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The story behind a photo

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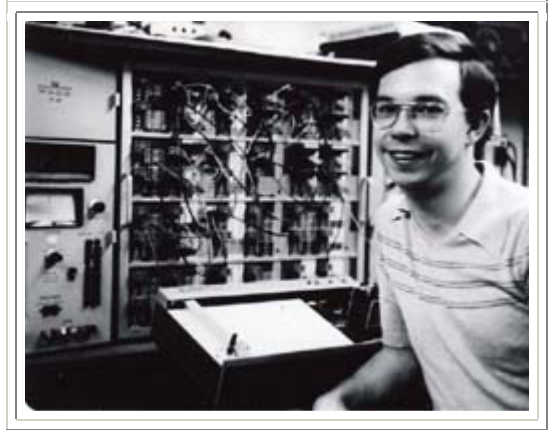
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The story behind a photo

Editor's Note: Looking through some old photo files in the University Communications office, we found the picture at left of Rich Cebula from his IWU student days. Curious, we wrote him asking to explain what device was shown in the background of the photo. The image sparked some fascinating memories for Cebula about working on early computers at the University. He wrote back the following:



I'd completely forgotten having my photo taken. In this photo, probably taken in 1976 or 1977, I am sitting front of a analog computer, a device which really fascinated me. You might ask what is an analog computer. To that end, I've gone to the Internet for some material:

"Analog computers are based on principles completely different from digital computers. Problem variables are represented by electrical voltages which can vary continuously within a certain range, usually -10 to +10 volts for a transistor-based machine. Electronic circuit modules allow the variables to be added, integrated (with respect to time) and multiplied by a constant. This makes it is possible to solve a system of ordinary linear differential equations by properly combining a number of adders, integrators, amplifiers and potentiometers using flexible chords and a patch panel."

(<http://www.science.uva.nl/faculteit/museum/AnalogComputers.html>)

"An analog computer...is designed to process data in which the variable quantities vary continuously. It translates the relationships between the variables of a problem into analogous relationships between electrical quantities, such as current and voltage, and solves the original problem by solving the equivalent problem, or analog, that is set up in its electrical circuits. Because of this feature, analog computers were especially useful in the simulation and evaluation of dynamic situations, such as the flight of a space capsule or the changing weather patterns over a certain area."

(http://www.encyclopedia.com/html/section/computer_AnalogComputers.asp)

Back in 1970s at IWU, analog computers were a great teaching device that allowed students to solve differential equations relating to physical processes — for example forced, damped, harmonic motion. The output of the computer (solution to a problem) was graphically presented; note the pen plotter in the photo. We programmed by the computer by setting up the electrical equivalent of the problem to be solved, and then could vary the parameters associated with the problem (e.g., the forcing function, damping constants, etc.) and immediately see the impact of these variations on the solution to the problem at hand. IWU's analog computer was a wonderful visualization tool, especially for those of us who, like me, were mathematically challenged! — Rich Cebula