Contributors to This Issue

EDWARD J. AITCHESON, B.S.E.E., 1962, Virginia Polytechnic Institute; M.S., 1964, Rutgers University; Bell Telephone Laboratories, 1962—. Mr. Aitcheson has been a member of the No. 1 ESS ADF Maintenance Planning and Development Department since 1967. At the present time, he is involved in maintenance planning for No. 4 ESS. Member, Tau Beta Pi, Eta Kappa Nu, Sigma Xi, Phi Kappa Phi, Kappa Theta Epsilon.

CYRUS F. AULT, B.E.E.E., 1950, University of Southern California; M.S., 1955, Stevens Institute of Technology; Bell Telephone Laboratories, 1955—. Mr. Ault has worked on ESS memory and circuit design since 1955. Member, IEEE, Eta Kappa Nu, Tau Beta Pi.

WILLIAM A. BAKER, B.E.E., 1953, Manhattan College; M.E.E., 1960, New York University; Bell Telephone Laboratories, 1953—. Mr. Baker was involved initially in the design of magnetic power apparatus. After a leave of absence to serve in the Civil Engineer Corps, U. S. Navy, he became involved in power supply design and magnetic memory development. He is presently Supervisor of the Memory and Digital Network Group. Member, Pennsylvania Society of Professional Engineers, IEEE, Eta Kappa Nu; Associate Member, Naval Institute.

W. R. BALDINGER, B.S.C.E., 1933, University of Illinois; Western Electric Company, 1935–1949; Bell Telephone Laboratories, 1949—. Mr. Baldinger initially worked on the development of equipment for local switching systems. Later he supervised a group responsible for the development of equipment for Automatic Message Accounting, Common Control and *Touch-Tone®* calling features. Since 1962, Mr. Baldinger has been Supervisor of a group working on the design of electronic equipment for TSPS No. 1.

DUANE R. BARNEY, B.S.E.E., 1936, Newark College of Engineering; M.S.E.E., 1938, Massachusetts Institute of Technology; Western Electric Company, 1940–1949; Bell Telephone Laboratories, 1949—. Mr. Barney's first work concerned system design of weapon direction systems for Navy use. He later supervised a group responsible for testing and operation of a military electronic switching system and the ADF system. He presently supervises a group working on test model design for No. 4 ESS.

ADAM C. CARNEY, B.S.E.E., 1962, Polytechnic Institute of Brooklyn; M.E.E., 1964, New York University; Bell Telephone Laboratories, 1962—. In addition to the work described in this issue, Mr. Carney has been engaged in the development of four-phase data sets and the exploratory design of a voice-excited vocoder. He is presently concerned with the physical design of data communications systems. Member, Eta Kappa Nu, Sigma Xi, Tau Beta Pi.

G. T. CLARK, B.S.M.E., 1952, Bradley University; Western Electric Company, 1956–1961; Bell Telephone Laboratories, 1961—. Mr. Clark was first engaged in the physical design of Step-by-Step Common Control equipment and later worked on the design of 758C PBX equipment. He has coordinated the physical design of TSPS No. 1 equipment, including detail design of network and position subsystem switching equipment. He is currently working on physical design of new features for TSPS No. 1.

W. K. COMELLA, B.S.E.E., 1963, University of Colorado; M.S.E.E., 1965, Columbia University; Bell Telephone Laboratories, 1963—. Mr. Comella worked on design of circuits for PBX-Automatic Identified Outward Dialing and then maintenance programming for TSPS. He is Supervisor of the group responsible for network and trunk maintenance programs for the Automatic Intercept System. Member, IEEE, Eta Kappa Nu, Tau Beta Pi.

RICHARD F. COOK, B.S.E.E., 1953, Northeastern University; Bell Telephone Laboratories, 1953—. Mr. Cook's work has included circuit and system design of military switching and communications systems. More recently he has been engaged in the maintenance development and planning for the No. 1 ESS ADF and the No. 4 ESS. Member, Eta Kappa Nu, Tau Beta Pi.

JOSEPH E. CORBIN, B.S.E.E., 1930, Pennsylvania State University; Bell Telephone Laboratories, 1930—. Mr. Corbin first worked on radio receiver and radio distribution systems for apartment houses and hotels. He later was engaged in work on aircraft receivers and the development of the receiver for the Coastal Harbor system. During World War II he worked on communication equipment and fire-control radar. He then was involved in work on commercial radar for Great Lakes ore boats and supervised groups involved in the Navy Intercept study, the APS-64 bombing system, and the Doppler spectrum analyser for the DEW Line. He later supervised groups that developed circuits and logic for NIKE-ZEUS and the Time-Division Switch for UNICOM. He was responsible for the design of Input/Output for No. 1 ESS ADF. Currently he is responsible for the Time Division Grid for No. 4 ESS Toll. Member, Eta Kappa Nu, Sigma Tau.

