**Electronic Analog Computer**
Before digital computers were common, the quickest solution to differential equations was by simulation on devices such as this.

An equation is “wired-up” on the patchboard by connecting various parts that can do calculus (integrate and differentiate) or do simple arithmetic such as digital CPU’s do nowadays (add, subtract, multiply, etc.).

Add x to y: \( x + y \)

Multiply x by y: \( x \cdot y \)

Integrate \( x+y \): \( \int (x+y) \, dt \)

Differentiate \( x \): \( \frac{dx}{dt} \)

Examples of differential equations simulated by “wired-up” loops:
\[ \dot{y} = -\gamma y \quad \text{(decay equation)} \]
\[ \dot{y} = -2\Gamma \dot{y} - k \, y \quad \text{(oscillator equation)} \]