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**A Biographical Sketch of
MELVILLE EASTHAM**

The first Eastham to settle in Oregon was the pioneer, William French Eastham, who had come from Culpepper County, Virginia to Illinois where he married Anne Cleaver, recently from Kentucky, In search of homestead land, they came to Oregon in 1848 and settled in the Willamette valley near what in now Silverton.

The eldest of nine children was Edward Lawson Eastham who became identified with the water-power and public-utility development in Oregon City. He married Clara Caufield, also of Oregon City, and lived there during the remainder of his lifetime.

Their second son of a family of five was Melville Eastham, who was born in Oregon City in 1885. Educated in the public schools of Oregon City, he became interested in electrical engineering and left school in the early 1900's to work for a public utility in San Francisco.

In 1905 he left San Francisco to become Chief Engineer of Willysing (?) and Gibson, manufacturers of precision instruments, in New York City. A year later, in Cambridge Massachusetts, with J. K. Clapp he founded the Clapp-Eastham Company for the purpose of manufacturing X-ray equipment.

As the infant "wireless" industry grew, The Clapp-Eastham Company gradually shifted its business to the production of transmitting and receiving equipment. It soon became evident to Mr. Eastham that this growing industry would eventually need equipment for the quantitative measurement of the system performance when its development emerged from the empirical stage and became an exact science. As his principal interest was in the manufacture of precision electrical instruments, he founded the General Radio Company in 1915 and became its first president, an office which he held until 1944.

The course of this new company he set firmly along the road of instrument manufacture. Whenever other important considerations forced a change in the nature of the company's product, as in World War I, when special war devices were made, and in the home-receiver-building boom of the early twenties when radio parts were made, instrument design and planning were still carried on and their manufacture resumed on a major scale when conditions permitted. The essential correctness of this belief in the future of instrumentation began to be evident in the late twenties when not only radio and other branches of electrical communication, but industry as well, became research conscious and adopted the view that industry's future lay in the products of the research laboratory. Much of the speed with which new developments in science and industry came to fruition in the nineteen thirties and ultimately in World War II can be traced to the availability of these tools of measurement without which research cannot function.

Mr. Eastham's aim was not to produce the specialized one-of-a-kind product, but to make available on a commercial scale the type of instrument that formerly had to be designed and built by the user himself. Starting with simple laboratory standards of resistance, capacitance and inductance in 1915, a steadily increasing number of complex electronic instruments have been made available to industry. Developed either by Mr. Eastham, or by a staff of engineers under his direction, have been such widely used electronic instruments as the impedance bridge, the beat-frequency oscillator, the standard signal generator, the harmonic frequency standard, and the heterodyne wave analyzer. All of these are essential to the continued operation and development of present-day electrical communication. The same principles of design and manufacture have more recently been applied to industrial instruments, resulting in equipment for the measurement and analysis of vibration and rotational speed, and for the analysis of mechanical systems.

Mr. Eastham's interests have been as important in the field of manufacturing methods as in development. His jig methods of assembling and soldering variable air capacitors, covered by two of his early patents, are still in use today in the radio industry without substantial change.

He recognized at an early date that men were fully as important as methods, and that well-paid, intelligent factory employees, who considered their Company a pleasant as well as a profitable place to work, were one of the best guarantees of continued product quality and successful Company operation. In the General Radio Company, under his direction, many practices only now becoming commonplace were initiated at an early date.

Group life insurance, for all employees, wholly paid for by the Company, was started in 1918. The five-day week was instituted in 1919, as was the profit-sharing bonus. Vacations with pay for all employees have been granted ever since the Company was founded.

As soon as General Radio Company began to grow, Mr. Eastham set as one of his aims the employment of the minimum number of people necessary to produce instruments in sufficient quantity to satisfy the existing markets in order to be able to preserve continuity of employment for employees. Throughout the history of the Company it has not been necessary to lay off a single employee because of lack of work, overproduction or any of the economic ills. Recognizing the importance of careful and complete engineering investigation to insure the continuous flow of new products and developments ahead of the field, his Company always has maintained a large and active staff of research and development engineers. The ratio of engineering personnel to total employees is considerably higher than in any other company manufacturing electrical measuring equipment.

Appreciating the advantages, both to the individual and to the Company, of a good educational background, all of the engineers hold degrees from engineering schools, many having advanced degrees. The pressure of his many duties precluded the possibility of frequent contributions to the technical literature by Mr. Eastham; nevertheless he encourages technical writing on the part of engineers associated with the General Radio Company, and considered this an important phase of their work. Both personally and through the Company he has frequently contributed to educational and research projects in engineering schools.

Over a period of a number of years he spent three or four months every other year traveling throughout Europe to study the operation of several famous manufacturing organizations noted for their high standards in employer-employee relationship.

During these travels he became intimately acquainted with the leaders in science and engineering in the principal research centers throughout the world.

General Radio Company

The General Radio Company was incorporated in Massachusetts in 1915 by Mr. Eastham and three associates with a capitalization of about thirty thousand dollars and a total force of less than a dozen people. Settling down after a considerable expansion to meet the needs for its products in the First World War, the Company has had a slow and steady growth up to the present time when there are over four hundred skilled employees, and an annual sales volume of of five-million dollars. This volume is limited now by available plant facilities and skilled manpower. During the First World War the Company produced large quantities of radio equipment for the Army and Navy. During this War the Company is supplying the armed services with large quantities of electronic test equipment. It is the largest supplier of this class of

material among the United Nations, and its entire output goes directly to the war effort.

