and command transmitter systems. Subsequently, he was involved in the development of single-sideband radio transmitters for the high-seas and point-to-point services maintained by the Long Lines Department of AT&T. He prepared the detailed test specifications and procedures for the installation and the final system alignment and evaluation of the SG Undersea Cable System, and participated in the commissioning of TAT-6. Currently, he is a member of the Undersea Cable Laboratory. Member, IEEE, Eta Kappa Nu, Phi Kappa Phi, Tau Beta Pi.

Michel Laurette, graduate, Ecole Polytechnique de Paris and Ecole Nationale Supérieure des Télécommunications; Centre National D'Etudes Des Télécommunications (CNET), 1967—. Mr. Laurette has participated in the development of French analog transmission systems, including a 60-MHz terrestrial facility and a 25-MHz undersea system. He participated in the SG system project, primarily with regard to the terminal equipment and final system alignment and evaluation of the TAT-6 link. Currently, as Transmission Engineer, he heads the Line and Transmission Equipment Engineering Department at CNET. Mr. Laurette is a member of CCITT, where he is the French representative for Study Commission XV.

Robert L. Lynch, A.S., Kansas City (Missouri) Junior College; B.S.E.E., 1957, Kansas University; M.E.E., 1959, New York University; Bell Laboratories, 1957—. Mr. Lynch's early work included development of cable machinery for the Bell System Cable Ship *Long Lines* and design

of transmission equipment for the shore terminals of the SD and SF undersea cable systems. His first supervisory responsibilities concerned the physical design of the SF system terminal transmission equipment and of the TASI-B system. Subsequently, he was assigned responsibility for the complete SF transmission terminal. More recently, his group has been responsible for a number of facets of SG undersea cable system design including undersea equalization and the testing procedures used during cable laying and commissioning. He provided liaison with the British and French Post Offices on these matters, and, in particular, with CIT-Alcatel during development of the SG terminal transmission equipment. He participated extensively in the installation of the TAT-6 link.

T. A. McKenzie, B.S.E.E., 1955, University of Tennessee; Bell Laboratories, 1955–1978. Initially, Mr. McKenzie worked on military undersea cable systems. In the SG development, he was responsible for the design of specialized test equipment. He retired from Bell Laboratories in 1978. Member, Phi Eta Sigma, Eta Kappa Nu, Tau Beta Pi, Phi Kappa Phi.

Geoffrey E. Morse, C. Eng.; British Post Office, Research Department, 1944—. Initially, Mr. Morse was concerned with the design of the British 0.99-in. and 1.47-in. lightweight cables. Since 1956, he has been engaged in undersea cable development. At commencement of the SG project, he became head of the cable group. Member, I.E.R.E.

Paul R. Munk, B.S.E.E., 1951, Purdue University; M.S.E.E., 1952, Purdue University; Bell Laboratories, 1952—. At Bell Laboratories, Mr. Munk designed inductors and transformers for a number of Bell System and military applications, including the Telstar satellite and undersea cable systems. He is currently developing computer software for the Mechanized Loop Testing System. Member, Eta Kappa Nu, Sigma Xi.

G. A. Reinold, B.S.M.E., 1962, Union College; M.S.M.E., 1964, New York University; Bell Laboratories, 1962—. Mr. Reinold was first involved in the development of undersea cable installation and repair techniques. He later worked on methods for installing cables underground with minimal soil disturbance. He then participated in ocean cable design for the military. In 1969, he became supervisor of the undersea apparatus mechanical design group, where he was responsible for the physical design of the SG repeater. He is currently responsible for the physical design of future undersea cable repeaters and for the cable location system on the SCARAB submersible.

Eugene F. Sartori, B.S., 1942, Massachusetts Institute of Technology; M.S., 1961, Stevens Institute of Technology; Bell Laboratories, 1942—. Mr. Sartori was initially concerned with the design of magnetic apparatus for both military and Bell System applications. He was responsible for high-reliability transformer design for the Telstar satellite and for undersea cable systems. He is presently involved in terminal equipment studies and subscriber loop maintenance.

