

## List of Contributors

**Newell H. Brown**, B.S.E.E., 1952, University of Maryland; Bell Laboratories, 1952—. Mr. Brown has conducted sensitivity analyses of analog computer systems used in U. S. Navy radars. He assisted in the development of a millimeter radar contributing in the areas of antennas and systems. Since 1957, he has been concerned with problems of battle management, target classification, and systems engineering for ABM systems. He currently heads a department responsible for algorithm and program design for radar and missile control, performance evaluation of a multiprocessor computer system, and systems engineering for the SAFEGUARD Missile Direction Center. He holds patents on antenna systems. Member, ORSA.

**Ronald R. Conners**, B.S. (Physics), 1964, St. Louis University; M.S. (Electrical Engineering), 1965, University of California at Berkeley; Bell Laboratories, 1964–1974; American Telephone and Telegraph Co., 1974—. From 1964 to 1969, Mr. Conners was involved in the programming, integration, and testing of TSPS No. 1. From 1969 to 1974 he supervised various activities within SAFEGUARD, including development of the CENTRAN compiler, the acquisition of support computers, and monitoring the operation of these computers. He is presently a data systems supervisor at AT&T.

**Edward J. Davis**, B.S. (Physics-Mathematics) and M.B.A. (Management), 1964, Fairleigh Dickinson University. From 1958–1968, Mr. Davis was a manager, vice-president, and director of companies concerned with data-processing. Since 1969, Mr. Davis has been on the staff of Data Communications, Inc. on loan to Bell Laboratories, where he is a supervisor in the SAFEGUARD Support System Department. In this position, he has been involved in a variety of assignments in the development of large software programs. He is also presently Adjunct Professor of Management in the Graduate School of Business, Fairleigh Dickinson University.

**Bernard N. Dickman**, B.A. (Mathematics), 1963, Reed College; M.S. (Mathematics), 1966, New York University; Bell Laboratories, 1966—. Mr. Dickman initially worked on the development of a high-

level language for No. 1 ESS. He participated in the design and implementation of the tracing facilities for SNOBOL 4. While working on the SAFEGUARD project, he was responsible for the design and coordination of implementation of CENTRAN. Later he worked on the SAFEGUARD hardware logic fault simulator and on an IR&D study. During 1974, Mr. Dickman was involved in the design and development of a UNIX-based program-development environment and is presently responsible for the design and implementation of a network specification language for BISCUM.

**Bartholomew P. Donohue III**, B.S. (Mathematics), 1960, Monmouth College; M.A. (Mathematics), 1962, University of Maine; Bell Laboratories, 1962—. Mr. Donohue has worked on several ABM projects, including software development for various parts of SAFEGUARD. Currently, he is the head of the System Operations Planning Department. Member, SIAM, Phi Kappa Phi.

**Wilfred S. Doyle**, B.S. (Physics-Mathematics), 1949, Northeastern University; Western Electric Co., 1955-1963; Bell Laboratories, 1963—. Mr. Doyle has worked on the development of software for military systems since 1963. He is currently analyzing real-time multi-processor timing problems for SAFEGUARD.

**Michael P. Fabisch**, B.A., 1958, Columbia College; B.S.E.E., 1959, and M.S.E.E., 1960, Columbia School of Engineering; Bell Laboratories, 1960—. Mr. Fabisch worked on the development of the No. 1 Electronic Switching System and assisted in the installation of two early ESS offices. Currently, he is head of the Support Software Department and is involved in the development of SAFEGUARD.

**R. Don Freeman**, B.S., 1962, Michigan State University; Ph.D., 1965, Massachusetts Institute of Technology; Bell Laboratories, 1965—. Mr. Freeman initially did research on computer software, during which time he developed a technique for the automated typesetting of mathematical expressions. In 1968, Mr. Freeman transferred to the SAFEGUARD project, first working on testing software used on Meck Island. He supervised the sensor control software group from 1971 to 1973. Mr. Freeman currently supervises a group responsible for software that inventories and assigns outside plant facilities as part of the BISCUS/FACS project in the Business Information Systems program.

**Lawrence J. Gawron**, B.S.I.E., 1968, and M.S. (Computer Science), 1969, Pennsylvania State University; Bell Laboratories, 1969—. Mr. Gawron has worked on the design, development, and system analysis of SAFEGUARD's CLC multiprocessor operating system. Member, Phi Kappa Phi, Tau Beta Pi.

**Joseph R. Gibbons**, B.A. (Mathematics), 1965, King's College; M.S. (Computer Science-Mathematics), 1969, Stevens Institute of Technology; Bell Laboratories, 1966—. Mr. Gibbons has worked on a tactical environment simulation system and on missile subsystem test programs. Since 1969, Mr. Gibbons has been involved in the development and process design of a system exerciser.

