CONTRIBUTORS TO THIS ISSUE

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Richard F. Cook, B.S.E.E., 1953, Northeastern University; Bell Laboratories, 1953—. Mr. Cook initially worked on circuit design for a naval air-to-ground data communications system and UNICOM, a military communications system. He later worked on diagnostic programs, trouble location procedures, and microprocessor programs for No. 1 ESS Arranged with Data Features and No. 4 ESS. He is currently engaged in maintenance software designs for new teleconferencing equipment. Member, Eta Kappa Nu, Tau Beta Pi.

Edward A. Davis, B.S.E.E., Michigan State University; M.S.E.E., Northwestern University; Bell Laboratories, 1968—. Upon joining Bell Laboratories, Mr. Davis began designing an automatic billing circuit for the No. 1 ESS. He later worked on an experimental wideband network for *PICTUREPHONE*® service signals. In 1972, he worked on the design of the Input/Output circuit for the 1A Processor. Two years later, he became involved in the development of the No. 4 ESS

growth procedures. In 1976, he was promoted to assistant engineering manager on a rotational assignment with the AT&T Technical Policy Studies Group. In 1978, he returned to Bell Labs, supervising the No. 4 ESS System Growth and Project Coordination Group. In 1980, Mr. Davis became supervisor of the No. 4 ESS Field System Evaluation Group, which is responsible for analyzing the performance of the No. 4 ESS, solving field problems, and participating in the design of features aimed at improving its performance. He is currently Supervisor of the No. 4 ESS System Test and Planning Group which is responsible for introducing new system software. Member, IEEE, Tau Beta Pi, Eta Kappa Nu, Phi Eta Sigma, Tau Sigma.

Rudolph J. Frank, B.S. (Electrical Engineering), 1966, Seattle University; M.S. (Electrical Engineering), 1968, Ph.D. (Electrical Engineering), 1971, Oregon State University; Pacific Northwest Bell, 1964–1966; Bell Laboratories, 1971—. At Pacific Northwest Bell, Mr. Frank was an electronics data processing supervisor in the comptrollers division. At Bell Laboratories he worked in the Traffic Service Position System laboratory. In 1975, he was designated Bell Laboratories Visiting Professor to Southern University (Baton Rouge, La.). Mr. Frank became supervisor of the No. 4 ESS Network Management Control Group in 1976 and has worked on several large software development projects. He was recently awarded a Sloan fellowship to Stanford University.

Paul K. Giloth, B.A., 1942, Beloit College; B.S.E.E., 1947, M.S.E.E. Northwestern University; Illinois Bell Telephone Company, 1947–1950; Bell Laboratories, 1951—. Mr. Giloth worked initially on analog computer simulators for military applications. Following this, he supervised development of TRADIC, 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 arranged with data features (adf) Data Switching System. From 1970 to 1972 he was responsible for automatic voice network (AUTOVON) development. As head of the No. 4 ESS Coordination and Evaluation Department, he was responsible for developing software tools for system evaluation and the planning, engineering, and integration of early No. 4 ESS offices. Mr. Giloth is now head of the No. 4 ESS Project Management and Applications Department. He has been associated with the No. 4

ESS since 1969. He is a registered engineer in Illinois. Senior Member, IEEE; Member, Sigma Xi.

Lando Gingerich, Jr., B.S.E.E., 1959, University of Iowa; Western Electric Company, 1959–63; Bell Laboratories, 1963—. Mr. Gingerich has been associated with the development of control systems for the Nike–Zeus, *TELSTAR®*, and Safeguard projects. Since 1971, he has been involved in the physical design of the No. 4 ESS.

Kathryn M. Andersen Hoppner, B.S.E.E., 1976, University of Notre Dame; M.S.C.S., 1978, Northwestern University; Bell Laboratories, 1976–1981. As a member of the Digital Terminal Recovery Program Group, Ms. Hoppner was responsible for the development of maintenance software to support the introduction of the Digital Interface frame into the No. 4 ESS system. In addition to this responsibility, she developed portions of the microprocessor software which operates the Digital Interface frame. Member, IEEE.

Fred S. Hudson, A.A.S., 1968, DeVry Institute of Technology; Bell Laboratories, 1968—. Mr. Hudson's initial assignment was in the maintenance software area for the ADF system. In 1969, he joined the No. 4 ESS Maintenance Planning and Design Department. Since then he has been involved in the design and development of diagnostics, trouble location procedures and data bases, diagnostic control programs, routine exercise programs, craft-machine interface programs, fault recovery programs, error analysis programs, and system recovery programs. He currently is responsible for the 4E7 generic planning for the No. 4 ESS. He is also involved in defining the maintenance system architecture for the Advanced Mobile Phone Service.

Robert J. Keevers, B.S., 1950, U. S. Naval Academy; M.E.E., 1957, Rensselaer Polytechnic Institute; M.S.E.E., 1962, New York University; Bell Laboratories, 1957—. Mr. Keevers is supervisor of the Network Switching Requirements, Numbering Plan, and CCITT Support Group. His prior toll planning work has included IDDD, 800 Service, and the Traffic Service Position System. His present responsibilities with the No. 4 ESS generic 5 have focused on the Mass Announcement System. Mr. Keevers has been a long time delegate to CCITT Study Group XI and is a professional engineer in the state of New York.