Through Mr. Eastham's foresight General Radio Company has made a number of contributions to the technical advance of the communications industry:

Radio Communications and Broadcasting

- The first specialized wavemeters for the measurement of broadcast frequency.
- The first quartz crystal to control the frequency of a radio transmitter.
- The first instruments for the quantitative measurement of broadcast-station performance.
- The first high-quality transformer for broadcast receivers.
- The first standard-signal generator for the measurement of the performance of radio receivers.
- The first quartz-crystal controlled primary standard of frequency.

Telephony

- The first beat-frequency oscillator for audio-frequency testing and for rapid measurement of the transmission characteristics of telephone systems.
- The first copper-oxide type voltmeter indicator and output power meter.

Electrical Laboratory Equipment

- Many types of generalized and special-purpose bridges for the precise measurement of resistance, capacitance and inductance over a wide range of frequency and other varying parameters.
- The first commercial wave analyzer.
- The first cathode-ray oscilloscope.
- Special-purpose amplifiers and oscillators.

Industrial Instruments

- Equipment for the measurement of acoustic noise and vibration.
- The first commercial electronic stroboscope.

In addition to the wide variety of laboratory and measuring instruments mentioned above, the Company, and particularly Mr. Eastham, have developed many ingenious parts and accessories which greatly facilitate the design, construction and use of laboratory equipment. One development that has found many applications in widely diversified fields in the Variac transformer originated by Mr. Eastham and first made commercially at General Radio.

In the present War the efforts of the engineering staff of the General Radio Company have been largely devoted to the development of new secret devices for use by the armed forces.

Contributions to the Present War Effort

As World War II approached, Mr. Eastham began to devote a large portion of his time to aiding and supervising research projects on secret military equipment. This rapidly became an absorbing interest and for two years he was on leave of absence from his company to the Radiation Laboratory of Massachusetts Institute of Technology for this work. When these projects finally reached fruition and combat equipment based on them reached the battlefronts, he returned to the General Radio Company and resumed the active direction of the engineering staff.

Technical Societies

In 1912 The Institute of Radio Engineers was organized to enable the engineers in radio communication to have their own technical society. Mr. Eastham has long been identified with the institute not only as a member but also as an active worker on a large number of

committees, a member of the Board of Directors and an officer. He became affiliated with the institute in 1913 and was made a Fellow in 1925. He served continuously on the Board of Directors from 1922 to 1941 when increased pressure of his war activities made it impossible for him to participate further in its affairs. He was Treasurer from 1927 to 1940.

In 1937 The Institute Medal of Honor was awarded to Mr. Eastham. The Medal of Honor was established in 1917 and has been awarded to twenty people. Included in the list of recipients of this Medal are such distinguished scientists and educators as: Professor E. H. Armstrong; Professor M. I. Pupin; Professor G. W. Pierce; Professor A. E. Kennelly; Dr. G. Marconi; Dr. Lee De Forest.

The eligibility for this award is:

"The Institute Medal of Honor is given in recognition of distinguished service in radio communication. It is awarded to one who has been responsible for an important advance in the science or art of radio communication. This advancement may be a single development or may be a series of developments which in the aggregate have resulted in substantial improvements in radio communication.

"The advancement may be a patented or unpatented invention. It may also be a theoretical analysis of a hitherto unexplained phenomenon of distinct importance to the radio art, though the application thereof may not be immediate.

"Further, the advance may be a new system of traffic regulation or control, a new system of administration of a radio company or the radio-communication system for military, transpiration or other organizations; a legislative program beneficial to the radio art, or any portion of the operating or regulating features of the art.

"The advancement for which this award is granted preferably must be completely and adequately described in a scientific or engineering publication of recognized standing and should have been actually applied to radio-communication problems. A development may be of recent origin or otherwise, and a series of developments may extend over a long period of years. Preference will be given to widely used and generally useful inventions."

The Institute Medal of Honor was presented to Mr. Eastham on May 12, 1937, "for his pioneer work in the field of radio measurements, his constructive influence on laboratory practice in communication engineering, and his unfailing support of the aims and ideals of The Institute."

Some indication of Mr. Eastham's active participation in the management of The Institute of Radio Engineers is shown from a list of committees upon which he has actively served:

Awards Committee -- 1931, 1935, 1939, 1942, Chairman 1929, 1941;
Admissions Committee -- 1937 to 1939, 1941 to 1942;
Committee on Bibliography: -- 1930 to 1931, Chairman 1932, 1934;
Constitution and Laws Committee -- 1930 to, 1931, 1933;
Nominations Committee -- 1930, 1932, 1936 to 1939, 1941,
Chairman 1929, 1935;
Committee for Organization of the Boston Section -- Secretary 1914;
Committee on Papers -- 1916 to 1917;
Committee on Revision of Constitution -- 1925;
Committee on Sections -- 1925;
Committee on Standardization -- 1927 to 1928;
Committee on Standards -- 1936 to 1938;
Committee on Wavelength Regulations -- 1918 to 1919;
Technical Committee on Electro-Acoustic Devices -- 1930,
Treasurer -- 1927 to 1940;
Member of the Board of Directors -- 1922 to 1941;
Secretary-Treasurer of Boston Section -- 1916 to 1932.

In addition to his long association with The Institute of Radio Engineers, he has been for many year a member of the following scientific societies:

American Association for the Advancement of Science (Fellow);

American Institute of Electrical Engineers (Member*);
Acoustical Society of America (Member);
American Physical Society (Member);
American Meteorological Society (Member).

Cambridge, Massachusetts

May 25, 1944

* Mr. Eastham was made a Fellow of the AIEE in 1946