**Joseph P. Haggerty**, B.E.E.E., 1967, Manhattan College; S.M. and E.E., 1969, Massachusetts Institute of Technology; Bell Laboratories, 1969—. Mr. Haggerty initially worked on the SAFEGUARD linkage editor, XPF. He later designed verification tests for the CLC operating system and analyzed the effect of proposed changes to the operating system. Member, ACM, IEEE, Eta Kappa Nu, Tau Beta Pi, Sigma Xi.

**James R. Hahn, Jr.**, B.S.E.E., 1961, University of Miami, Florida; M.S.E.E., 1963, North Carolina State; Bell Laboratories, 1961—. Mr. Hahn's initial assignments were in thin-film memory design and logic design. He then supervised the design of the Maintenance and Diagnostic Subsystem for SAFEGUARD. Next, he was responsible for producing fault dictionaries using the SAFEGUARD logic simulation facility. He presently supervises a group involved in final system planning and evaluation of the total on-line maintenance aspects of SAFEGUARD.

**Erna S. Hoover**, B.A., 1948, Wellesley College; Ph.D., 1951, Yale University; Bell Laboratories, 1954—. Mrs. Hoover has worked on the design of the No. 1 Electronic Switching System and on the design of data base management systems. Currently, she supervises a group responsible for the surveillance and track software for the Missile Direction Center.

**Harold M. Jackson II**, B.S.E.E., 1949, Duke University; M.S. (E.E.), 1955, Ohio State University; Western Electric Co., 1949-1952; Project Officer, U. S. Air Force, Wright Air Development Center, 1952-1954; Bell Laboratories, 1955—. At Western Electric, Mr. Jackson designed test equipment for airborne analog bombing and

navigation computers and participated in systems applications studies of magnetrons. His initial assignments at Bell Laboratories involved design and test activities related to transmitters and receivers for the NIKE-HERCULES radars. He designed portions of the precision tracker for TELSTAR. His assignments in the digital computer field have included design and test of special-purpose and general-purpose machines, specification of software requirements, implementation and testing of real-time operating systems and real-time missile guidance software, and establishing projectwide software change management, quality assurance, documentation standards, and management reporting systems for use on SAFEGUARD. He currently heads a department which does the design of tests involving the SAFEGUARD R&D Missile Site Radar system at Meck Island in support of the Army's ballistic missile test program. Member, IEEE, Phi Beta Kappa, Tau Beta Pi, Sigma Xi, Eta Kappa Nu, and Pi Mu Epsilon.

**Robert A. Jacoby**, B.S. (Physics-Mathematics), 1961, St. Thomas College; Univac, 1969—. As a Resident Visitor at Bell Laboratories, Mr. Jacoby was initially concerned with the design of real-time executive control programs for the NIKE-ZEUS and SPRINT missile test programs. He later worked on the design and development of an ABM system simulation, with specific interest in the user interfaces and data display. Since 1970, he has been involved in the design and development of the SAFEGUARD Data Reduction System. He is a Univac supervisor.

**John P. Kuoni**, B.A. (Mathematics), 1965, and M.S. (Statistics), 1967, Oregon State University; Western Electric, 1967—. As a Resident Visitor at Bell Laboratories, Mr. Kuoni initially worked on developing the linkage editor software for both the Meck test system and SAFEGUARD. He later completed performance improvement and cost control activities for the project computation centers. He is now assigned to the data base management technology department at Western Electric headquarters.

**W. H. Mac Williams**, B.S.E.E., 1936, Dr. Eng. (Electrical Engineering), 1941, Johns Hopkins University; Bell Laboratories, 1946—. As a Navy officer in World War II, Mr. Mac Williams was active in research and development of shipboard antiaircraft fire control equipment including radar, directors, and computers. At Bell Laboratories, he has worked in air defense and communications systems research and development, making use of both analog and digital computers,

and in operational studies of the Bell System. At present, he is head of the Data Processing System Control Department. His current responsibilities include studies to improve software quality and fundamental studies of software reliability.

**John F. McDonald**, B.S.E.E., 1961, Kansas University; M.S.E.E., 1963, New York University; Bell Laboratories, 1961—. Mr. McDonald was involved in various phases of ABM system work from 1961 to 1973. He participated in generating the initial system requirements for the Meck test program and was involved in process design activities for the Meck software. He participated in the initial process design of the Perimeter Acquisition Radar software. Later he supervised the system design and system testing of the PAR system exerciser. Currently, he supervises a group involved in the systems engineering of new Business Information Systems applications and enhancements to existing BIS products.

