Music Box

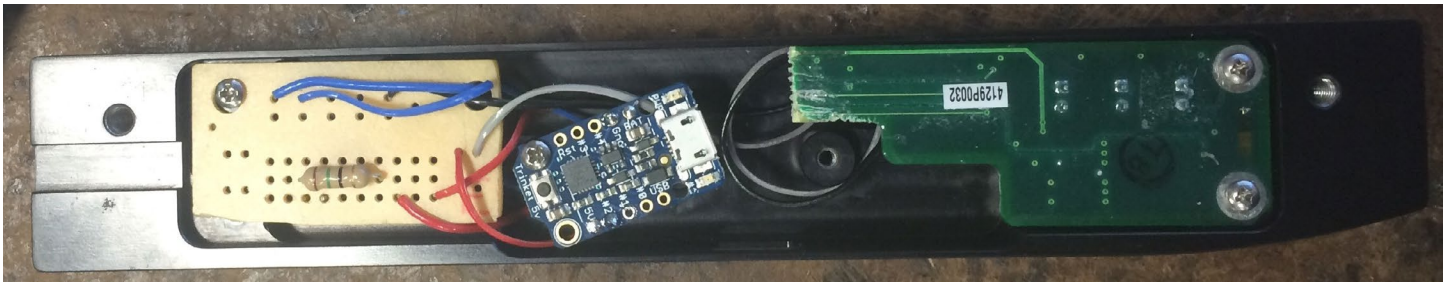
by Evan Cook

For adults, security is knowing that the door is locked, that one's valuables are safe, that one has a safety net in case trouble arises. But to children, security is a stuffed animal, a night light, or assurances that there are no monsters under the bed.

Music Box is an exploration of what security means, juxtaposing the adult and adolescent connotations by turning an object designed for physical security into a device capable of simple musical sequences.

Music Box uses a small microcontroller that activates the Blackboard SE3/CS card reader's "valid card swipe" LED and electronic buzzer according to a user-programmable sequence of musical notes. The vast majority of the electronics fit into the body of the card reader, only a 9V battery and two switches are enclosed in the external plastic container.

My greatest hope for *Music Box* is that it prompts debate over the impact of electronic waste in a time of enormous technological advancement.
The Environmental Protection Agency calculated in a 2011 paper that "About 70% of the heavy metals (including mercury and cadmium) found in landfills comes from electronic equipment discards. These heavy metals", the EPA also notes, "...can contaminate groundwater and pose other environmental and public health risks." I strongly believe that creative repurposing of electronic waste materials can serve as an exercise in sustainability and environmental stewardship but also as a source of novel educational material for STEM and arts education.



An internal view of *Music Box.*
Pictured left is added power and signal routing (tan, far left) and microcontroller (center, blue).
Pictured right is original card reader circuitry, home to the native buzzer and LED. (green).