G. A. CULP, A.A.S. (Electrical Engineering), 1962, DeVry Technical Institute; Bell Telephone Laboratories, 1962—. Mr. Culp has worked in the No. 5 Crossbar and No. 4 Toll Crossbar Physical Design departments. With the Toll Crossbar Department, he has been active in the development of the SPC No. 1A Piggyback Twistor Store and the No. 4 Toll Electronic Translator System. He is currently engaged in the development of Common Channel Interoffice Signaling.

CHESTER M. DAY, JR., B.A., 1958, Bowdoin College; B.S.E.E. and M.S.E.E., 1958, Massachusetts Institute of Technology; Bell Telephone Laboratories, co-op 1956–1958, 1958—. Mr. Day's early work was in the research area on remote maintenance for No. 5 Crossbar Offices, switching logic using cylindrical thin films, and a broadband switching system for the *Picturephone*® visual telephone system and data. He subsequently supervised the group which developed the central office portion of AIOD and did the exploratory development for the small AIOD system. Since 1966, he has worked on peripheral unit maintenance programming for TSPS No. 1. Member, Sigma Xi, Eta Kappa Nu, IEEE, ACM.

G. RAY DURNEY, B.S.E.E., 1962, University of Utah; M.S.E.E., 1964, Rutgers University; Bell Telephone Laboratories, 1962–1970. During his career at Bell Laboratories, Mr. Durney was engaged in the development of circuitry associated with the Stored Program Control Processor and Peripheral Circuits.

JAMES C. EWIN, B.S. (M.E.), 1950, University of Maryland; O. S. Peters Co., Washington, D. C., 1950–53; U. S. Army, Ballistics Research Laboratory, Aberdeen Proving Ground, Md., 1953–55; Bell Telephone Laboratories, 1955—. Mr. Ewin worked for ten years in the Switching Systems Engineering Division on line concentrators, Wide Area Data Service and No. 2 ESS. He is currently Head of the Data Systems Planning Department with responsibility for identifying potential data services based on customer needs, for analyzing maintenance operations, for providing economic and service models to evaluate data services and maintenance strategies and for providing requirements on test equipment and new data systems of which No. 1 ESS ADF was a particular case.

S. M. FITCH, B.S.E.E., 1960, and M.S.E.E., 1962, Purdue University; Bell Telephone Laboratories, 1963—. Mr. Fitch has worked on the development of data stations for message-switching applications, most recently as a supervisor in the Data Communications Systems Laboratory. He is currently attending New York University under sponsorship of the Doctoral Support Plan. Member, IEEE, Eta Kappa Nu.

PAUL K. GILOTH, B.A., 1942, Beloit College; B.S.E.E., 1947, Northwestern University; Illinois Bell Telephone Company, 1947–1950; Bell Telephone Laboratories, 1951—. Mr. Giloth worked initially on analog computer simulators for military applications. Following this he supervised development of a transistorized bombing and navigation system and the guidance computers for the NIKE-ZEUS ABM system. In 1961 he was appointed Head of the UNICOM Test Model Department and was responsible for digital terminal equipment and the store and forward message portion of the UNICOM system. In 1963 he became Head of the Data Switching Systems Department and was responsible for development of the No. 1 ESS ADF Data Switching System. As Head of the No. 1 ESS AUTOVON Department, he is now responsible for AUTOVON development and support programming and testing for No. 4 ESS. Member, IEEE, Sigma Xi.

JOHN A. HACKETT, B.S.E.E., 1959, University of Maine; M.S.E.E., 1961, New York University; Bell Telephone Laboratories, summer, 1958, 1959—. Mr. Hackett was first involved in improvements and additions to Step-by-Step circuits. Later he worked on improved main-

tenance of Step-by-Step offices using call-through testing and designed new permanent signal circuits for Step-by-Step offices. He also was engaged in the initial design of TSPS peripheral circuits. Presently he is Supervisor, TSPS No. 1 Position Subsystem Group. Member, IEEE, Tau Beta Pi, Phi Kappa Phi.

