Abstract Submitted
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Powerful low-cost laser lab instrumentation using 32-bit microcontrollers and an Android tablet interface[1] EDWARD EYLER, University of Connecticut — Recently, our laboratory has developed several homemade instruments based on 16-bit microcontrollers.[2] Since then, powerful 32-bit microcontrollers have become available, often including host-mode USB interfaces. Concurrently, Android-based tablets with high-resolution graphical displays have become commonplace. With appropriate programming, some tablets can communicate via USB, allowing them to serve as bidirectional touch-screen interfaces. I will describe ramp and timing sequence generators with resolution up to 12.5 ns that can be constructed with very little cost or effort, by making minor additions to commercial development boards. With these instruments, a graphical tablet interface is used mainly for parameter entry, but it is even more useful as a data display for applications such as laser frequency locking or signal monitoring. To minimize programming for the Android devices, my approach is to develop just a few general-purpose "apps" that can operate a wide range of instruments. When the USB interface is connected, the microcontroller informs the tablet of its display requirements. This arrangement can eliminate the need for dedicated computers, custom data entry units, or oscilloscopes.

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[2]E.E. Eyler, Rev. Sci. Instrum. **82**, 013105 (2011).

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