

Abstract Submitted  
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**Instrumentation for diode laser spectroscopy using 32-bit micro-controllers and a Nexus 7 Android tablet**<sup>1</sup> EDWARD EYLER, University of Connecticut — Last year, I described a low-cost ramp and timing generator using a 32-bit microcontroller, connected via USB to an Android tablet that provides a bidirectional touch-screen interface. I have since developed several additional designs to support experiments involving diode laser spectroscopy and cold atom manipulation.<sup>2</sup> One circuit card can be used either as a high-resolution temperature controller or as a dual high-voltage driver for PZT positioners. A second provides a flexible user interface to commercial laser current driver modules, with support for floating ground connections. A third supports a pair of inexpensive rf frequency synthesizer chips (ADF4351) that are usable from 35-4000 MHz. A fast rf switch provides numerous options, including phase-coherent frequency shifting at MHz rates for high-bandwidth laser stabilization and studies of polychromatic optical forces. Additional circuits for laser frequency locking are under development. All of these devices are controllable from a Google Nexus 7 tablet, which is inexpensive yet has graphics processing speeds that allow seamless real-time updates of charts and oscilloscope-like displays.

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<sup>2</sup><http://www.phys.uconn.edu/~eyler/microcontrollers/>. See also E.E. Eyer, RSI **82**, 013105 (2011).

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