Pushpa Gothwal, Arm simulator for blood pressure measurement, M. Tech. Thesis, Department of Electrical Engineering, Indian Institute of Technology Bombay, June 2011.

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Abstract: Arm simulator is a device for simulating behavior of the arm for testing and calibration of a noninvasive blood pressure (BP) meter. The project objective is to develop an arm simulator for auscultatory as well as oscillometric methods of BP measurement over full clinical range of pressure, heart rate, and arrhythmia. It is designed using a 16-bit microcontroller with on-chip ADC and DAC. It has four keys and graphical LCD for setting the simulation parameters including the heart rate, systolic pressure, diastolic pressure, arrhythmia, and pulse volume. The Korotkoff sounds and oscillations in the cuff are generated based on the set parameters and in response to time-varying pressure in the cuff as dynamically sensed by a pressure sensor. In addition to its use for testing and calibration of a non-invasive blood pressure meter, it can be used as a teaching aid for correctly using a blood pressure meter, particularly in the cases of unusually low BP or arrhythmia.