**Donald W. Meseke**, B.S.E.E., 1958, Kansas State University; M.E.E., 1960, New York University; Bell Laboratories, 1958—. Mr. Meseke initially worked on display subsystems for the NIKE-ZEUS ABM system and later participated in test planning and data analysis for the Kwajalein test program for NIKE-ZEUS. Since 1967, he has worked on system design for SAFEGUARD and its predecessor, SENTINEL; he took part in writing the SAFEGUARD Data Processing System Performance Requirements. He is presently evaluating SAFEGUARD software design.

**John D. Musa**, B.A., 1954, and M.S., 1955, Dartmouth College; Bell Laboratories, 1958—. Mr. Musa's assignments in the area of ballistic missile defense have included systems engineering, computer program design, human factors engineering, and supervision of computer simulation facilities. He was responsible for the creation and operation of a computerized project-management reporting system for SAFEGUARD and has actively been involved in the investigation of new program development techniques. He currently supervises a group that is designing display-and-control simulation programs for use in human factors testing. Member, IEEE.

**Barbara C. Nichols**, B.A. (Chemistry), 1966, Duke University; IBM Corporation, 1966—. As a Resident Visitor, Ms. Nichols was the manager of an IBM group developing verification tests for the CLC

operating system. In 1970, with the assistance of Dr. Harlan Mills, this group became a pilot project for the phased introduction of structured programming techniques. Ms. Nichols is currently a member of the technical staff of the IBM Federal Systems Center where she is studying new techniques of software development.

**John W. Olson**, B.S.E.E., 1957, Michigan Technological University; M.E.E., 1959, New York University; Bell Laboratories, 1957—. Mr. Olson worked on the design of special-purpose digital processors for the NIKE-ZEUS project. He later supervised groups responsible for developing multiprocessor computers for NIKE-X and SAFEGUARD. Currently, he supervises a group responsible for telephone loop carrier systems. Member, IEEE, Eta Kappa Nu, Phi Kappa Phi.

**John E. Petersen**, B.S. (Marine Engineering), U. S. Merchant Marine Academy; Western Electric, 1941-1959; Bell Laboratories, 1959—. Since joining Bell Laboratories, Mr. Petersen has been primarily engaged in R&D contracting for the major subsystems of the SAFEGUARD project. He is currently head of the Whippany contracting department.

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**Charles J. Rifenberg**, B.S. (Mathematics), 1963, St. Peter's College; M.S. (Computer Science), 1969, Stevens Institute of Technology; Bell Laboratories, 1963—. Mr. Rifenberg has worked on the design and development of basic support software. Since 1971 he has supervised several groups within SAFEGUARD, being responsible for support-software testing, computer-center support, developing the SAFEGUARD digital logic simulator, and developing a simulator for offensive attacks. Currently, he is supervisor of the COSMOS order-processing design group.

**Francis E. Slojkowski**, B.S.E.E., 1959, St. Louis University; M.E.E., 1961, New York University; Bell Laboratories, 1959—. Mr. Slojkowski has worked on a variety of military hardware and software development projects, including circuit analysis and design for the NIKE-HERCULES system, analysis and program design for NIKE-ZEUS, and management of prototype data-processing installations for NIKE-X and SAFEGUARD. He currently supervises a group responsible for the design of SAFEGUARD maintenance software.

**Daniel Van Haften**, B.S. and M.S. (Mathematics), 1970, Michigan State University; Bell Laboratories, 1970—. Mr. Van Haften has worked on the development and implementation of software change control for SAFEGUARD. Currently, he is engaged in development work on the Status Accounting System, an information storage and retrieval system for tracking problems in SAFEGUARD software. Member, Phi Beta Kappa, Phi Kappa Phi, Pi Mu Epsilon.

**Patricia A. Van Sciver**, B.A. (Mathematics), College of William and Mary; IBM, 1969—. Before joining IBM, Mrs. Van Sciver taught mathematics at the secondary and college levels. As a Resident Visitor at Bell Laboratories from 1969 to 1974, she worked on SAFEGUARD support software development test and verification.

**F. Nelson Woome, Jr.**, Electronic Technology, 1952, RCA Institutes; Bell Laboratories, 1952—. Mr. Woome has been involved in the development of the M33, NIKE-AJAX, and NIKE-HERCULES fire control systems and the Missile Site Data Processing Systems at Meck Island, Kwajelein Atoll, and the Marshall Islands. On SAFEGUARD he worked on the development and operation of the Management Reporting System and on methods to predict scheduling problems during program integration. Currently, he is working in the Missile Direction Center system integration group.

