

Contributors

William P. Allis was born in Menton, France, on November 15, 1901. He was educated at the Massachusetts Institute of Technology, Cambridge, Mass., receiving the B.S. degree in 1923, the M.S. degree in 1924, from this institution, and the D.Sc. degree in 1925 from the University of Nancy, France. He was a Lieutenant Colonel in the U. S. Army from 1942 to 1945 and received the Legion of Merit Award in 1945.

He was, successively, a research associate in physics, instructor, assistant professor, associate professor, and professor at M.I.T. He has been chairman of the Gaseous Electronics Conference since 1949 and a consultant to the Los Alamos Scientific Laboratory since 1952. His special field of work is in plasma physics.

Dr. Allis is a Fellow of the American Physical Society, the Association of Physics Teachers, the American Academy of Sciences and The Physical Society, London, and a member of Sigma Xi.



W. P. ALLIS

in 1948, and the M.S. degree in business management from Stevens Institute of Technology, Hoboken, N. J., in 1953. He is presently completing the requirements for the doctorate degree in electrical engineering at the Polytechnic Institute of Brooklyn, Brooklyn, N. Y.

During World War II, he served in the Army Signal Corps as communications chief of Radio Receiver Station

WXH, Ketchikan, Alaska. He joined the Radio Corporation of America, Lancaster, Pa., in 1948, where he was project engineer on various development programs in microwave magnetrons, traveling-wave tubes, and plasma-filled cavities. From 1953 to 1956, he was employed at the Tube Division of the Radio Corporation of America, Harrison, N. J., where he was in charge of the microwave-tube application engineering group. In 1956, he joined the staff of Airborne Instruments Laboratory, Melville, N. Y., where he is presently associated with the Department of Applied Electronics as Consultant, and is concerned with theoretical and experimental work on microwave solid-state devices, such as new types of solid-state maser amplifiers, microwave ferrite devices, and parametric amplifiers. He is presently directing programs in the microwave ferrite, and microwave and optical maser fields.

Mr. Arams is a member of Tau Beta Pi, Eta Kappa Nu, the American Physical Society, and the Editorial Boards of the IRE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES and the *Microwave Journal*.



F. R. ARAMS

worked in the field of magnetic materials, particularly ferrites.

Mr. Bady is a member of Phi Beta Kappa.



Brian J. Elliott was born on August 29, 1929, in Auckland, New Zealand. He received the B.Sc. and M.Sc. degrees in 1953

and 1956, respectively, from the University of New Zealand. From February, 1956, to February, 1957, he was on the teaching staff of the Auckland University College. Since April, 1957, he has been employed as a research associate at the Microwave Laboratory, W. W. Hansen Laboratories of Physics, Stanford University, Stanford, Calif.

Research for the M.Sc. degree involved precision current and voltage regulation problems. His work at the Hansen Laboratories has been concerned with high powered modulator design, millimicrosecond pulse technology, and most recently, ferrites at microwave frequencies.



Sverre T. Eng (M'58), was born in Harstad, Norway, on July 30, 1928. He received the Master's degree in electrical engineering from Chalmers University of Technology, Gothenburg, Sweden, in 1953.

From 1953 to 1956, he was a research associate at the Laboratory of Electronics of Chalmers University, where he worked in the field of microwave systems and radio astronomy. From 1956

to 1957 he worked with the Semiconductor Division of Hughes Aircraft Co., Los Angeles, Calif., on high-frequency transistor characterization and circuits. During the years 1957 to 1958 he did some special studies in electronics at Stanford University, Palo Alto, Calif., and worked as a research assistant on advanced transistor circuitry.

He rejoined Hughes Semiconductor Division, this time at Newport Beach, Calif., in 1958. Since then he has been working on research and development of parametric amplifier diodes, mixer diodes, and microwave characterization and application of semiconductor devices. In 1958 Mr. Eng became a section head; he is presently in charge of microwave semiconductor electronics.

Mr. Eng is a member of the Scientific Research Society of America.



W. W. ANDERSON

While at M.I.T. he worked alternate semesters in the co-operative program at the Naval Ordnance Laboratory, Silver Spring, Md. Since 1959, he has been associated with the Bell Telephone Laboratories, Murray Hill, N. J., where he has worked on various problems in the Solid-State Electronics Research Department. He is now with the department of electrical engineering, Stanford University, Stanford, Calif.

Dr. Anderson is a member of Sigma Xi.



Frank R. Arams (S'44-A'49-SM'55) was born on October 18, 1925 in the Free City of Danzig. He received the B.S.E. degree in electrical engineering and mathematics from the University of Michigan, Ann Arbor, in 1947, the M.S. degree in applied physics from Harvard University, Cambridge, Mass.,

in 1948, and the M.S. degree in business management from Stevens Institute of Technology, Hoboken, N. J., in 1953. He is presently completing the requirements for the doctorate degree in electrical engineering at the Polytechnic Institute of Brooklyn, Brooklyn, N. Y.

