

AUTO PHASE LOCK-IN AMPLIFIER



The Model LI-574A is an easy-to-operate low cost instrument featuring sensitivity of 10 nanovolts full scale, differential or single ended. The unit has dynamic range greater than 80 dB over a wide frequency range of 1 Hz to 100 kHz. Also included are dual phase sensitive detectors for measuring amplitude without phase compensation. Other important features are continuous frequency tracking plus simultaneous vector and analog outputs of amplitude and phase for automatic Bode and Nyquist plotting.

SYNCHRO-TRACK LOCK-IN AMPLIFIER



This precise instrument, the Model LI-575S, features the heterodyne technique to eliminate harmonics, and high impedance inputs to permit low noise measurements. It features 100 dB dynamic range and 100 nanovolts full scale sensitivity over the 0.5 Hz to 200 kHz frequency range...without changing boards. The unit also provides an auto correlation mode that locks on to the input signal for synchronization, eliminating the need for a reference signal.

DIGITAL BOXCAR INTEGRATOR



The Model BX-531 is a microprocessor controlled GPIB compatible instrument offering simple, dual channel operation and high resolution over the 75 ps to 5 ms range triggered at ultra low rates. It features true digital averaging with single and multipoint signal processing as well as baseline sampling for minimum drift. Digital techniques eliminate duty factor limitations, while learning time problems are minimized by multiple samples/trigger.

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WILCOX

At home and wherever he traveled, he always made time for musical events. At the request of his family, Stanford University has created the John Marsh Wilcox Fund in his memory, dedicated to the acquisition of library materials in solar-terrestrial physics.

PHILIP H. SCHERRER
Stanford University

Frank G. Dunnington

Frank G. Dunnington, professor emeritus of physics at Rutgers University, died with his wife, Frances, in an automobile accident on 1 July 1983, near his retirement home in Florida. He was 80.

Born in Colorado Springs, Dunnington graduated in electrical engineering at the University of California, Berkeley, in 1929. His PhD in physics in 1932 was also from Berkeley. He devoted the following few years, as post-doctoral fellow at Berkeley and Caltech, to measuring e/m with high precision by a method suggested by Ernest O. Lawrence.

Dunnington joined the physics department at Rutgers in 1937, spent the years 1941-46 on radar research as a staff member of the MIT Radiation Laboratory, and returned to Rutgers after the war as chairman of the physics department. Largely through his efforts, Rutgers established a major research-oriented physics department. Almost overnight, the number of positions in physics was more than doubled, significant funds were made available by the University for research programs in low-temperature physics and magnetic resonance, and one of the first research contracts with the Office of Naval Research was negotiated.

With graduate students, Dunnington continued work on fundamental atomic constants, now including h/e . His interests later turned to radiation

science, and he served, by appointment of the Governor of New Jersey, on a number of advisory panels and commissions for establishing state standards in radiation safety. At the time of his retirement from Rutgers, he was director of the Radiation Sciences Center.

For his 1937 paper on e/m (*Phys. Rev.* 43, 475), Dunnington took extraordinary measures to ensure that he did not know while taking measurements whether they were coming out "high" or "low." The numerical value for e/m depended on a certain angle; a shop technician made random turns of a crank and thereby set the zero for that value before measurements were started. Only after all data had been recorded, the apparatus had been dismantled and the paper written (save for the last sections), was the critical angle measured and numerical value for e/m computed. Dunnington's method might well serve as a model of impeccable objectivity.

RICHARD T. WEIDNER
Rutgers University

F. Russell Petersen

F. Russell Petersen, a physicist at the National Bureau of Standards, died on 7 December 1983 following open heart surgery.

He was born 21 August 1930 in DeSmet, South Dakota, and received his BS degree from South Dakota School of Mines and Technology in 1952. After serving in the US Navy during the Korean War, he attended Berkeley, receiving his doctoral degree in physics in 1961.

Petersen joined the National Bureau of Standards as a research physicist in 1961. He designed, built and tested the first hydrogen maser at NBS. From 1969 to 1972 he worked with stabilized CO₂ lasers and assisted in the measurement of their frequencies. This work

PETERSEN



led to a new value for the speed of light and also to new rovibrational constants for CO_2 that served as the foundation for international laser frequency measurements. Subsequently, he expanded frequency-synthesis techniques covering the far infrared to the visible regions of the spectrum. His work in infrared molecular spectroscopy, using these new synthesis techniques, is unsurpassed in accuracy and resolution. Many of the molecular transitions he measured are used as secondary frequency and wavelength standards in the infrared. In 1982 he was coleader of the team that directly measured visible frequencies and thereby gave impetus to the recent redefinition of the meter.

KENNETH M. EVENSON
DONALD A. JENNINGS
JOSEPH S. WELLS

National Bureau of Standards

Harold Jacobs

Harold Jacobs, born in 1917, received a BA degree in chemistry from Johns Hopkins University in 1938 and MA and PhD degrees in physics and education from New York University in 1942 and 1945.

From 1942 to 1945 he was employed by RCA, Lancaster, Pennsylvania, as a research and development physicist. Subsequently he worked for Sylvania Electric Company, Kew Gardens, New York, and in 1949 joined the US Army Electronics Research and Development Command, Ft. Monmouth, New Jersey, as a research physicist. Except for a brief period in 1955 with CBS Laboratories, New York, he spent the rest of his career at Fort Monmouth until his death on 24 December 1983.

Jacobs was an instructor in the electrical engineering department at Polytechnic Institute of Brooklyn from 1946 to 1950. In 1957 he joined the faculty of Monmouth College, West Long Branch, New Jersey, and set up that school's department of electronic engineering. For the rest of his life he was associated with the College, serving as chairman of the electronic engineering department until 1978, and subsequently as professor of electronic engineering.

Jacobs wrote his PhD thesis on disassociation energies of surface films of oxides. His research efforts, which produced more than 20 patents, concerned silicon carbide research, lasers and quantum electronics, microwave semiconductor devices, millimeter wave devices, microminiaturization of electronics, optical masers and thin films.

KONRAD FISCHER
Monmouth College □

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