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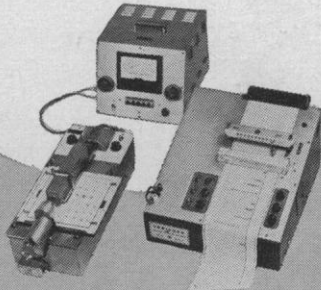
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Electron microprobe has a resolution better than $1\ \mu$, which makes it ideal for determining elemental composition in minute areas of samples. The highly focused $1\text{-}\mu$ beam of electrons excites the surface to emit its characteristic x-ray spectrum which is analyzed by dispersive (crystal spectrometer) or non-dispersive detector systems. The high voltage supply is continuously variable from 0 to 50 kv. At 30 kv and 100 μ amp the ripple is less than 0.01 percent peak to peak. A micro-ammeter monitors the sample current, and terminals are provided for a recorder. Electron optics include: a biased gun with an external bias control, two magnetic lenses, and a magnetic beam alignment system consisting of two sets of deflection coils with control panel adjustments and a meter for gun emission current. The direct current filament supply is controlled from the panel and a meter indicates relative filament life. Filament replacement takes less than 15 minutes. The electron beam impinges on the sample at right angles to its surface and has a depth of focus of $20\ \mu$. The light optical system is binocular with the reflecting objective lens having a resolution of $1\ \mu$ and the eyepieces affording up to $300\times$ magnification. The Norelco electron microprobe analyzer has four x-ray parts so that various combinations of vacuum- or air-path goniometers may be used. Each vacuum goniometer will scan all elements from magnesium upward without changing crystals. Speci-

men stage accommodates a sample of 1-inch diameter by $\frac{5}{8}$ inch thick, with space for standards. Five minutes are required for sample change. Table translation is controlled by micrometers calibrated in 0.0001 inch. Synchronous scanning speeds of 12 to 625 μ /mm can be obtained for the specimen stage. Vacuum system provides an electron optical system and sample chamber operating pressure of $10^{-1}\ \mu$ -Hg and x-ray optics pressure of 100 μ . Air may be admitted to the sample chamber while x-ray optics maintain vacuum. Pulse height analyzer has variable channel height of 5 to 100 volts and window width of 1 to 32 volts, with pulse width of 2 μ sec. Scaler has total capacity of 400,000 counts and resolving time of 0.5 μ sec.—R.L.B. (Philips Electronic Instruments, Dept. S831, Mt. Vernon, N.Y.)

High-voltage power supply (type HA 300) provides direct voltages from 50 to 300 kv. The device is basically a self-excited oscillator, operating at 40 kcy/sec, that feeds a multi-stage dry-rectifier cascade. Output voltage is produced in 10 steps with overlapping continuous fine adjustment. Maximum output current is approximately 1 ma. Polarity-reversing switches are provided. Short-term voltage stability of the power supply is said to be 10^{-4} ; drift over 1 hour, less than 10^{-3} ; and stability to line fluctuations of ± 10 percent, 10^{-4} . Stabilization is obtained by measuring the output with a series of precise resistors and comparing the measured signal with a reference voltage. The resulting error signal, after amplification, controls the cascade oscillator. In case of short-circuit, the discharge current of the cascade capacitors is limited to a safe level by protective resistors. If the oscillator tube becomes overloaded, a cut-off with a short delay shuts off the power supply.—J.S. (Carl Zeiss, Inc., Dept. S796, 444 Fifth Ave., New York 18)

Permanent magnet manual, PM-200, presents 40 pages of information on the theory, characteristics, design, and application of permanent magnets. The manual contains sections on the theory of magnetism, characteristics of magnetic materials, energy and permanent magnets, magnetic stability, and a discussion of the various types of magnetic materials, including the Alnicos, Lodex, platinum-cobalt, and hysteresis alloys. Sections on magnetic design provide formulas for determining length, area, and flux density; design limitations; testing of permanent magnets; and a glossary of magnetic terms and symbols. Featured by the bulletin are Alnico and Lodex demagnetization curves, energy curves, d-c magnetization curves for various materials, and tables listing the magnetic and physical properties of commercial permanent-magnet materials.—J.S. (General Electric Co., Dept. S807, Schenectady 5, N.Y.)

Digital Q meter (type 71A) displays the results of measurement in digital form in the Q range from 0 to 999. The instrument can also be used as a limit meter with preset switches permitting selection of Q limits throughout the entire range. When used in this way, panel-mounted pilot lamps indicate over and under status for each measurement. Frequency range of the instrument is 10 kcy to 1 Mcy/sec. A lower frequency range can also be provided. Test voltages are selectable in ten steps from 10 mv to 10 volts and inductance range is $10\ \mu$ h to 1 h. Accuracy is said to be ± 2 percent or one unit of Q , whichever is greater. The measurement process is completed in less than 1 sec.—J.S. (J-Omega Co., Dept. S848, 2278 Mora Way, Mountain View, Calif.)

