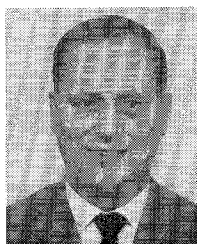


# Contributors



**Joseph H. Battocletti** (S'48-A'50-M'55-SM '58) was born in Bridgeport, Ohio, on March 12, 1925. He received the B.E.E. degree from the University of Detroit, Mich., in 1947, the M.S.E.E. degree from Northwestern

University, Evanston, Ill., in 1949, and the Ph.D. degree in engineering from the University of California, Los Angeles, in 1961.

From 1949 to 1951 he was a radio engineer at Motorola, Inc., Chicago, Ill. From 1951 to 1962 he was a Professor at Loyola University of Los Angeles, Calif., where he was Chairman of the Electrical Engineering Department for the academic year, 1961-1962. During the summers from 1955 to 1961, he was a member of the technical staff of various companies, namely, Douglas Aircraft Co., Hughes Aircraft Co. (Semiconductor Division), and Servomechanisms, Inc., all in El Segundo, Calif. He is currently an electronics consultant to the Chilean Universities for the U. S. National Academy of Sciences and the U. S. Agency for International Development, and is on leave of absence from Marquette University, Milwaukee, Wis.

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



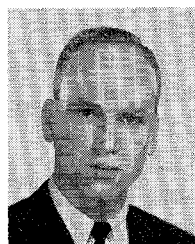
**Robert W. Beatty** (S'43-A'45-M'50-SM '53) was born in York, Pa., on May 31, 1917. He received the B. S. degree in electrical engineering from George Washington University, Washington, D. C., in 1939, and the S.M.

degree in electrical communication from the Massachusetts Institute of Technology, Cambridge, in 1943.

From 1940 to 1942 he was associated with the Naval Research Laboratory, Washington, D. C., in work on underwater sound and radio direction finding. He was a Staff Aid at the M.I.T. Radar School in 1943 and served in the U. S. Naval Reserve from 1943 to 1946. He has had several years experience in the field of consulting radio engineering for the radio broadcast industry. Since 1948 he has been associated with the National Bureau of Standards working in the field of

microwave standards, and was Chief of the Microwave Circuit Standards Section at NBS, Boulder, Colo., from 1955 to 1962. He is at present a Consultant in the Radio Standards Laboratories Engineering Division.

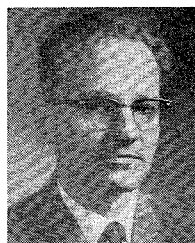
Mr. Beatty is a member of Sigma Tau, Theta Tau, Sigma Xi, RESA, and Past Chairman of U.S.A. Commission I of the International Scientific Radio Union.



**Edward G. Cristal** (S'58-M'61) was born in St. Louis, Mo., on January 27, 1935. He received the B.S. and A.B. degrees in 1957 in electrical engineering and mathematics, respectively, and the M.S. degree in 1958 in electrical

engineering, all from Washington University, St. Louis. He received the Ph.D. degree in January, 1961, in electrical engineering from the University of Wisconsin.

In March, 1961, he joined the staff of the Electromagnetic Techniques Laboratory at Stanford Research Institute, Menlo Park, Calif. Since that time he has been engaged in research in microwave filters, amplifiers and multiplexers.



**Samuel P. Morgan** (SM'55-F'62) was born in San Diego, Calif., on July 14, 1923. He received the B.S. and M.S. degrees, and the Ph.D. degree in physics all from the California Institute of Technology, Pasadena, in

1943, 1944, and 1947, respectively.

Since 1947 he has been a Research Mathematician with Bell Telephone Laboratories, Murray Hill, N. J. He has been particularly concerned with applications of electromagnetic theory to microwave antennas and to problems of waveguide and coaxial cable transmission. As Head, Mathematical Physics Department, he now supervises a research group in various fields of mathematical physics.

Dr. Morgan is a member of the American Physical Society, the American Association for the Advancement of Science, Tau Beta Pi, and Sigma Xi.



**Hillel Unz** (S'53-M'57-SM'60) was born in Darmstadt, Germany, on August 15, 1929. He received the B.S. degree summa cum laude in electronics in 1953 and the Diplome Engineer degree (in absentia) in 1961 from

the Israel Institute of Technology (Technion), Haifa, Israel. He received the M.S. and Ph.D. degrees in 1954 and 1957, respectively, from the University of California at Berkeley.

He went to Israel in 1931 and served there in the Israel Defense Forces during the war for independence from 1948 to 1949. From 1953 until 1957 he was a Research Assistant in the Microwave Antenna Laboratory of the Electrical Engineering Department, University of California at Berkeley. Since February, 1957, he has been on the staff of the Electrical Engineering Department, University of Kansas, Lawrence, beginning as an Assistant Professor and in 1962 becoming a full Professor. He was a Consultant for the Radiation and Infrared Laboratories of the University of Michigan, Ann Arbor, during the summer of 1958, a Research Associate in the Ionosphere Research Laboratory, Pennsylvania State University, University Park, during a part of the summer of 1959, and a Research Associate in the Antenna Laboratory, Ohio State University, Columbus, during the summers of 1961 and 1962. He was a part-time Consultant for the Midwest Research Institute, Kansas City, Mo., from 1958 to 1960 and a part-time Consultant for Texas Instruments, Inc., Dallas, Tex., from 1960 to 1962. Since October, 1962, he has been a part-time Consultant for the Antenna Laboratory of Ohio State University.

He has done research work in electromagnetic theory, boundary value problems, microwave networks, antenna arrays and electronic scanning, scattering and diffraction, propagation in the ionosphere, bounded gyrotropic media (plasma and ferrites) and inhomogeneous media, parametric nonlinear interaction with electromagnetic waves and others, and he has published numerous papers. In 1955 he first suggested the use of nonuniformly spaced antenna arrays and developed the basic theory.

Dr. Unz is a member of Sigma Xi.



**Leo Young** (M'54-SM'57), for a photograph and biography, please see page 619 of the November, 1962, issue of these TRANSACTIONS.