William J. Schatz, B.S. (E.E.), 1965, New Jersey Institute of Technology; Bell Laboratories, 1958—. Since 1965, Mr. Schatz has been involved in circuit development in the Electronic Power Systems Laboratory.

Robert E. Schroeder, B.S.E.E., 1975, New Jersey Institute of Technology; Bell Laboratories, 1967—. Mr. Schroeder has been responsible for circuit development of dc-dc converters and regulators used in the T2 carrier system, the power converters for the SG undersea cable system, and recent exploratory work on high-power dc-dc converter plants.

Daniel S. Shull, B.S.E.E., 1951, University of South Carolina; M.S.E.E., 1960, Carnegie Institute of Technology; Ph.D., 1965, Carnegie Institute of Technology; Bell Laboratories, 1964—. Mr. Shull joined Bell Laboratories with the Power Apparatus Department in Winston-Salem, N.C., where he was involved in the development and design of magnetic devices and power equipment for defense applications. Upon his transfer to the SG Installation Equipment Group in 1971, he assumed responsibility for the development and design of SG-terminal-PSF equipment for both cable installation use and permanent system operation. Since 1974, he has been assigned to the Local Electronic Switching Systems Development Laboratory. He is a senior member of the IEEE, and has served on the Administrative Committee of the IEEE Magnetics Society, and is a past chairman of the technical program committee of the IEEE International Magnetics Conference. Member, Tau Beta Pi, Phi Beta Kappa.

Henri Soulier, graduate, Ecole Polytechnique, Paris, 1958; Ecole Nationale Supérieure des Télécommunications, Paris, 1961. Mr. Soulier began his career at CNET (Centre National d'Etudes des Télécommunications) working on semiconductors. Since joining the Transmission Department of CNET in 1964, his activities have concerned analog transmission: multiplex equipment and particularly system design for coaxial cable facilities, both land and undersea. He was responsible for

planning and specifying the terminal transmission equipment of the SG system. Appointed Chief Engineer in August 1972, he is now Deputy Director of the Cable and Microwave Radio Transmission Division. Member, SEE (Société des Electriciens, des Electroniciens et des Radioélectriciens).

J. R. Stauffer, B.S.E.E., 1962, Purdue University; M.S.E.E., 1964, New York University; Bell Laboratories, 1962—. Mr. Stauffer worked on various aspects of the SF undersea cable repeater, and subsequently supervised a group that developed trunk electronics for military systems. Working with the British Post Office, his group assisted in characterizing the transmission properties of cable use in the SG undersea system. Recently, Mr. Stauffer has been investigating the possibility of applying fiber optics to undersea cable systems. Member, Tau Beta Pi, Eta Kappa Nu.

S. A. Taylor, B.S.C. (Tech.), 1950, Manchester University, England; British Post Office, Research Department, 1950—. Initially, Mr. Taylor worked on the development of wideband feedback amplifiers and the electrical design of submarine repeaters. He is currently head of the Submarine and Inland Cable Systems Division of the Research Department. Member, IEE.

P. A. Yeisley, Jr., B.S. (Physics), 1952, Lafayette College; Bell Laboratories, 1952—. Mr. Yeisley first worked on the development of the L3 coaxial cable system. Since 1954, he has worked on the physical design of the SB, SD, SF, and SG undersea cable systems.

W. H. Yocom, B.A. (Physics), 1940, Oberlin College; S.B. (Electrical Engineering), 1942, Massachusetts Institute of Technology; M.S. (Electrical Engineering), Stevens Institute of Technology; Bell Laboratories, 1942–1956, 1964—. Mr. Yocom had assignments in physical design of radar and test equipment, then studied electron dynamics and did research on traveling wave tubes and optical delay lines. Later he supervised a group developing tantalum thin-film hybrid circuits, and now supervises a group that coordinates the application and design of discrete passive electronic components. Senior Member, IEEE, Sigma Xi.