Cryogenic thermometer measures temperatures of such materials as liquid oxygen and liquid nitrogen in the range of 76° to 91°K . The sensing element is a thermistor probe which is one leg of a voltage stabilized bridge system. This bridge is balanced by adjusting a variable resistance on the front of the instrument until the sensitive galvanometer is nulled. Temperature is read directly in digital form on the face of the potentiometer and is readable to 0.01°K with an accuracy of 0.05°K . Probe size is $\frac{1}{2}$ by 8 inches but other sizes are available. The case measures 6 by 9 by 5 inches.—D.J.P. (Numecc Instruments and Controls Corp., Dept. S851, Apollo, Pa.)

The material in this section is prepared by the following contributing writers:

Robert L. Bowman (R.L.B.), with the assistance of Denis J. Prager, Laboratory of Technical Development, National Heart Institute, Bethesda 14, Md. (medical electronics and biomedical laboratory equipment).

Joshua Stern (J.S.), Basic Instrumentation Section, National Bureau of Standards, Washington 25, D.C. (physics, computing, electronics, and nuclear equipment).

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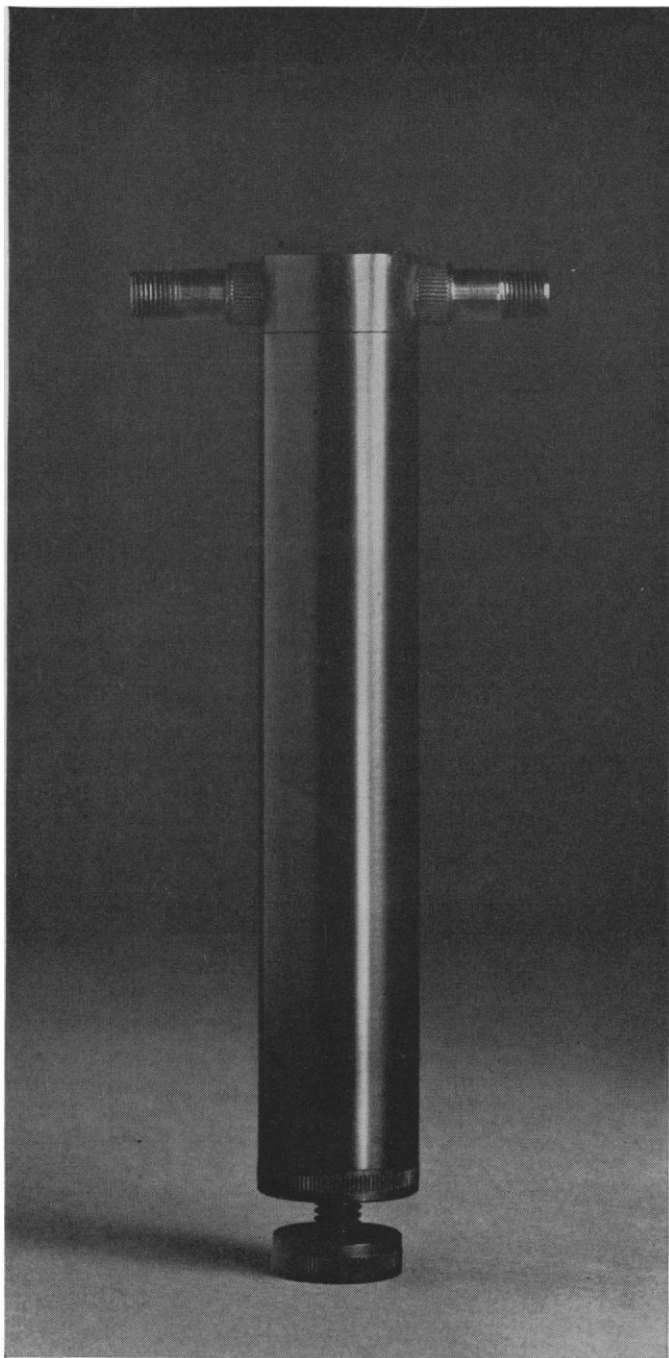
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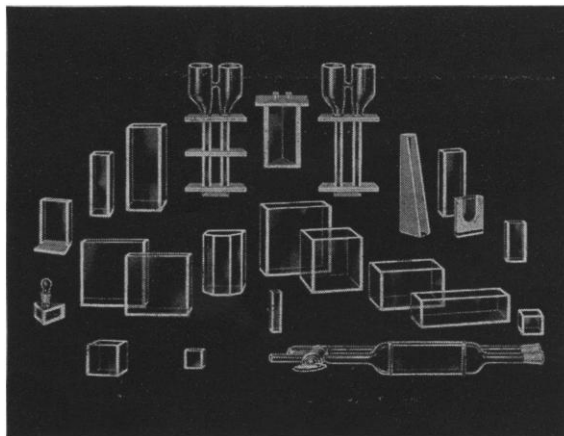
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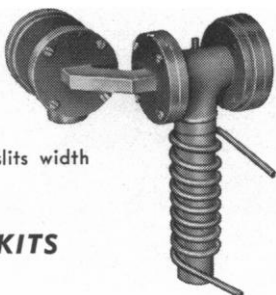
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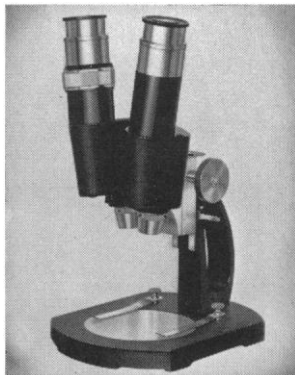