KENNETH A. HELLER, B.S.E.E., 1953, Lehigh University; Bell Telephone Laboratories, 1953—. Mr. Heller worked initially in the Military Electronics Area. He was later involved in work on the Navy Intercept Project, the SAGE air defense system, the TITAN ICBM system, and the UNICOM global military communication system. He supervised groups responsible for maintenance programming in electronic switching systems including UNICOM and No. 1 ESS ADF. Since 1966, he has worked on TSPS No. 1 and was Site Supervisor at the Morristown installation from the start of system testing throughout cutover. Since April 1969, he has been responsible for development of TSPS No. 1 growth procedures and recent change programs. Member, Pi Mu Epsilon, Eta Kappa Nu.

R. J. JAEGER, JR., B.A. (Math), 1951, Hofstra University; Bell Telephone Laboratories, 1951—. Mr. Jaeger started his Bell System career with the Long Lines Department in New York City in 1941. After serving as a Naval Aviator in World War II, he returned to Long Lines and in 1951 came to Bell Laboratories to do design work in the No. 4 Toll Crossbar System. He has worked on Toll Switching Systems, Telegraph Switching Systems, the Time Assignment Speech Interpolation (TASI) System used on overseas cables, the Panel and Step-by-Step Local Switching Systems, and in recent years Traffic Service Position System No. 1 (TSPS). He is Head of the Planning and Operational Programming Department (TSPS). Senior Member, IEEE; Member, Kappa Mu Epsilon, Sigma Kappa Alpha.

AMOS E. JOEL, JR., B.S., 1940, and M.S., 1942, Massachusetts Institute of Technology; Bell Telephone Laboratories, 1940—. Mr. Joel worked initially in the fields of relay engineering, crossbar system testing and in the fundamental development studies of telephone switching systems. During World War II, he was engaged in the design of circuits for early relay digital computers and for cryptographic and cryptanalysis machines. Subsequently, he was concerned with the preparation

of texts for and in the teaching of switching design, the design of automatic message accounting computer circuits, and the making of fundamental engineering studies of new switching systems. He was Head of a department responsible for the development planning of the Bell System's first electronic telephone switching systems. Mr. Joel served as Director of the Common Systems Switching Laboratory from 1961 to 1967. He is presently a Switching Consultant. Fellow, IEEE; Member-at-large, IEEE Communication Technology Group; Chairman of the Board of Directors, IEEE International Communications Conference; Member, IEEE Communication Switching Committee, Sigma Xi, Association for Computing Machinery, American Association for the Advancement of Science.

HERBERT W. KETTLER, B.S.E. (Physics), 1964, and M.S.E.E., 1965, University of Michigan; Bell Telephone Laboratories, 1966—. Mr. Kettler has worked on the TSPS peripheral recognition program and emergency action program design and implementation, support computer systems for switching laboratories and TSPS field support. Member, IEEE, ACM, Phi Kappa Phi, Tau Beta Pi.

A. W. KETTLEY, B.S.E.E., 1952, University of Vermont; Bell Telephone Laboratories, 1952—. Mr. Kettley was initially assigned to the Step-by-Step development group where he took part in current engineering for Step-by-Step, the development of *Touch-Tone*® calling for Step-by-Step, and the design of common control for Step-by-Step. He later supervised an exploratory development group investigating the modernization of Step-by-Step. During the TSPS development, he supervised several groups involved in software design and is currently in charge of the TSPS Operator Actions Programming Group.

HARRY G. KIENZLE, B.S.E.E., 1953, Dexel Institute of Technology; M.S. (Mathematics), 1961, Stevens Institute of Technology; Bell Telephone Laboratories, 1953—. Mr. Kienzle first participated in the design of bombing and navigational computers. Upon return from a two-year tour of duty with the U. S. Army Missile Research and Development Division, he was concerned with the development of the guidance computer for the NIKE-ZEUS ABM system. He later supervised a group responsible for system design of the UNICOM communication system

and then a group responsible for the operational programs for the No. 1 ESS ADF. He presently heads a department concerned with No. 4 ESS maintenance. Member, IEEE, Eta Kappa Nu, Tau Beta Pi, Phi Kappa Phi.

GEORGE W. KINDER, E.E., 1961, University of Cincinnati; M.E.E., 1963, New York University; C&P Telephone Company of West Virginia, 1958–1960; Bell Telephone Laboratories, 1961—. Mr. Kinder supervises a group engaged in the design of Peripheral System Units for various Bell System applications. Member, IEEE, Tau Beta Pi, Eta Kappa Nu.

