



Clarence Lester Hogan

Clarence Lester Hogan was born on February 8, 1920, in Great Falls, Mont. He received the B.S. degree in chemical engineering from Montana State College in 1942. While an undergraduate he was elected to Phi Kappa Phi and Tau Beta Pi and received two awards: the American Chemical Society Award, based on an election by the faculty and student body, and given to a junior student showing great promise for professional development, and the Montana Society of Engineers Gold Medal, given to the most outstanding senior in the College of Engineering. Among his extra curricular activities were the offices of editor-in-chief of the college publication, *The Montana Engineer*, and vice-president of Kappa Sigma.

Following his graduation from Montana State College he was employed for one year as a research engineer at Anaconda Copper Mining Company, Great Falls, Mont. He then served as an officer in the United States Navy for three years during which time he was officer-in-charge of the acoustic torpedo shop at Pearl Harbor for two years.

Dr. Hogan pursued his graduate studies at Lehigh University and was awarded the degrees of M.S. and Ph.D. in physics in 1947 and 1950, respectively. His major fields of study were solid-state and electromagnetic theory, and his doctoral dissertation was titled "The Thermal Conductivity of Metals at High Temperature." He became affiliated with Sigma Xi in 1948. Dr. Hogan held a full-time instructorship in the Physics Department at Lehigh University teaching several courses in physics and electronics.

In 1950, Dr. Hogan became a member of the technical staff at Bell Telephone Laboratories, Murray Hill, N. J. Thereafter, he became intrigued with the feasibility of a nonreciprocal element at microwave frequencies. His logic soon led to the combination of electrons immersed in a magnetic field and the problem very rapidly centered on that of a suitable material. Utilizing his knowledge in physics and chemistry, his attention focused on iron oxides in crystalline structures and this resulted in the investigation and development of new ferrite materials.

Dr. Hogan performed experiments which demonstrated

nonreciprocity at microwave frequencies and carried out a theoretical analysis substantiating the experiments. This early work, now a classical reference, was published in January, 1952 in the *Bell System Technical Journal* under the title, "The Ferromagnetic Faraday Effect at Microwave Frequencies and Its Applications."

In 1953, Dr. Hogan accepted the position of Associate Professor of Applied Physics at Harvard University, Cambridge, Mass., where he has been actively extending the knowledge of ferrites. By realizing that the basic limitations in the application of ferrites will be due to the material itself, Dr. Hogan and his graduate students at Harvard University studied new single crystals and rare-earth-element ferrites. The investigations contributed to the development of phenomenally low-loss ferrite garnets which greatly lower the operational frequencies of ferrite devices. The extent of the significance of Dr. Hogan's early experiments on nonreciprocity cannot yet be predicted.

Dr. Hogan organized and led the widely acclaimed Symposium on Microwave Properties and Applications of Ferrites which was held at Harvard University on April 2-4, 1956. He later edited the October, 1956 issue of the *PROCEEDINGS OF THE IRE* which was a special issue featuring the papers presented at this Symposium.

He has published nine articles, presented twenty-five invited seminars and papers, holds two patents, and has consulted for six industrial laboratories. He is a member of the American Physical Society, Technical Panel on Magnetic Materials (Materials Advisory Board for the Department of Defense), Subcommittee on Magnetic Materials (AIEE), Second Vice-President of Harvard Engineering Society, Conference on Electrical Engineering Education (sponsored by National Science Foundation), and the Advisory Council of the Department of Electrical Engineering of Princeton University. He is also a Senior Member of the Institute of Radio Engineers and a member of the Executive Committee of the Boston IRE Section.

In 1957 Dr. Hogan was promoted to Gordon McKay Professor of Applied Physics at Harvard University.