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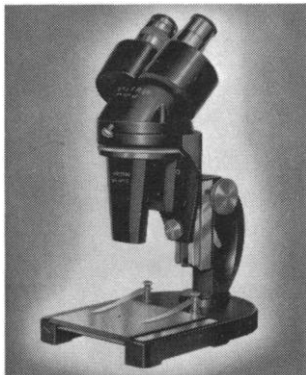
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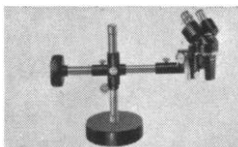
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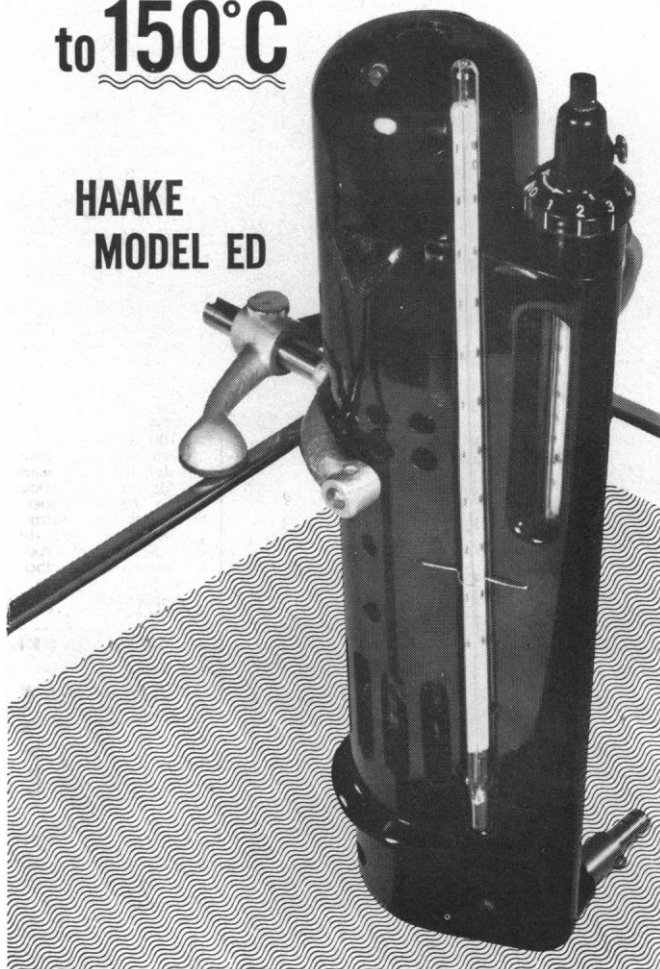
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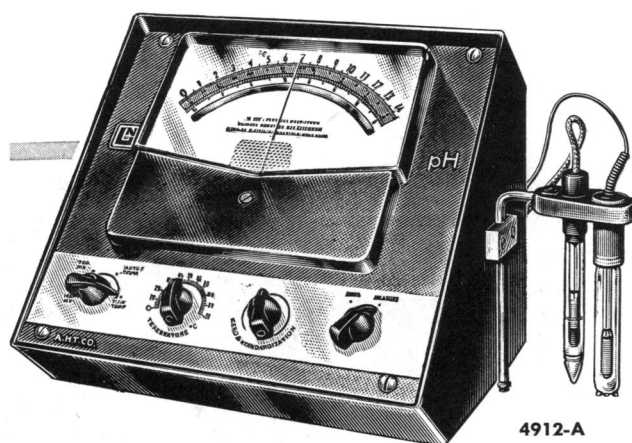
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