H. R. LEHMAN, B.S.E.E., 1962, New York University; M.S.E.E., 1964, New York University; IBM Watson Research Center, 1965–1966; Bell Telephone Laboratories, 1962–1965, 1966—. Mr. Lehman has worked in circuit and logic design in the development of electronic data switching systems. He is currently engaged in the design of high-speed switching systems. Member, Tau Beta Pi, Eta Kappa Nu.

FRANK H. MYERS, B.S.M.E., 1958, and M.S.E.E., 1960, Ohio University; Bell Telephone Laboratories, 1960—. Initially Mr. Myers was involved in the development of the switching network and crosspoint for No. 1 ESS. He then supervised the development of the P.B.T. store. Currently he supervises a group that is developing computerized facilities for development and production testing. Senior Member, IEEE.

KEITH L. NICODEMUS, B.S.E.E., 1952, University of Iowa; M.S., 1959, Stevens Institute of Technology; Bell Telephone Laboratories, 1952—. Mr. Nicodemus has worked on system development aspects of the acquisition radar for NIKE-ZEUS and on the logic design of the Time Division Switch for UNICOM. On the No. 1 ESS ADF project, he has worked on the Buffer Control design specifications, system coordination, design of audit programs and the debugging of system program and equipment. Since February 1970, he has been working with the logic design of equipment for the No. 4 ESS project. Member, IEEE, Tau Beta Pi.

G. PARKER, B.E.E., 1953, Brooklyn Polytechnic Institute; Graduate of Communications Development Training Program, Bell Telephone Laboratories, 1956; M.S.E.E., 1961, Columbia University; Bell Telephone Laboratories, 1953—. Mr. Parker has worked on teletypewriter station and central office control circuits and data sets. He is currently engaged in development of *Data-Phone*® data sets for low- and medium-speed applications. He is supervisor of the Frequency-Shift Modem Group in the Voiceband Data Department. Member, Tau Beta Pi, Eta Kappa Nu, Sigma Xi, Alpha Phi Omega.

E. J. PASTERNAK, A.B., 1957, Harvard University; M.S.E.E., 1962, and E. E. Professional, 1966, Columbia University; Bell Telephone Laboratories, 1962—. Mr. Pasternak initially worked in Exploratory Development where he performed studies on data processing structures. Much of this work was incorporated into the hardware design of the SPC processor. He later supervised the group that developed the Recent Change and Audit programs for TSPS No. 1. He presently heads the SPC Development Department, with responsibility for both the hardware and software design of the SPC common systems processor.

J. L. POTTER, B.S., 1964, University of Iowa; M.S., 1966, Stevens Institute of Technology; Bell Telephone Laboratories, 1964—. Mr. Potter was initially involved in programming of the UNICOM ESS. After completing the program design training program, he worked on maintenance programming for the No. 1 ESS ADF. Currently he is engaged in fault recognition maintenance design of the No. 4 ESS time division switch. Member, Phi Beta Kappa, Phi Eta Sigma.

EDWARD M. PRELL, B.S.E.E., 1962, University of Kentucky; M.S.E.E., 1964, Columbia University; M.M.S., 1969, Stevens Institute of Technology; Bell Telephone Laboratories, 1959—. Mr. Prell has been concerned primarily with the design of the SPC 1A processor and the problems of providing automatic maintenance facilities for electronic switching systems. He presently supervises a group responsible for the maintenance programming for the processor and the systems test laboratory. Member, Eta Kappa Nu, Tau Beta Pi.

GEORGE RIDDELL, B.E.E., 1947, and M.E.E., 1954, City College of New York; Western Electric Company, 1942–1951; Bell Telephone Laboratories, 1951—. At Bell Labs., Mr. Riddell has been engaged in the development of Step-by-Step, Panel, No. 1 Crossbar and the TSPS No. 1 systems. At present he is Supervisor of the SPC-1A Processor and Peripheral Circuits Development Group in the TSPS No. 1 Laboratory.

WILLIAM B. ROHN, B.S.E.E., 1951, Polytechnic Institute of Brooklyn; Bell Telephone Laboratories, 1954—. Mr. Rohn performed operations analysis studies for the SAGE air defense system and missile projects. He worked on the development of a traffic simulator for the UNICOM project and the development and testing of call processing programs for the 4-wire No. 1 ESS system for the government. During the initial development of TSPS, he supervised a group that developed maintenance programs for the SPC equipments. He presently supervises a group responsible for SPC programming and planning for extended trunking arrangements.