He has been employed by the United States Army Signal Research and Development Laboratory, Fort Monmouth, N. J., since 1941. Initially, he worked on instrumentation for the evaluation of components and materials. The frequency range covered was from dc through microwaves. Instrumentation under pulse conditions was also included. For the past four years he has



B. J. ELLIOTT



S. T. ENG

M. E. Hines (S'46-A'47-M'50) was born on November 30, 1918, in Bellingham, Wash. He attended the California Institute of Technology, Pasadena, where he received the B.S. degree in applied physics in 1940 and, as a member of the Air Force Weather Service, the B.S. degree in meteorology in 1941. After World War II, he returned to the California Institute of Technology, where he received the M.S. degree in electrical engineering in 1946.

He has been employed since 1946 at the Bell Telephone Laboratories at Murray Hill, N. J., where he has been engaged in the development of traveling-wave tubes, microwave triodes and storage tubes. He has also been concerned with the development of pulse-code modulation transmission systems. Most recently, he has been in charge of a group interested in solid-state microwave devices. Mr. Hines is now associated with Microwave Associates, Inc., Burlington, Mass.



T. M. HYLTIN

Tom M. Hyltin (S'51-A'54-M'60) was born in Temple, Tex., on October 22, 1930. He received the B.S. degree in electrical engineering from the University of Texas, Austin, in 1957.

From 1953 to 1956, he was employed by Kiva Exploration Corporation in Austin where he was engaged in the design and development of electronic geophysical prospecting equipment. In 1956, he joined the staff of the Electrical Engineering Research Laboratory at the University of Texas, where he worked on instrumentation for millimeter wave propagation studies.

He was with Temco Aircraft Corporation for one year, working on various projects in missile guidance. In 1958, he joined Texas Instruments, Apparatus Division, where he is now engaged in solid-state microwave device development in the Research and Development Department.

❖

Frank Keywell was born on March 16, 1923, in Detroit, Mich. He received the B.A. degree in physics-meteorology from the University of California at Los Angeles in 1944. During World War II, he served with the United States Air Force in the fields of weather forecasting and aircraft operations. He received the M.S. degree in 1951 and the Ph.D. degree in 1954 in physics from the University of Southern California. His thesis work, done under an ONR contract, was related to high-vacuum's sputtering of metals due to ion bombardment and a statement of the phenomenon in terms of radia-

tion damage in metals.

After graduation, he joined the Bell Telephone Laboratories, Murray Hill, N. J. where he did work in the field of silicon junction transistor development by means of gaseous diffusion techniques. He worked on development of diffused silicon mesa parametric diodes for two years in the employ of Hughes Aircraft Company. Since 1960, he has been Director of Research and Development for Semiconductor Devices Incorporated, Newport Beach, Calif., his main interest being in the field of parametric diodes and applications of semiconductor materials to the microwave region.

Dr. Keywell is a member of the American Physical Society and Sigma Xi.

Kenneth L. Kotzebue was born in San Antonio, Tex., on December 4, 1933. He received the B.S. degree in mechanical engineering from the University of Texas, Austin, in 1954, the M.S. degree in engineering from the University of California at Los Angeles in 1956, and the Ph.D. degree in electrical engineering in 1959 from Stanford University, Stanford, Calif.

During 1954-1956 he was a member of the technical staff of Hughes Aircraft Company, Los Angeles, Calif., while a participant in the Master's Cooperative Program. He was research assistant at Stanford University for two years, working in the field of solid-state parametric amplifiers. In 1958 he became a senior engineer with the Apparatus Division of Texas Instruments, Inc., Dallas, where he worked in the field of semiconductor diode parametric amplifiers and harmonic generators. Since 1959 he has been a member of the technical staff of Watkins-Johnson Company, Palo Alto, Calif., engaged in research and development of solid-state microwave devices.

Dr. Kotzebue is a member of Tau Beta Pi and Sigma Xi.

Dr. Benjamin Lax was born in Hungary on December 29, 1915. He received the B.M.E. degree from Cooper Union, New York, N. Y., in 1941 and the Ph.D. degree in physics from the Massachusetts Institute of Technology, Cambridge, in 1949.

While serving in the army from 1942 to

1946, he attended radar school at Harvard University, Cambridge, Mass., and M.I.T. He was a radar officer assigned to M.I.T.