H. Mann, B.A. (Mathematics), 1950, Brooklyn College; M.S. (Electrical Engineering), Columbia University; Bell Laboratories, 1954—.

Mr. Mann worked on an experimental pulse-code modulated (PCM) system and transmission of PCM over short-haul microwave systems. He designed the command decoder for Telstar. He supervised a group responsible for the design of improved single-frequency signaling systems and signaling test sets, and more recently supervised the design of the Digroup Terminal and Digital Interface Unit, the digital transmission interfaces for the No. 4 ESS. Since 1979, he has been in charge of a custom large-scale integration department. Member, IEEE, Pi Mu Epsilon.

Mohamed A. Marouf, B.Sc. (Electrical Engineering), 1970, Alexandria University, Egypt; M.S. (Electrical Engineering), 1974, Stanford University; Ph.D. (Electrical Engineering), 1977, University of Southern California; Bell Laboratories, 1977—. At the University of Southern California, Mr. Marouf did research in the design of totally self-checking digital circuitry including contributions to the design of self-checking checkers for m-out-of-n codes and Berger codes. Since joining Bell Laboratories, he has been working on the No. 4 ESS development. Member, IEEE.

Karl E. Martersteck, Jr., B.S. (Physics), 1956, University of Notre Dame; M.S. (Electrical Engineering), 1961, New York University; Bell Laboratories, 1959—. Mr. Martersteck initially worked in the Silicon Transistor and Integrated Circuit Department. In 1964 he transferred to Bellcomm Inc., where he was involved with systems engineering and analysis in support of the Apollo Lunar Landing Program and Skylab Program. Mr. Martersteck returned to Bell Laboratories in 1972, where he is currently executive director of the Network Switching Services Development Division. This position includes responsibility for stored program controlled systems that provide digital toll switching and operator services functions. Member, IEEE.

Reinhard Metz, B.S.E.E., 1972, Illinois Institute of Technology; M.S.E.E., 1973, University of Illinois; Bell Laboratories, 1972—. Mr. Metz has been involved in No. 4 ESS hardware design, including service circuits and studies of digital filter applications. Recently responsible for the Network Clock Synchronization hardware development, he is currently supervising a group designing network data features.

Richard J. Milczarek, B.S.E.E., 1973, Illinois Institute of Technology; M.S.E.E., 1977, Northwestern University; Bell Laboratories, 1977—. Mr. Milczarek has been engaged in the development of hard-

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Steve Panyko, B.E.E., 1969, City College of New York; M.S.E.E., 1971, Columbia University; Bell Laboratories, 1969—. During his first nine years at Bell Laboratories, Mr. Panyko was involved with exploratory systems in in-band signalling systems and No. 4 ESS transmission terminal equipment. He worked on hardware design and participated in the generic integration of the echo suppressor terminal. Mr. Panyko supervised a group with hardware, firmware, and diagnostic software responsibility for the Digital Interface Controller, as well as a group with systems and software design roles. Currently he is head of the Advanced Processor Design Department. Member, Tau Beta Pi, Eta Kappa Nu, Sigma Alpha.

E. L. Reible, A.M.E., 1973, North Central Technical Institute; Bell Laboratories, 1973—. Mr. Reible has been working in No. 4 ESS physical design, including the Network Clock Synchronization Unit project. He is currently participating in the physical design of Network Services Frame hardware.

Frances B. Strebendt, B.S., 1965, Eastern Illinois University; Bell Laboratories, 1965—. Ms. Strebendt has worked on operational software for the No. 1 ESS Arranged with Data Features (ADF) and for No. 4 ESS. Ms. Strebendt was responsible for the design of Announcement Handling programs for the Mass Announcement System feature in No. 4 ESS. At present Ms. Strebendt is designing administrative software for the No. 4 ESS Basic Export feature.

John E. Waninski, B.S.E.E., 1966; M.S.E.E., 1967; Ph.D., 1971, Illinois Institute of Technology; Bell Laboratories, 1971—. Mr. Waninski initially worked on performance and capacity analysis of No. 4 ESS. He was later responsible for traffic engineering and for various No. 4 ESS feature planning studies. Currently he supervises a group responsible for network operations planning for new telecommunications systems. Member, IEEE, Eta Kappa Nu, Tau Beta Pi, Sigma Xi.

David F. Winchell, B.S.M.E., 1969, Tufts University; S.M.M.E., 1970, M.I.T.; Bell Laboratories, 1969—. At Bell Laboratories, Mr. Winchell began working on the physical design of No. 4 ESS network

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John Van Zweden, B.S.E.E., 1968, University of Michigan; M.S.E.E., 1970, Purdue University; Bell Laboratories, 1969—. Mr. VanZweden has worked on the physical design of digital lines, digital multiplexers, and several No. 4 ESS transmission interfaces including the Digital Interface. He presently supervises a group responsible for the physical design of digital terminals. Member, Eta Kappa Nu, Tau Beta Pi.