D. A. SCHMITT, B.S.E.E., 1965, St. Louis University; M.S. (Math), 1968, Stevens Institute of Technology; Southwestern Bell, 1962–1965; Bell Telephone Laboratories, 1965–1969. At Bell Labs, Mr. Schmitt worked on the maintenance control, maintenance restart, and utility programs for TSPS No. 1. Member, Eta Kappa Nu, National Society of Professional Engineers, Pi Mu Epsilon, Alpha Sigma Nu.

M. F. SIKORSKY, B.S.E.E., 1961, Newark College of Engineering; M.E.E., 1963, New York University; Bell Telephone Laboratories, 1961—. Mr. Sikorsky was initially associated with exploratory studies of stored program common control for Step-by-Step local office equipment where he did both hardware and software design. In TSPS No. 1, he has worked in the call processing program design area and at present is Supervisor of the Planning and Requirements Group. Member, IEEE, Eta Kappa Nu, Tau Beta Pi.

M. T. SMITH, JR., B.S.E.E., 1961, Clarkson College of Technology; M.S.E.E., 1963, New York University; Bell Telephone Laboratories, 1961—. Mr. Smith has worked in the development of operational software for both the UNICOM and the No. 1 ESS ADF systems. He is currently involved in maintenance software development for the No. 4 ESS Toll system. Member, IEEE, Eta Kappa Nu, Tau Beta Pi.

R. G. SPENCER, B.S.E.E., 1966, Oregon State University; M.S.E.E., 1968, Northwestern University; Bell Telephone Laboratories, 1966—. Mr. Spencer worked on Magnetic Disk Systems for No. 1 ESS ADF. As a member of the Processor Design Department, he is now involved in the design of advanced mass storage systems.

MRS. FRANCES B. STREBENDT, B.S. (Mathematics Education), 1965, Eastern Illinois University; Bell Telephone Laboratories, 1965—. Mrs. Strebendt worked on the design and development of message retrieval and journal file retrieval software for No. 1 ESS ADF. Presently she is involved in the development of an automated process in which simulation tests and results are used in generating diagnostics for No. 4 ESS.

R. M. TAYLOR, Bell Telephone Company of Pennsylvania, 1946–1961; Bell Telephone Laboratories, 1961—. Mr. Taylor was first engaged in circuit development for the No. 12 Service Observing Desk and the Mechanized Service Observing System. Since joining the TSPS No. 1 Development, he has been responsible for the design and application of tests for system evaluation.

RAY C. TOWNLEY, M.E., 1944, and M.S.E.E., 1951, Stevens Institute of Technology; Bell Telephone Laboratories, 1946—. Mr. Townley was first engaged in studying dial speed limitations of local signaling circuits. He subsequently performed circuit and logic design for military systems and participated in flight tests of the first flyable transistorized digital computer in 1958. Later he established timing specifications and designed units of the NIKE-ZEUS and UNICOM systems. He coordinated development efforts of the DSD for No. 1 ESS ADF. At present he is working on the Automatic Intercept System No. 1A. Member, IEEE.

ERICH W. WEBER, B.S.E.E., 1958, Case Institute of Technology; M.S.E.E., 1960, University of Arizona; Bell Telephone Laboratories, 1960—. Mr. Weber has worked on the design of operational programs for two message switched systems: UNICOM and No. 1 ESS ADF. He presently supervises a group responsible for the design of No. 1A ESS administrative programs. Member, Tau Beta Pi, Eta Kappa Nu.

JOHN R. WILLIAMS, B.E. (E.E.), 1960, Vanderbilt University; M.S. (E.E.), 1961, University of Illinois; Teaching and Research Assistant, University of Illinois, 1960–1961; U. S. Navy, 1961–1964; Bell Telephone Laboratories, 1964—. Mr. Williams was involved in system design, system test hardware development, operational software design, and system verification for the No. 1 ESS ADF through 1969. Currently he is engaged in the design of autonomous scanning and signal distributing hardware for the No. 4 ESS. Member, Tau Beta Pi.

H. M. ZYDNEY, B.A., 1954, Columbia College; B.S., 1955, and M.S.E.E., 1959, Columbia University; Bell Telephone Laboratories, 1959—. At Bell Labs., Mr. Zydney has contributed to the development of data transmission equipment for TWX and DATREX services. He supervised a group which designed the operational programs for station control in the No. 1 ESS ADF. He now heads the Data Network Control Department responsible for switching planning and circuit design for digital data network services. Member, Tau Beta Pi, Eta Kappa Nu.