Radiation Laboratory from 1944 to 1946. In 1946 he became a consultant for Sylvania Electric Company. From 1949 to 1951 he carried on research in microwave gas discharge for the Geophysical Directorate of Cambridge Research Center. In November, 1951 he joined the Solid-State Group at Lincoln Laboratory, M.I.T., and in 1953 he became head of the ferrites group. In 1955 he became head of the Solid State Group. In 1957 he became associate head of the Communications Division at Lincoln Laboratory, in charge of solid-state physics in several laboratory groups, and was appointed head of the Solid-State Division when it was established in 1958. He was also appointed director of the new M.I.T. Magnet Laboratory in July, 1960.

Dr. Lax was recipient of the 1960 Oliver E. Buckley prize of the American Physical Society for his fundamental contributions to microwave and infrared spectroscopy of semiconductors. He is a Fellow of the American Physical Society and a member of the Executive Committee of the Solid-State Division, the Solid-State Advisory Panel of the Office of Naval Research. He was associate editor of the *Journal of Applied Physics* from 1957-1959, and is now associate editor of the *Physical Review* and the *Microwave Journal*. He is a member of Sigma Xi.

James A. Luksch (M'58) was born in Buffalo, N. Y. on July 12, 1930. He received the B.S. degree in electrical engineering from the University of Buffalo, Buffalo, N. Y., in 1957 and the M.S. degree in electrical engineering from the University of Pennsylvania in 1960.

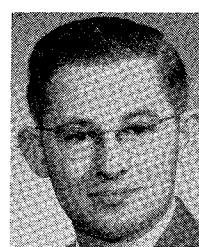
In 1957 he joined RCA as a microwave engineer with the Missile and Surface Radar Department, where he has worked on the design of microwave components and low-noise devices. He is presently concerned with the development of solid-state microwave components.

Mr. Luksch is a member of Tau Kappa Chi.

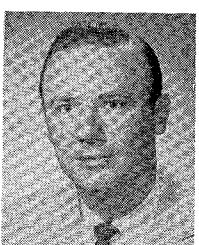
George L. Matthaei (S'49-A'52-M'57), for a photograph and biography, please see page 675 of the November, 1960, issue of these TRANSACTIONS.



F. KEYWELL



B. LAX



J. A. LUKSCH

Edgar W. Matthews, Jr. (S'46-A'47-M'54-SM'60), was born in Johnstown, Pa., on May 19, 1925. He received the B.E.E. and M.E.E. degrees from Rensselaer Polytechnic Institute in 1946 and 1950, respectively, and the Ph.D. degree from Harvard University in 1954.

From 1946 to 1947 he worked as a junior engineer at the Westinghouse Research Laboratories, and from 1947 to 1949 he was an instructor at R.P.I. While at Harvard (1949-1953) he held first a Teaching Fellow appointment and later an AEC Predoctoral Fellowship. From 1953 to 1955 he was employed in the microwave research section of Sperry Gyroscope Company. He returned to R.P.I. in 1955 for combined teaching and research, as an assistant professor and later as an associate professor of electrical engineering. He joined the RCA Missile and Surface Radar Division, Moorestown, N. J., in 1958, where he has been engaged in the development and application of low-noise parametric and tunnel diode amplifiers for use in monopulse radars. In 1960 he was appointed a group leader in the Microwave Antenna Unit. He has also been associated with the RCA-Villanova Graduate Program.

Dr. Matthews is a member of Tau Beta Pi, Eta Kappa Nu, Sigma Xi, and the American Society for Engineering Education.



E. W. MATTHEWS

Technology, Gothenburg, Sweden, in 1952.

Since 1951 he has been employed at the Norwegian Defense Research Establishment, Bergen, Norway, doing research on microwave communication and microwave network theory. From 1958 to 1960 he spent 18 months at the Microwave Laboratory of Stanford University, working mainly on microwave properties and applications of ferrites.

Mr. Schaug-Pettersen is a member of Sigma Xi and the Tensor Club of Great Britain.

❖

W. M. Sharpless (A'28-M'38-SM'43-F'58) was born in Minneapolis, Minn., on September 4, 1904. He received the B.S. degree in electrical engineering in 1928 and the E.E. degree, both from the University of Minnesota, Minneapolis.

He is a member of the Radio Research Department of the Bell Telephone Labs., Holmdel, N. J., where for the past years he has been associated with many important research projects. His most recent work has been on studies having to do with the investigation of the resistive and reactive properties of high frequency point contact diodes.

Mr. Sharpless is a member of the Scientific Research Society of America and the American Physical Society.

❖

Herbert J. Shaw (M'55) was born in Seattle, Wash., on June 2, 1918. He received the B.S. degree from the University of Washington, Seattle, in 1941, and the M.A. and Ph.D. degrees in 1942 and 1948, respectively, from Stanford University, Stanford, Calif.

In 1941 he was a test engineer at General Electric Co. in Schenectady, N. Y. Since then he has been at Stanford University, where he

is presently a senior research associate in the Microwave Laboratory and a research associate in the physics department. He was acting director of the Microwave Laboratory during the summer of 1960. He is engaged in research in microwave tubes and microwave physics.

Dr. Shaw is a member of Tau Beta Pi and Sigma Xi.



H. J. SHAW

He was a member of the faculty of the University of Pennsylvania, Philadelphia, from 1950 to 1952, of the University of Illinois, Urbana, from 1952 to 1955, and of Princeton from 1955 to 1958. He was a National Science Foundation Senior Post-Doctoral Fellow and an exchange professor at the University of Paris during 1957-1958, and a visiting member of the Institute for Advanced Study during 1958-1959. Dr. Pines is presently professor of physics and electrical engineering at the University of Illinois, and is also affiliated with the John Jay Hopkins Laboratory for Pure and Applied Science, General Atomic Division of General Dynamics Corporation, San Diego, Calif.

❖

Tor Schaug-Pettersen was born in Narvik, Norway on June 4, 1928. He received the E.E. degree from Chalmers Institute of

Technology, Gothenburg, Sweden, in 1952.

Since 1951 he has been employed at the Norwegian Defense Research Establishment, Bergen, Norway, doing research on microwave communication and microwave network theory. From 1958 to 1960 he spent 18 months at the Microwave Laboratory of Stanford University, working mainly on microwave properties and applications of ferrites.

Mr. Schaug-Pettersen is a member of Sigma Xi and the Tensor Club of Great Britain.

❖

W. M. Sharpless (A'28-M'38-SM'43-F'58) was born in Minneapolis, Minn., on September 4, 1904. He received the B.S. degree in electrical engineering in 1928 and the E.E. degree, both from the University of Minnesota, Minneapolis.

He is a member of the Radio Research Department of the Bell Telephone Labs., Holmdel, N. J., where for the past years he has been associated with many important research projects. His most recent work has been on studies having to do with the investigation of the resistive and reactive properties of high frequency point contact diodes.

Mr. Sharpless is a member of the Scientific Research Society of America and the American Physical Society.

❖

Herbert J. Shaw (M'55) was born in Seattle, Wash., on June 2, 1918. He received the B.S. degree from the University of Washington, Seattle, in 1941, and the M.A. and Ph.D. degrees in 1942 and 1948, respectively, from Stanford University, Stanford, Calif.

In 1941 he was a test engineer at General Electric Co. in Schenectady, N. Y. Since then he has been at Stanford University, where he

is presently a senior research associate in the Microwave Laboratory and a research associate in the physics department. He was acting director of the Microwave Laboratory during the summer of 1960. He is engaged in research in microwave tubes and microwave physics.

Dr. Shaw is a member of Tau Beta Pi and Sigma Xi.

Isamu Tatsuguchi was born in Hauula, Oahu, Hawaii on November 22, 1926. He received the B.S. degree in electrical engineering in 1951 from Milwaukee School of Engineering, Milwaukee, Wis. He served as a teaching assistant and later as a research assistant while at the University of Wisconsin, Madison, where he received the M.S. and Ph.D. degrees in electrical engineering in 1953 and 1955, respectively.

He joined the Bell Telephone Laboratories in Whippany, N. J., in 1955. As a member of the technical staff there, he has been engaged in research, development and measurement work involving low noise microwave components and circuits.

Mr. Tatsuguchi is a member of Sigma Xi.

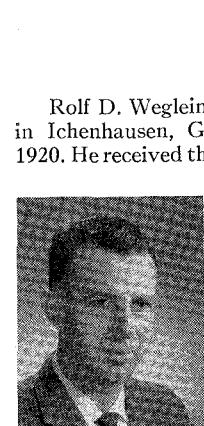
❖

George A. VerWys (M'57) was born in Kalamazoo, Mich., on March 28, 1933. He received the B.S. degree in electrical engineering from the University of Michigan, Ann Arbor, in 1956.

In 1956 he joined RCA as a design engineer in the Missile and Surface Radar Division at Moorestown, N. J., where he has worked with radar components and, in particular, with low-noise receivers.



G. A. VERWYS



R. D. WEGLEIN

Rolf D. Weglein (A'52-SM'58) was born in Ichenhausen, Germany, on August 13, 1920. He received the B.S.E.E. and M.S.E.E. degrees from the California Institute of Technology, Pasadena, in 1953 and 1954, respectively.

In the years since his graduation, he has been a member of the technical staff of the Research Laboratory of the Hughes Aircraft Company, now at Malibu, Calif. Early work in research and development of backward-wave oscillators has recently resulted in his interests in solid-state devices. He now heads a group concerned with solid-state parametric amplifiers.

Mr. Weglein is a member of Tau Beta Pi, RESA, Sigma Xi, and the American Physical Society.